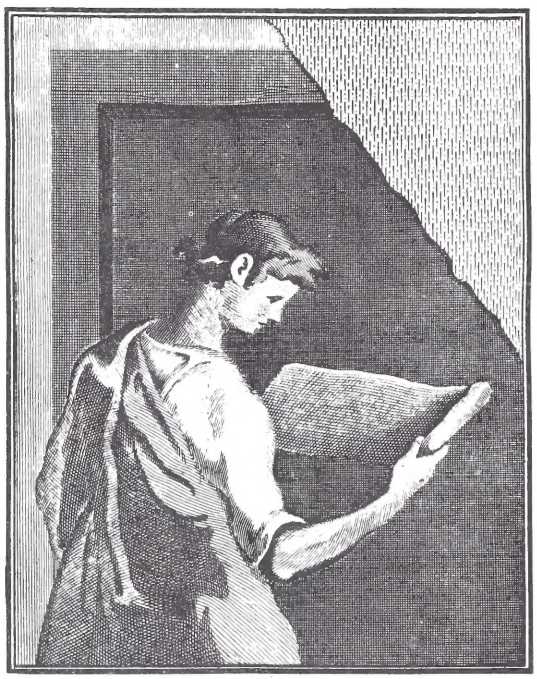
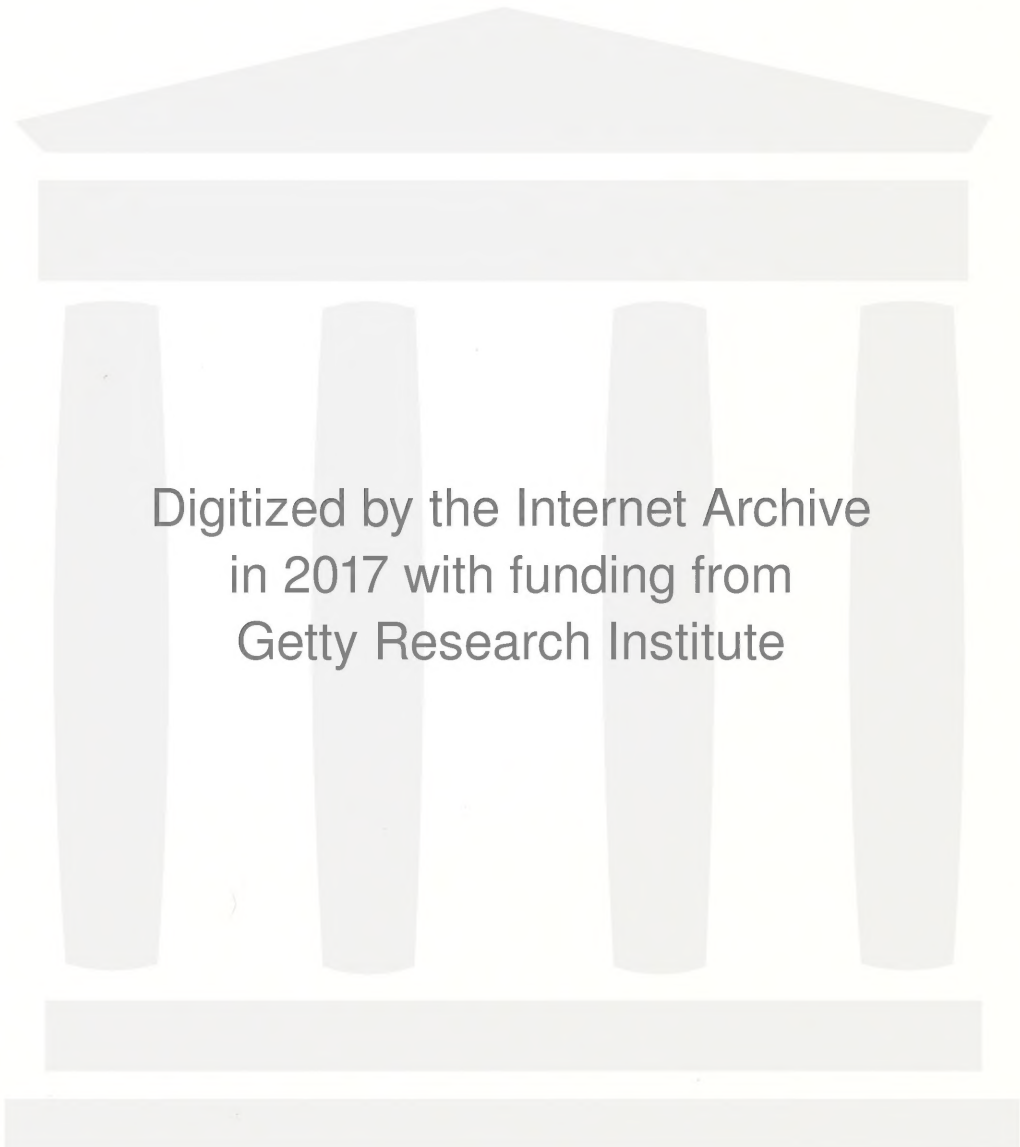


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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

EDITED BY GEORGE SHADBOLT.

VOL. VIII.

LIVERPOOL:
HENRY GREENWOOD, 32, CASTLE STREET.
LONDON:
E. MARLBOROUGH & CO., AVE MARIA LANE; HORNE & THORNTHWAITE, 123, NEWGATE STREET
EDINBURGH: JAMES WOOD, 130, GEORGE STREET.
DUBLIN: McGLASHAN & GILL, 50, UPPER SACKVILLE STREET.
PARIS: GEORGE FOWLER, 6, RUE MONTPENSIER. NEW YORK: E. ANTHONY, 501, BROADWAY.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 133, Vol. VIII.—JANUARY 1, 1861.

With the commencement of the New Year we undertake the representation of a materially enlarged constituency—the City of Glasgow and West of Scotland and the Bradford Photographic Societies having honoured us by selecting this Journal as their official organ. We shall endeavour to convince the members of each Society that they have not misplaced their confidence. Union is strength; and it is impossible for so large a number of intelligent experimentalists, clever manipulators, lovers of art, and leaders in science, as those who give the result of their labours to the world through the medium of our pages, to be engaged in the pursuit of one common object without making important advances, and opening up new fields for research.

Unanimity of pursuit does not necessarily mean unanimity of opinion; but, fortunately, this is no bar to kindliness of feeling, which in its turn presents no hindrance to freedom of discussion—a *sine quâ non* to anything like progress. It will therefore be our aim to encourage fair comment upon all matters photographic, as we have heretofore done, giving free scope to all to express their views, the only restraint imposed being the invariable adoption of reasonable courtesy of language, a restraint which we do not apprehend many of our contributors are likely to transgress; and should it on rare occasions happen that any do so, in the ardour of discussion, it must of course be our task to interpose, in order to prevent the infliction of a wound, or to heal one if our vigilance be eluded.

In taking a retrospective glance at the occurrences of the past year, so far as they affect photographers, we cannot omit congratulating them upon very decided advances in several directions, which, if they do not stand so prominently forward as some that have been effected at earlier periods of photographic history, are not improbably less conspicuous only because *those* had the advantage of a *less crowded background* than *these* can ever enjoy—an advantage that most of our professional portraitists will readily appreciate: there was then far less to distract the attention of the looker-on than now.

In the first place, let us observe what is the condition of the various Societies established for the promotion of our art. We think that upon the whole it may be regarded as satisfactory. If the meetings of the Parent Society have not been quite so numerously attended as of yore, this is not surprising, nor does it necessarily evince any diminution of interest in the members; for it must be borne in mind that a few years back that Society was the only point of contact between photographers, and the amount of work to be accomplished was far greater than at present. Now, however, we have nearly a dozen Photographic Societies in existence (the survivors of a still larger number), which we may presume — adopting for the *nonce* Darwin's "law of natural selection"—are in a state of healthy vigour. Two out of the surviving number have come into existence during the past twelve months; and of those which have come to a premature end, we may mention the following, viz.:— The Photographic Society of Ireland, the Belfast Photographic Society, as also the West of England, the Nottingham, the Norwich, and the Dumfries Photographic Societies; and yet with all this mortality, a reference to our pages will prove beyond question that the amount of work performed has been greater during the year 1860 than during any corresponding space of time previously. We think, therefore, we are quite justified in asserting that the survivors are in a sound state of health.

The Art aspect of photography is one which offers much encouragement for perseverance in the course so steadily pursued by some of our most renowned operators; amongst whom we may mention the names (which we do alphabetically) of Bedford, Fenton, Frith, Ogle, Rejlander, Robinson, Rodger, Sedgefield, Woodward, Wilson, &c.; the last-named especially being pre-eminently successful in delineating some most interesting and picturesque subjects, of necessity demanding a minimum of exposure, in many cases only a small portion of a second of time. Although this statement does not appear to the ear alone to present any peculiar novelty, to the eye the case is far different; for Wilson of 1860 has materially advanced upon Wilson of 1859 in the "instantaneous" branch of photography —an additional decision and vigour of result being markedly perceptible.

The Scientific part has obtained a full share of attention; some obscurities have been cleared up, and altogether photographers are better able to assign a sound reason for many of their proceedings than has heretofore been the case. To the value of Mr. Hardwich's contributions to our pages our readers will accord a willing testimony. Our knowledge of the best methods of producing collodion of specific qualities is due principally, if not entirely, to him; and in all that relates to the chemistry of photography his authority is of the highest.

Amongst the important features of photographic chemistry to which our attention has been directed we must place the experiments of Mr. George Dawson, communicated through papers read at The North London Photographic Association, and which were undertaken with the view of testing the accuracy of some extraordinary statements promulgated by MM. Davanne and Girard, with reference to the theory of photographic printing, and which statements were completely and satisfactorily refuted; as indeed the French gentlemen have virtually admitted, though we regret to find that they did not make any reference to Mr. Dawson's labours, as would have been but just and graceful of them to have done.

Our Manchester friends have not relaxed in their ordinary career of progress; and, in addition to several matters of minor importance, we may cite the process of Messrs. Petschler and Mann as an introduction of peculiar interest.

The dry processes generally have undergone a pretty extensive examination and trial, and considerable success has been achieved by our Liverpool brethren in working the Rosin Process, originally suggested by the Abbé Despratz, and with which Mr. Corey especially has, so far as we know, taken the lead. A lady photographer, resident at Liverpool, has earned well-

deserved applause for her manipulation of the Fothergill process.*

A very considerable amount of attention has been devoted to the optics of photography, which is a subject decidedly increasing in favour, though there are comparatively but few persons yet sufficiently familiar with it to render it very popular. The demand for a lens embracing a number of qualities not compatible with one another is as brisk as ever, to say nothing of the unreasonable expectation of being able to procure that mythical *multum in parvo* one lens to do everything in the best manner. In order to gratify such demand, we fear that some opticians have been induced to produce a compromise against their better judgment, so that we have had no lack of novelties, or supposed novelties, in this direction. Among the former, we must not omit to particularise one that is unquestionably both novel and cleverly designed—we allude to Mr. Sutton's panoramic lens; but, at the same time, we do not anticipate for it any great amount of popularity, at least at present, because its use involves the employment of curved glasses, or else paper, as a support to the sensitive film; the former also precludes the possibility of focussing. Should we, however, at any time be able to discover some perfectly transparent flexible material, inexpensive, and not liable to injury by immersion in aqueous solutions, or by contact with alcohol and ether, then indeed, for a certain class of subjects, we may presume that the panoramic lens would stand a fair chance of being pretty extensively employed. It is to be regretted that its inventor was so injudicious as to claim for it qualities that, on examination, could not be maintained, and thus call down upon it an undue amount of discredit.

The subject of enlargement from small negatives has obtained no small share of attention and consideration. We would especially notice the communication made by M. Bertsch to the French Photographic Society, in which that gentleman pointed out the impossibility of insuring good definition in the enlarged image when the negative is illuminated by converging rays proceeding from an uncorrected convex lens, and suggested a method by which a condensation of light might be obtained, and the illumination effected by parallel rays. The objection referred to by M. Bertsch would undoubtedly exist to some slight extent, even if the condensing lens were made achromatic, or effected by means of a concave reflector, as suggested by us on a former occasion; but we believe that, in practice, this might be disregarded.

It would be unjust to conclude this part of our retrospect without calling attention to the valuable papers contributed at the early part of the year to this Journal by Mr. Grubb, M.R.I.A., and which will well repay re-perusal.

The very unfavourable summer has caused many photographers to consider the expediency of employing some kind of artificial light when the sun has declined to show his face; and, though considerable ingenuity has been displayed in the search, nothing practically available for commercial purposes has yet been found. We are not oblivious of Mr. Moule's photogen; but it is rather a light for printing purposes to which we allude, that important part of the professional photographer's work having been most interfered with by the inclemency of the season, notwithstanding which a fair share of first-class negatives were fortunately obtained.

The application of photography to book illustration has been too recently before our readers, with the specimens from Herr Pretsch's new surface-printing blocks, to need any extended notice; as also the details of Colonel Sir Henry James's photozincography, for the multiplication of maps and other documents. M. Joubert's processes for carbon printing on paper and vitrified photographic impressions upon glass not having been made public, we can do no more than mention them as being *faits accomplis*.

There is one process which we regret having been unable as yet to lay before our readers, not from want of the means, but from want of space. We mean Mr. Osborne's photolithographic process for the reproduction of maps and other subjects delineated by lines or dots, and similar in application to that of Sir Henry James, to which, however, it has, in our estimation, some superiority. In fact, we regard it as by far the best photolithographic process extant, and we hope shortly to find room for an account of it.

Photography, as an aid to astronomical science, has received further development at the hands of Mr. Warren De la Rue, especially during the late eclipse of the sun, as seen in Spain—of which phenomenon many valuable negatives were obtained, some establishing disputed points of considerable importance.

The production of an instrument for measuring the chemical power of light has not been forgotten; but a thoroughly useful actinometer is still a desideratum.

In apparatus of all kinds many ingenious and highly useful specimens have been laid before our readers by description, aided by illustrations, most of which were drawn from photographs of the originals; and our country and foreign subscribers have benefitted largely by the elaborate description of most that was worthy of notice in the "Letters to a Photographic Friend," published under the signature of "Simeon Headsman."

And now, feeling that we have occupied far too large a share of our space, we conclude, heartily wishing our readers prosperity and A HAPPY NEW YEAR!

IN consequence of the first Tuesday in the month falling on New Year's Day, the Council of the London Photographic Society has postponed the next ordinary meeting till Tuesday, the 8th inst., when a paper on *Lunar Photography* will be read by Mr. Fry. The contemplated *soirée* at King's College has also been postponed because of the very inclement state of the weather.

PHOTOGRAPHIC COMMENTS.

By T. F. HARDWICH.

No. XVI.

WE have at various times been requested to examine and report upon certain iodides not commonly used in photography, but supposed to possess advantages entitling them to more consideration. The first of these was the iodide of tetrethylammonium, offered by Professor Von Babo for iodising negative collodion. This iodide is so rarely met with that we anticipated some difficulty in obtaining it, and probably should not have succeeded in doing so had it not been for the kindness of a friend who had worked with Dr. Hoffman in his researches. It was stated to be more permanent in collodion than the alkaline iodides; but we did not find such to be the case; and as it requires an unusually large quantity of water in the spirits to retain it in solution, we had no hesitation in condemning it.

Next came the iodide of magnesium advocated by Mr. Mayall, in a paper read before the London Photographic Society, in which he concludes that it excels the iodide of potassium in stability. Iodide of magnesium is undoubtedly a better iodiser for collodion than iodide of tetrethylammonium, since it is far more soluble in anhydrous alcohol. This property, indeed, of dissolving easily in spirits free from water, and of never crystallising in the collodion, will recommend it; but our anticipations of its superior permanency were not realised, for on iodising two portions of the same plain collodion—one with iodide of potassium and the other with iodide of magnesium—we found the red colour to be developed in the latter as speedily as in the former.

Iodide of sodium we have also examined, and may observe with reference to it that, although less soluble in strong alcohol than iodide of ammonium or iodide of magnesium, it is more so than iodide of potassium, and hence is to be preferred. The only question is, whether the difference is sufficiently great to induce the manufacturers to disturb their present arrangements? for we must remember that large quantities of iodide of potassium are employed in medicine, and the purification of this iodide for photography is a more simple process than would be the preparation of a new and distinct iodide. Up to the present time we have not been able to obtained a commercial iodide of sodium which could be termed absolutely pure.

Iodide of arsenic needs only a passing notice. If used in collodion it would be added in minute quantity for the purpose of altering the colour of the negative. Bromide of arsenic is far

* Among our Correspondence in the present Number, in reply to a former correspondent, the lady amateur alluded to, under the signature of "S. H. G.," describes the formula with which she has been so successful.

better, according to our own experience; but we do not anticipate that the compounds of arsenic will be extensively employed.

Last of all may be mentioned the iodide of lithium, which Dr. Schnauss has lately put forward. Of this iodide also, as of the iodide of tetrethylammonium, the first thing we had to consider was how to procure it in a state of purity. In our deliberations the name of Mr. Morson, of Southampton Row, occured to us as having volunteered his assistance on a previous occasion, and we at once applied to him and obtained a crystallised sulphate of lithia. This, after ignition, was decomposed by an equivalent of iodide of calcium. The filtered solution was then evaporated to dryness *in vacuo* over sulpuric acid, and the residue was extracted by absolute alcohol. The iodide of barium would have been used instead of iodide of calcium, but on testing commercial iodide of barium we have found it to be alkaline from excess of baryta, which, although harmless in the case of an iodide to be used in the preparation of hydriodic acid, would interfere very much in collodion.

The experiments with the iodide of lithium were commenced three months since, and have now terminated. The result is that in our own judgment we must decide against this iodide; for not only is it expensive and difficult of purification, but it is also deliquescent and unstable. We do not find, as Dr. Schnauss asserts, that it remains in the collodion without much change after the first straw-yellow coloration due to the ether; but, on the other hand, we observe that the ethereal solution of pyroxyline steadily decomposes it week by week; so that after three months' keeping the collodion reaches a deep saffron yellow, verging on brown, and becomes limpid and slow in action.

What, then, is the explanation of these conflicting statements? We will endeavour to indicate it as far as possible. Probably three causes are concerned in the differences of opinion which prevail on the stability of some collodions after iodising. The first of these is *the presence of a bromide.* When unstable iodides are used in collodion, the free iodine accumulates in the liquid more rapidly than when iodides and bromides are conjoined. Many, not aware of this fact, have thought that such iodides as the iodide of calcium or magnesium, although more changeable than iodide of potassium in alcoholic solution, are less changeable in collodion; whereas the real explanation may have been that these deliquescent iodides, on account of their easy solubility, admit of being used with a larger quantity of bromide than can safely be added to collodion iodised with iodide of potassium.

Another reason for the differences in the rate of coloration of two collodions placed under similar circumstances as regards light and temperature, may be due to peculiarities in the ether and alcohol used. Pyroxylic alcohol, or wood naptha, possesses a property of absorbing a portion of free iodine with production of a colourless acid liquid. Methylated spirit of wine does the same, as also does methylated ether, as a rule. Further than this, we have lately found that even ether made from pure spirit will sometimes exhibit the same property; and in our laboratory is a quart of ether, not methylated, the bromo-iodised collodion prepared from which becomes of a deep saffron hue almost immediately on mixing, but by the following day regains its colourless condition.

A third point which must be taken into account in estimating permanency in iodised collodion is the nature of the pyroxyline. It will be found, independently of the temperature of the nitro-sulphuric acid, that when the diluted sulphuric and nitric acids are mixed in the proportions of 3 to 1, the pyroxyline will liberate iodine more rapidly from unstable iodides than when the same acids are mixed in equal bulks.

Hence, after reading the papers of Mr. Sutton, M. Liesegang, and Dr. Schnauss very carefully, we find ourselves at issue with them on this question. In our own experience we find but one mode of preparing a permanent collodion, viz., the use of iodide of cadmium. With any other iodide there is discoloration and ultimate loss of sensitiveness. Neither is this prevented by diminishing the quantity of ether and adopting the formula known as the "alcoholic." In our own developing-room two bottles of alcoholic iodised collodion have been standing for several months, and although one still remains of a pale yellow tint, the other, in which the pyroxyline and the ether and alcohol were of a different quality, has become brown. We have always found that the gradual liberation of free iodine in collodion is due to the pyroxyline more than to the ether, and that the only means of preventing it is to employ an iodide which scarcely admits of decomposition. If you procure a sample of any iodide, and find that it is already yellow whilst in the bottle, and that it becomes more so on dissolving it in alcohol, you may be sure that the collodion will lose its sensitiveness on keeping.

ON SOME OPTICAL PRINCIPLES INVOLVED IN THE CONSTRUCTION OF PHOTOGRAPHIC LENSES.

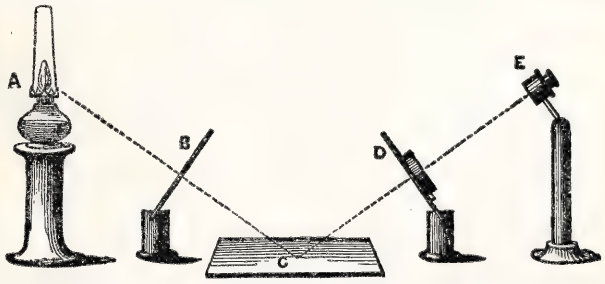
By William Ackland.

[Read before the South London Photographic Society, on Thursday, Dec. 20th, 1860.]

The subject I am about to bring before the notice of this meeting is one of considerable importance, and merits a very careful consideration by both the photographer and optician, and will consist of a description of the optical means employed in the manufacture of photographic lenses, under my superintendence, by Messrs. Horne and Thornthwaite; but before doing so, I should remark that I have but little that is new to offer you, my object being to bring together for publication certain means that are but little used, and perhaps unknown by many, so as to disseminate for the general good information that has been practically applied by myself for the last six years, and found thoroughly efficient.

In the construction of photographic lenses the first consideration is to obtain "optical discs," as they are termed, of first-rate quality, free from striæ, wavy lines, perfectly homogeneous, and properly annealed. To ascertain if any of these defects exist is an object of some importance in a pecuniary point of view, as, should they be detected on any after stage of the manufacture, the honest trader would at once reject it as valueless, and thus not only lose the original cost of the disc, but also the labour bestowed on it; whereas if these defects had been detected at the outset the prime cost of the glass would be his only loss.

In order to detect these defects, the disc is very carefully examined by looking through the facet polished on its edge by the maker, with a view to ascertain if any striæ exist. If none are visible it is next covered with a varnish, to render the rough surfaces more transparent, or is ground and roughly polished on both sides. The object of this is that any wavy lines or striæ that may be invisible by our first mode of examination may be thus brought to light. If a careful examination shows us nothing objectionable, the disc is next examined by polarised light, to ascertain if it is perfectly homogenous and carefully annealed. To accomplish this we require an apparatus similar to *fig.* 1, where A represents a



lamp used as a source of light; B a sheet of glass ground on one side, and employed here for the purpose of diffusing the light before it falls on the plate C. This plate C is made of ordinary glass, the under side of which is coated with black varnish or Bates's jet, and is so placed that the light from the lamp A, after passing through B, shall fall on it at an angle of about 33°. After falling on the plate, the rays of light are reflected in a polarised state towards a Nicol's prism, situate in the support at E. The plate of glass at E is merely for the purpose of supporting the disc of glass to be examined.

If we place the eye at E, we shall find that the amount of light reflected varies on rotating the prism, and that at certain positions of the latter none whatever is reflected, as what was before the field of view is now total darkness, the light having suffered what is termed polarisation.

The apparatus being thus arranged, so that no light is reflected if we place an imperfectly annealed piece of glass on the plate D, and again apply the eye so as to look through the prism E, we shall find, instead of darkness, that the glass is illuminated, and shows a rich and gorgeous display of the prismatic colours, and the more carelessly the annealing has been done, the more brilliant the colours; but if we introduce a disc of glass that has been properly annealed no colour is perceptible, and the field of view is totally dark as before its introduction.

This mode of examination frequently brings into view wavy lines and striæ that are perfectly invisible by ordinary light.

Having ascertained that the discs of glass are free from any defects, they are next handed over to the glass grinder; and those intended to form *convex* lenses are ground and polished in the usual manner, and are then ready for centering. The object of this is to render the lens perfectly circular, and to make the axes of the two spheres, of which the surfaces are segments, in the same straight

line; and much of the correct working of a lens depends on this being properly done. The mode of centering is well known, and consists in attaching the lens by means of pitch and a clinch to the mandril of a lathe, and whilst the pitch is still warm enough to be pliable, the position of the lens is changed by a pressure of the hand, or with a fragment of wood, till, by revolving, the mandril, as in turning any object seen by reflection on its outer surface, remains steady to the eye during the revolution. If this is not the case the workman by practice judges what is wanted, and either lowers or raises the lens on the pitch, or inclines it a little more or less, until by repeated trials the objects seen both by reflection and refraction remains stationary during the rapid revolution of the lathe. He then concludes that the lens is fixed centrally, that is, that the two axes coincide, and it only remains to cut it down to a perfect circle of the proper size.

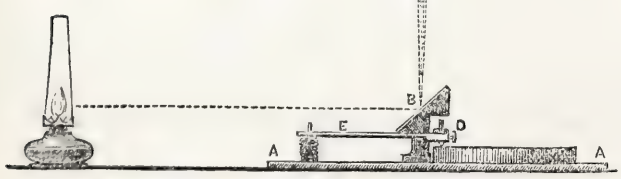
To effect this, the lens is left until the pitch is quite cold, and then the workman turns the lathe with his foot very rapidly; and being provided with a plate of copper, covered with coarse emery, moistened with water, he applies this at a fixed distance from the centre of the lens, so that the parts most distant from the centre rub pretty strongly against it. By these means the prominent parts are soon reduced. He then approaches the plate of copper a little more, and thus removes the next projecting parts; and so on till he has ground the rest of the prominent parts down, and produced a most complete circle, which must, when the lens is properly centered, be of equal thickness all round. The lens is now finished, and after removal from the bath, is washed with turpentine, to remove the adhering particles of pitch, and is then ready for use.

Concave lenses are usually centered in the same manner. But I must confess that, from the first moment I turned my attention to lenses, I saw that great difficulties must be experienced in properly centering a *concave* lens by this plan, more especially if one surface is nearly flat; and as the front lens of the portrait combination and the first surface of a view lens are both nearly flat, it was very important that some other plan should be adopted, and I devised the following one, which I have found to answer admirably in all cases.

The importance of centering a concave lens by some other and better plan than the one usually adopted will be apparent to any one who tests a few lenses by the plan I shall hereafter describe, as I venture to assert that out of every six portrait lenses that are imperfectly centered, five of that number will be found to be defective in the concave lenses; and most probably four of that number will show a want of accurate centering in the flint lens of the anterior combination.

The disc for a double concave lens, after being examined as before described, is first edged down to the size of the required lens in a manner exactly similar to that employed in edging down the finished convex lens, and is then removed from the lathe and ground perfectly level on both sides, and reduced to an even thickness all round.

To ascertain if one part is thicker than another, an instrument I have termed an "Indicator" is employed, the construction of which will be apparent by reference to *fig.* 2, where A represents



an iron base perfectly flat; above this is an axis working on centres, one of which is shown at C. This axis has attached to it two arms, into one of which, D (the shorter of the two), is inserted a screw, working vertically, and underneath the point of which the edge of the lens to be tested is placed. The other arm, E, extends backwards for a couple of inches, and has a spiral spring under it, so as to raise it, and thus to depress the arm, D, and keep it in contact with the lens under trial. Attached to the axis is a mirror, placed in an angle of 45 degrees. Now, it is evident that if we cause a beam of light to fall on the mirror, by using a lamp properly so placed that such beam of light will be reflected upwards to the ceiling of the room in which the experiment is tried, and that we may consider such a beam of light as an inflexible and prolonged arm, having an axis at C and a short arm at D, and that if we raise or depress the arm D the smallest fraction of an inch, such movement is instantly visible by the reflected image on the ceiling varying its position. Hence it is evident that if we place our flattened disc under the arm D, and then rotate it, that if the disc is of uniform thickness, the image on the ceiling will remain perfectly stationary; but if our disc is even the one-thousandth of an inch thicker on one side than the other, the varying position of the image will detect it with certainty. If the extreme delicacy of this instrument is found objectionable, we may dispense with the beam of light and mirror, and prolong the arm E some six or seven inches, and place before its end a divided scale, as a depression or raising of the arm D will cause a reverse movement of the arm E, and thus the uniformity on the thickness of the disc would be shown, but in a less accurate manner.

The disc of glass, now of uniform thickness, is next ground on a convex tool of the required curvature, until the spherical cavity formed extends to near the edge; but the workman is very careful to leave a slight ring of the previously flattened surface undisturbed. This circular annulus or ring is a guide to enable him to keep the axis of the curvation exactly at right angles to the surface of the disc; for should the ring be thicker at one side than the other, it is evident that the axis cannot be in its proper position, and must be corrected accordingly.

When the lens is correctly ground to the required curvature it is polished as usual, but needs careful examination from time to time to ascertain that the accuracy formerly attained is not destroyed by uneven polishing.

However careful a workman may be in grinding and polishing a lens, it often happens that at some stage of the process a particle of grit or emery will get on his tool or polisher, and scratch the surface so deeply that, in order to remove it, the circular ring must be entirely removed. When such is the case, the indicator must be employed from time to time during grinding and polishing.

Both sides of a double concave lens are treated in exactly a similar manner; but for the concavo-convex lens of a portrait combination we must proceed differently.

In this case the disc of glass, after testing as before described, is edged to the required size, and the convex side ground and polished in the usual manner. After this the disc is rendered of uniform thickness, and such thickness verified by the indicator, and the concave surface is then worked with the precautions before described.

I have thus shown the optical means employed to form each lens with accuracy. But we have still to guard against any errors that may arise from a defective brass mounting, or in imperfectly turned cells; and we must not consider our examination complete until we have ascertained that not only the lenses but even the brass mounting in which they are fixed is accurate. To do this is easy, and any errors can be instantly detected, whether caused by the glass grinder or the brass finisher, and even the defective surface or cell pointed out.

The plan I adopt was invented by Dr. Woollaston, and read before the Royal Society on the 13th December, 1821. The title of the paper is *On the Concentric Adjustment of a Triple Object Glass*, and in it the learned author says:—"Having in my possession a telescope with a triple object glass on 45-inch focus, made by Dolland in 1771, I have had a good opportunity of examining the central adjustment of the lenses, and have made trial of a method of correcting that adjustment which appears not to have been used for that purpose. When I ventured to take to pieces an adjustment that had stood the test of fifty years' trial with uniform approbation of its performance, those who know the telescope, and who know the difficulty of centering, seemed to consider it an act of rashness, which I was likely to regret; but, by the test I am about to describe, I felt confident that my object-glass was capable of improvement, and I rested my hopes of success on principles that seemed indisputable.

"When any bright object is viewed through a glass of this construction without an eye-glass, there may be observed at the same time as the refracted image a series of fainter images that are formed by two reflections from the different surfaces; and as the position of these images is dependent on the curvature of that pair of surfaces by which it is formed, they appear at different distances from the object-glass.

"Since the number of surfaces is six, the number of binary combinations of these surfaces is fifteen, and just so many images formed by reflection may be discerned.

"It is manifest that if the glasses be duly adjusted to each other, so that the axes are correctly coincident, then this series of images

must be all situated in the same straight line, and conversely, that any defective position may be immediately detected by a derangement of the line of images."

The author then goes on to describe the formation of the various images; and an engraving published with the paper in the *Transactions* of the Royal Society shows the displacement of certain of these images by one or other of the lenses being out of adjustment; and, in conclusion, states that the telescope, when finally adjusted by this plan, was so much improved that "the actual limit to its powers cannot be fully ascertained, excepting under such favourable conditions of the atmosphere as do but rarely occur."

In order to apply this to test our portrait lenses, all we have to do is to place a candle at a distance of about seven or eight feet, and then holding the lens in the hand, or supporting it on a stand, if we look through it we shall distinctly see fourteen of the reflected images, as shown in *fig.* 3, and of the comparative sizes there



given. If all these images are in one straight line we may pronounce such lens properly centered; but, if they appear scattered to the right or left, such lens is defective.

It may be mentioned that *fig.* 3 shows the images as formed when the front lens of the portrait combination is next the eye, and that to observe these images properly the eye should be placed at a greater distance from the lens, that its focal length, and also that the first image next the candle, is the one often out of its true place, in lenses otherwise properly centered.

I mention this last fact, as in many cases I have discovered that the surface here out of place is that of the front flint lens, and it is no doubt caused by the cemented pair of lenses not accurately fitting the cell, and the softness of the balsam having allowed the lens to drop a trifle after leaving the maker's hands. Such defects can be remedied, and the lenses much improved in action.

I have now, gentlemen, given you a rough outline of a few optical means found useful in the construction of lenses.

Of course, you are all aware that one part of this paper is a description of a plan that at one of our meetings I designated a "trade secret." How far I was justified in doing so I leave you to judge; but this much is certain, that the plan now described is unknown to many, and the worthy Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, who attacked me, was amongst that number.

It is true he had since been told something of the principle, which he designates a rough method; but when we find that, on looking through a portrait lens, there are fourteen reflected images *easily* seen, and that a fifteenth exists, whilst he states the number to be six, I think we may conclude he has never tried the plan, and that his assertions are mere hearsay.

However, as he states he will allow me to have the last word, I can only use his own expression, by saying, I will "let him down easily," and thus close the discussion.

Before sitting down, I may mention that, some years ago, and prior to my accepting the situation I now hold, I was occasionally employed by two importers to select into classes a very large number of French portrait lenses. In so doing, I made use of Woollaston's method to test the centerings; focussed a luminous speck, situated obliquely, to ascertain the amount each lens would cover; and, to ascertain the coincidence of the chemical and visual rays, I examined the state of the lens as to "correction for colour," by viewing the image of the luminous speck by a Ramsden eyepiece.

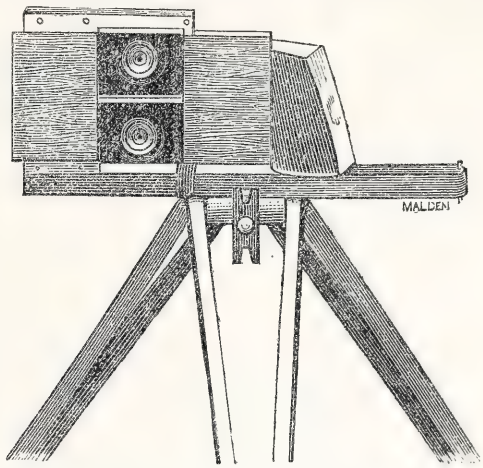
These examinations were rapidly made, and the lenses distributed into one of three classes. Those I considered fit for No. 1 class were sold at a comparatively high price, as first-rate lenses. To prove that the plan I followed was successful, I can with confidence state that not one of these lenses was ever returned as defective, or even complained of; and although my charge for making such selection was such as to pay me very handsomely, I think my services would have been made use of to this day had my time been my own to apply it for such purposes. I mention this to prove that Woollaston's plan is not to be considered either rude or complicated.

PHOTOGRAPHERS THEIR OWN ARTIFICERS.

By THOS. GULLIVER.

No. V.

MY camera is merely a square box of the required length for the focus of the lenses. I have a pair of Ross's single lenses 4½-in. focus: they are fixed on a sliding front. The camera slides on a mahogany bar 19 in. long by 3 wide, which is furnished with a brass tongue in the centre, working between a sliding jaw. This is attached to the camera-stand by a screw working in a slot, thus allowing for any angle up to 10½ in., and two negatives are taken at one operation on a plate 6¼ by 6 in.; or, by putting the camera on its



side, and screwing it to the stand, it becomes a binocular camera, and the two negatives can be taken one after the other. The camera is made of deal, varnished; the groove for the plate and borders at the back are of mahogany. A sun-shade, 2¼ in. deep, is fitted to the sliding front, and a cap made of pasteboard fits over the sun-shade. These are made moveable when required, in order to pack closer. Two pieces of hard wood are fixed to the bottom of the camera. A small brass tongue, screwed to one of these pieces, runs in a groove at the back of the sliding bar. This keeps the camera on, and causes it to run steadily.* The method of working it, and some further particulars, must be reserved for my next.

ON ART-PHOTOGRAPHY,

And how far Composition Printing is capable of Aiding Cultivation.

By C. JABEZ HUGHES.

[Read at the meeting of the South London Photographic Society, December 20, 1860.]

IN resuming the discussion of Mr. Fry's paper, *On Instantaneous Photography and Composition Printing*, instead of following him into the technical details of manipulation, I prefer to take a broad and general view of the subject, particularly that section in which he suggests the production of a higher order of artistic pictures by printing in portions from different negatives.

Hitherto photography has been principally content with representing Truth. Can its sphere not be enlarged? and may it not aspire to delineate Beauty too? All men love Beauty. The sentiment of Beauty is innate in us. It is not only a part of our nature, but one of the best parts. We have no evidence that any other creature on God's earth has the perception of Beauty but man. The poor savage, the dull boor, and the educated man—all love Beauty. The child loves Beauty; the youth and maiden dream of Beauty; the strong man toils night and day for Beauty, and the aged ones close their eyes and look with confidence into that bright world they are hastening to for the full realisation of all their disappointed hopes of Beauty. The mother sees Beauty in her babe; lovers adorn each other with a Beauty concealed from all other eyes. And there are different kinds of Beauty There is Material Beauty, Intellectual Beauty, and Moral Beauty. The love of Beauty is no narrow feeling: the man full of it cannot contain himself, but must communicate it to his fellows; and the ways of its expression are various. Some give utterance in "words that breathe and thoughts that burn;" others seize the rude clay and solid stone and carve enduring monuments; but the more general form of its expression is pictorial. Man is the only animal which makes pictures, and all men love pictures. The earliest form of writing is pictures; the only universal language is that of pictures. Earliest history records the existence of pictures, and the child's first passion is for pictures. Civilisation and pictures go hand in hand; and the more civilised men are the more they value them. "Man cannot live by bread alone," but must have pictures. Every art that man can invent

* A brass button at each end of the bar keeps the camera from running off.

is applied to increase the production of pictures. The Steam-engine, Printing Press, Electricity—all must help to produce pictures. The child's first lesson is from a picture-book. Dry science is made interesting, and fiction more fascinating, by pictures. The more man becomes educated the more he requires pictures, for education and pictures are indissolubly connected. The highest Art and deepest Science are concentrated on pictures: we paint them by Light, print them by Steam, and distribute by the Railroad.

If pictures, then, exercise so powerful an influence, how highly may we estimate the greatest picture-producing power ever devised—I mean our glorious Photography! What invention was ever more deeply appreciated, more fondly cherished, more devotedly cultivated, than this child of the sun? What art can boast in so short a time of so numerous a band of attached disciples? Others may have added more to our material wealth; but none have communicated so much pure and unalloyed good in aiding science, assisting art, and by the humble but potent aid of exchange of portraits, ministering to and keeping alive in every part of the globe those warm and holy feelings of affection which are the very base of our nature.

Our business to-night is not with the usual applications of photography. We seek the higher forms of pictorial representation, and wish to know whether the Artist-photographer may not, by the aid of the camera, as legitimately express his love of beauty as the poet by his poetry, the sculptor by his chisel, or the artist by his brush: the means are different but the end is the same.

Permit me, before proceeding further, to make a few distinctions to assist us in discussing our subject. I propose to divide general photography into three classes—Mechanical photography, Art photography, and, for want of a better term, High-Art photography.

Mechanical Photography will include all kinds of pictures which aim at a simple representation of the objects to which the camera is pointed, and will include not only all reproductions but the great majority of portraits and landscapes. Let it be understood that I do not mean the term *mechanical* to be understood depreciatingly. On the contrary, I mean that everything that is to be depicted exactly as it is, and where all the parts are to be equally sharp and perfect, is to be included under this head. I might have used the term *literal* photography, but think the former better. This branch, for obvious reasons, will always be the most practised; and where literal, unchallengeable truth is required, is the only one allowable.

Art Photography will embrace all pictures where the artist, not content with taking things as they may naturally occur, determines to infuse his mind into them by arranging, modifying, or otherwise disposing them, so that they may appear in a more appropriate or beautiful manner than they would have been without such interference. This class may easily embrace almost all subjects. In landscapes the artist may select the period of the year, the condition of weather, time of the day, point of sight, length of exposure, &c., as material agencies in beautifying his picture; the same in portraiture, by arrangement of light, *pose*, expression, presence or absence of accessories, &c.; also in the composition of pictures by the due attention to all the necessary parts, so as to form one harmonious whole.

High-Art Photography.—This distinction may appear presumptuous; but I feel a necessity for it to include certain pictures which aim at higher purposes than the majority of art-photographs, and whose aim is not merely to amuse but to instruct, purify, and ennoble.

If such distinctions as these be admitted, we can the more easily discuss the various kinds of pictures, and assign them each to their proper class. Our more immediate object is with what I propose to call art-photographs. With many of these productions we are quite familiar, particularly those of that true artist-photographer, Rejlander. The idea of producing art-photographs is not a new one: it is almost coeval with photography itself. In 1845, Mr. Mayall, then of Philadelphia, designed and executed a series of ten pictures, on daguerreotype plates, in illustration of the Lord's Prayer. This series was highly appreciated in America, and when exhibited in this country received high encomiums from the art-press. In 1848 he composed a series of six, illustrative of Campbell's *Soldier's Dream*. It is to be regretted that they were only on silver plates, as they were confined therefore to his own gallery, and the great merit they possessed known only to a few. Numerous other art-photographs he composed, particularly one very fine one, in illustration of the words—"And this mortal shall put on immortality." This work, for the fineness of conception and noble simplicity of execution, in my opinion, exceeds all that has yet been produced.

This gentleman, though he has precedence in point of time, has done little or nothing in this line lately; and it is to Rejlander we are mainly indebted for popular illustrations of art-photographs. Mr. Robinson has also produced some very superior productions of this class, of which his last one, the *Holiday in the Woods*, is by far the most ambitious, and by many considered his best. It is certainly the largest; but there is a deep pathos and feeling about his *Fading Away* that gives that picture a far higher place in my mind than any of his other productions. Rejlander occasionally, and Mr. Robinson often, uses more than one negative to produce their pictures. To describe this class of pictures a word has been coined, "Composition-photography." Now, I object to this term as descriptive of what I propose to call Art-photographs. It is not sufficiently definite, and is open to misconstruction; and, moreover, it is descriptive rather of the means taken to produce the picture than its nature when done.

I may be told, as doubtless I shall be, that "composition," in an artistic sense, means the operation of devising, arranging, modifying, and successfully carrying out the artist's conception. The idea may exist in the painter's mind; but the reducing to practice in a proper and harmonious manner the various parts required to form the picture, so that the idea conceived shall at last be adequately expressed, this operation—partly mental, partly physical—is what an artist will tell me is meant by "composition," and that photographs produced by such or similar means he would call "composition-photography."

Well, in an artistic sense, this is right; but as the word is for photographers, they cannot be expected to understand it in this refined and technical sense, but will attach to it the plain and literal meaning—a print *composed* from different negatives. Take a notable art-photograph, Rejlander's *Two Ways of Life*, and ask an artist if that is a composition-photograph? "Most assuredly," he will say; "as much so as any painting, and a very clever composition." Now ask a prosaic photographer is that a composition-photograph? and his reply will be—"Certainly; composed from ever so many negatives, and very nicely printed in."

Now that cannot be a very happy word where it is capable of conveying such different meanings of the one subject.

Again, take Lake Price's *Don Quixote in his Study*, or his *Roman Festa*, and ask the artist and the photographer—"Are these composition-photographs?" The artist will exclaim—"Yes! and fine ones!" while the camera-man will declare—"They are nothing of the kind: they are both from single negatives, and printed all at one time!" Here I fancy I hear the man with the black fingers exclaim to the artist—"What do you know about photography? Come here, and I'll show you something worth calling a composition-photograph! Here's a print, five feet square, composed of twenty-five negatives, and I'll defy you to tell where one ends and the other begins. They are taken from a large map. That's what I call a composition-photograph!" Artist (with knitted brow and violent manner): "That a composition-photograph!—it's no composition at all; mechanical drawing by sunlight—nothing else!"

This is sufficient to show that the term composition-photography is not definite enough, and that it will be difficult for the photographic mind to separate it from printing from many negatives. Indeed if we don't mind we shall get into trouble and confusion with this question of printing from many negatives, by allowing mechanical ingenuity to usurp the place of artistic skill. For my own part I do not like printing one picture from several negatives. There may be times where it cannot be avoided; but wherever possible it should not be done. Artistically speaking, it is false in principle; and photographically, it is a step in the wrong direction. Its tendency is to cripple art and degrade photography. It is making the conception of the artist depend on the skill of the printer. It is a confession of weakness on the part of both, by doing in fragments what is ultimately to be represented as if done as a whole. When an artist conceives a brilliant thought, and hastens to put it on canvas, how he sighs that he is obliged to work piecemeal—that he cannot, with one sweep of his brush, realise the thought in his mind. It is the proud boast of photography that it can do this. In depicting a portrait it does not begin with the head and go on with the hands, then put in the drapery, and finally the accessories: it works all at once—as a whole. This is the natural mode; and it was reserved for patchwork photographers to discover the method of taking the head on one plate, the body on another, and the feet on a third; and then, by printing them together, to produce a tasteless monstrosity. See yon lovely landscape of hill and dale, water and sky; how shall I proceed to depict it? Shall I first photograph the river, and then do the trees; next week take you hoary old castle, and some other time the distant hills and

sky; and then, by ingenious printing, fit and match them together as a child does its toy puzzle? Or shall I uncover my lens, and with one effort seize Nature with all her native charms, her local and general hues, her natural *chiaroscuro*, just as she now is, and as she never will be again? I fancy I hear some one say—"But you cannot get this natural harmony. You may secure the landscape but you lose the sky, or you get the sky and lose the landscape; and the argument now is, can we not print the sky into the landscape, or the landscape into the sky, and so make the photograph perfect?" That is exactly the question—can we do this? Let us hope we can. Let us try; but bear in mind, mere printing clouds into landscapes is not making perfect photographs. A fine photograph of clouds and sky is one of the most beautiful we can depict; but to join it on to a landscape without having a most tender regard for the nature of the subject, instead of raising the photographer to the rank of an artist, will only degrade him to the level of a mechanical printer. An outcry has justly been raised against white paper skies, but don't let us run into the opposite error of indiscriminately printing in clouds. No sky will ever harmonise like the one that existed when the view was taken. Let the efforts be, then, to take the normal and natural sky simultaneously with the landscape. In this direction lies the true progress of artistic landscape photography. Until we make further advances in our art we shall be troubled, especially in out-door work, with some objects reflecting more light than others; but let us exercise our ingenuity rather in devising means of giving short exposure to the sky and longer to the foreground, so that they may simultaneously be produced, than by tricks and dodges to print in another sky, which, under the best circumstances, can be but a sorry substitute for the natural one. Give me a landscape with no sky at all rather than with one that is not in harmony with it: for in the former case, though I may regret its absence, it does not prevent me enjoying what remains; but if the sky be not consonant with the rest of the scene it offends me by its impertinent obtrusion, and mars the pleasure I should otherwise have experienced. There is, at least, this negative merit about a landscape without a sky, that it permits the mind to supply any sky it pleases; and so carefully, though unconsciously, is the eye trained, that whatever sky the mind supplies is sure to harmonise with the picture.

But landscapes *may* be taken with the natural sky. Mr. Fenton has exhibited some. The late Mr. Archer took many, and very charming ones they were. But there is one class of subjects that seems to offer less difficulty—marine pieces (*waterscapes* I should like to call them, as distinguished from landscapes). Water always reflects light in nearly the same amount as the sky. In 1855 Cyrus Macaire showed many pictures of vessels at sea with the natural sky and clouds. We all remember Le Gray's famous sea piece, and the sensation it created. Mr. Kibble, of Glasgow, has taken an enormously large picture, with the sky and water and steam vessel all perfect, and *on a dry plate too*. Let us not forget these facts, for they show that the hope of obtaining natural skies is by no means so desperate; and I urge especially on those who wish to see photographs take rank as works of art not too readily to give way to any mechanical means of producing aërial effect. I hear that it is seriously proposed by certain photographers to take a series of negatives of clouds—stock negatives—to print into their landscapes as occasion may require or taste (?) suggest. Just imagine a negative secured of one of those cloud scenes in April, when the sun, bursting through, sends down his beams like rays from a gigantic fan: such a picture is a triumph, and we applaud the photographer for securing it. Suppose another negative taken of the sea, on a mild and tranquil day in June, when there is scarcely a ripple on the water, and the sky is "all serene:" such a picture will have a quiet beauty entirely its own, and quite different from the former one. But imagine the photographer, not satisfied with the calm and nearly white sky, bringing out his cloud negative, and by ingenious dodging printing in this turbulent sky, where from gaps in the clouds stream down those broad beams of light not one of which is reflected from the calm sea beneath. What shall we say if such a picture, so deficient in the first elements of harmony, be presented for our admiration and instruction? It may startle us by its novelty, and please us by its ingenuity; but how shall we designate it? Its novelty consists in connecting two conditions of atmosphere that never did or can co-exist, and its ingenuity in skilfully combining that which ought never to have been brought together. Shall we do violence to our feelings and call it an art-photograph? or shall we hint the unpleasant truth that it is only a piece of printing-frame patchwork? or shall we let it down easy, and call it a *composition photograph?*

It will be gathered that I am not sanguine of the advantage of printing skies into landscapes. Shall I rest contented with white skies, then? Yes, I say, rather than have skies not in harmony with the scene; but, as the late Sir Robert Peel used to say, "there is a third course open to us." During a recent visit to Manchester, I was much delighted with the beautiful productions of Mr. Mudd, and particularly with the manner he treated this question of "skies or no skies." I do not know whether I can do justice to his plan by description, but he kindly furnished me with a few examples to show you. You will observe that the sky, which is usually dead white, is in his delicately tinted, and that where the sky joins the land, instead of being hard and wiry, it is extremely soft and tender. These effects he gains by very simple and legitimate means.

He explained that his skies generally printed through, and to prevent this, he paints them out; but, in painting out, he only brings his black within a quarter or half an inch of the boundary of his landscape: he softens off this black, and thus leaves the sky to this extent to print through; this not only prevents a hard outline to his extreme distance, but it gives a charming effect of atmosphere. The rest of the sky prints quite white; but, after the print is taken out of the printing-frames, this dead white portion of the sky is exposed to light for a very short time, just to tint it, and by these two simple devices it is surprising what a charm he communicates to those portions of his pictures that would otherwise be white paper. Understand me distinctly, he does not paint in clouds; he only introduces delicate, wavy, irregular tints, just enough to disturb the monotony of the dead white plane and to suggest aërial effects.

If cloud backgrounds could be printed in, in this delicate, dreamy, hazy, imaginative style, I would not object to them; but unless they can be done in this quiet, unobtrusive manner, they had better not be attempted. Meanwhile, until we get our natural skies, I call photographers' attention to the delicate and artistic manner of Mr. Mudd; for by it they can join in the cry of—"down with white paper skies!" without running to the other extreme of keeping property negatives with which to print their clouds.

Before concluding this very incomplete essay, allow me to say a few more words on Art-photography. I feel that photography is capable of being made to minister to higher purposes than it has yet aspired to; and that it will as certainly take its place as a fine art as sculpture or painting—how early depends on the earnestness, truthfulness, and intelligence of its votaries. The tendency just now is to produce art-photographs by fragmentary portions rather than direct, and all at once. Strictly speaking, this consideration does not lie in our province. A photographer, like an artist, is at liberty to employ what means he thinks necessary to carry out his ideas. If a picture cannot be produced by one negative let him have two or ten; but let it be clearly understood that these are only means to the end, and that the picture, when finished, must stand or fall entirely by the effects produced, and not by the means employed to secure them. When judging of a painting, we do not ask the artist how many sittings he took from his models, or how often he arranged his lay figure. These are the mechanical appliances of the art—the mysteries of the printing and painting rooms. I lay stress on these points, because I find persons dwelling too much on the beauties of an art-photograph, and praising the artist *because* he composed it from so many negatives—thus exalting too highly the mechanical instead of the artistic skill. We have abundance of mechanical ability: it is the artistic we want to cultivate. For my own part, I am sorry to see that an artist-photographer is obliged to have recourse to more than one negative, and can fancy how he must be annoyed and crippled by working in this fragmentary way. Of two given pictures, equal in merit and design, that one is the best that is produced by the *fewest* negatives; for he is the higher artist who produces the greatest results with the smallest means. I consider it, then, rather a demerit that a given picture should require so many negatives to produce it. It indicates a poverty of means or design, and is so far a reflection on the art or the artist, or both; for, after all, the ultimate picture must appear as if produced from one negative. Not only are the manipulatory difficulties increased, but the risks run of altogether destroying that natural harmony and *chiaroscuro* always present in a picture taken from one negative are very great.

Finally, I do not think the advocacy of composition-printing tends to advance art-photography. It starts with putting clogs and fetters upon it. As mind is higher than matter, so is art loftier than mechanics. The artistic mind is not mechanically inclined. It is better—clearing all obstacles from his path—to

allow the art-photographer free scope to his fancy, and trammelled with few mechanical details; to give him freedom to use the camera and printing-frame, as the artist his brush and canvas, as the legitimate vehicles of expressing his conceptions of beauty.

In this way only, loving our art, can we hope to elevate it.

As Mechanical photography deals with Material Beauty, so let Art-photography deal with Intellectual Beauty; and when deep and earnest minds, seeking to express their ideas of Moral and Religious Beauty, employ High Art photography, then may we be proud of our glorious art, and of having aided in its elevation.

FACTS versus "GREAT EXPECTATIONS."

When a writer takes upon himself the office of censor, and criticises the speech or writing of another, we have a right to expect that he will, at least, confine his statements within the boundaries of truth. There is a code of honour in literary as in any other kind of warfare. He who transgresses that code ceases even to deserve the notice of his antagonist.

In less enlightened times it may have been necessary, from motives of personal safety, for an illustrious Junius to resort to the *nom de plume*. In those days a sense of honour would suggest to a writer the ignominy attendant upon "stabbing in the dark." "Σ," concealed beneath the mantle of "Great Expectations," has aimed the blow, but, being "in the dark, both missed his footing and his mark." I shall not attempt to inquire what motives have inspired him so completely to distort and misrepresent my statements and opinions. The bitter *animus* which pervades his criticism is but too apparent; beneath its influence his perceptive faculty has become so far deranged that he has failed to discover in my paper the very sentiments which he charges me with ignoring. He wilfully overlooks the fact that my paper was an address delivered as Vice-President of the Chorlton Photographic Society, before a number of gentlemen probably the equals of "Σ" in point of photographic intelligence—decidedly his superiors in the spirit of candour and the love of truth. Had I taken the course suggested by "Σ," I should have insulted their understanding by indulging in some recital of amusing anecdotes, by fulsome adulation as to some imaginary wonderful progress in their pursuits during the past year, or in some other way flattered their vanity at the expense of my own veracity. By this course, if they were the school-boys "Σ" would have us to suppose, they would swallow the opiate and investigation might sleep profoundly for another year.

In my address I discharged, to the best of my ability, the duty which was imposed upon me. Thus, in the first half of my paper, to use the words of "Σ," in his closing paragraph, I did point out that "photography has had an immense influence in the world. Young in years, it is a very infant Hercules in strength. * * It has opened a vast new field of chemical inquiry; it has stimulated a large amount of mechanical skill; and not the least of its benefits is the £ s. d. side of the question." All this, and much more of the encouraging phases of photography, was dwelt upon by me, as the reader may verify for himself. Has "Σ" thrown a single new ray of light upon our favourite science in the corrective paragraphs he has penned? "Physician," &c., &c.

In the second division of my address, referring to the field of chemical inquiry, I have stated that "a great number of facts require explanation;" and that my object in a partial enumeration of them has been to "excite a determination to commence a course of careful experiments, with a view to clearing up some of the mysteries that beset our art." It may be wiser and more sensible to stifle inquiry, and create "great discouragement" by a course of ridicule and anonymous misrepresentation; but "Σ" may be assured that he will gain no converts among readers of The British Journal of Photography, who are not to be led astray by disingenuous sophistry.

W. GRIFFITHS.

A FEW HINTS ON COMPOSITION AND KEEPING.

By Alfred H. Wall.

[Read, in continuation of the discussion on Mr. Fry's paper, at the Meeting of the South London Photographic Society, on the evening of December 20, 1860.]

The question of composition-printing is not only a mechanical but *an artistic one*. The mere process of printing from several negatives to form one picture will depend for its success upon the skill and ingenuity of the operator, who may produce a paste-and-scissors affair—"a thing of shreds and patches," offensive both to common sense and good taste, or one in which the joinings are so artfully concealed as to be invisible to any but a more than ordinarily experienced and careful observer. But in either case it is merely and purely a mechanical process, and by no means to be claimed, in this sense, as anything at all artistic in itself. Artistic composition is quite another thing, and it is to the word in *this* sense that I intend my present few remarks to apply; for even when this highest mechanical success has been attained, and no cruel lines cut up the affair into mere patchwork, there are yet other considerations of far higher importance to the real pictorial value and high character of such productions.

The most legitimate method of using more than one negative for a single picture is undoubtedly that to which Mr. Fry applies them, when printing in skies to marine views or landscapes; but the operation is one which must not be undertaken without a thoughtful study of nature, and extremely careful manipulation in the printing process. In the first place then, I would suggest to Mr. Fry that in procuring transcripts of so difficult a subject as water in motion an exposure more strictly instantaneous than that he adopts would be an advantage. I think if he compares a more absolutely instantaneous picture of waves to some of his own productions he will find that, while his own have lost somewhat of that characteristic beauty of form and detail in which the more striking truthfulness and effect of such a subject lies, the former will have a clear crispness of outline and detail which is pre-eminently eloquent, in their fantastic and continually varying forms both of the material and of its various pecularities. Although no advocate for extreme sharpness in general landscape, I have frequently observed that the least woolliness in the outlines of moving water goes a very long way towards destroying its truthfulness of effect. More particularly will this be perceptible in what artists call accidental waves, viz., waves which are influenced by such accidental causes as the inequalities of the shore, and by rocks or other impediments which not only cause them to rise or leap to a greater height before bursting, but also originate a great number of broken waves, which are decidedly of keen-edged, jagged forms, and should be represented with clear definition and distinctness in the photograph.

The Heavy Sea at Brighton, which Mr. Fry exhibited in illustration of his paper, is, I think, open to the objections I have brought forward, due, as I venture to state, to an exposure which, considering the actinic influence of water in light, and its rapidity of change in assuming diverse forms, was too long; but it should be remembered that no greater accumulation of difficulties can exist to baffle the most expert and artistic photographer than those Mr. Fry has so boldly undertaken to combat. I find, in a work by an authority among our landscape painters, the following remark. Speaking of the treatment of water, he says:—"Softness and obscurity in outline is to be avoided here, more even than in clouds, as without clear and firm edges no transparency can be obtained; and, although in looking at the foam and spray of waterfalls or cataracts it is not easy to see how such broken forms can be produced by laying on tints with defined edges, a careful examination will prove that there is no other means by which a good conclusion can be attained."* The foam in the picture I have called your attention to has no real shapes or forms, which, however great the apparent confusion arising from the mistiness of the drifting spray, certainly existed, although changing so rapidly and in such minute fractions of time, as to defy any exposure but one more strictly instantaneous to seize the real appearance.

Turning now to Mr. Fry's cloud negatives, I would impress upon him the necessity of securing, for every composition picture he may undertake, the identical sky which may be associated with it in nature. Every scene will be affected to no small extent by the character of the sky under which it appears; and this being the case, as it is acknowledged to be by all authorities, you will understand what subtle and delicate modifications of aërial effect, and what tender gradations of *chiaroscuro* must arise from the various atmospheric conditions as indicated by sky and cloud. To print in *any* sky to *any* landscape will therefore be erroneous in principle, although it is very possible that an artistic and scientific observer of nature may do so with impunity, defying detection. I remember seeing a composition print not long since which put a landscape taken on a clear, bright, sunshiny day, in a pure and colourless atmosphere, under a sky full of low-lying vapours and masses of misty cloud. It had been shown and admired among certain photographic circles without the detection of its funny mistake, which is only one of the many proofs I could name of the great absence of, and urgent need for, artistic culture in the practice of our art.

* Barnard on Landscape Painting.

If this be the case in obtaining a sky and cloud negative under ordinary circumstances inland, how much greater becomes the necessity of securing the sky and landscape at the same time when photographing marine views! Every variation in the glorious dome above is reflected in, or has its influence upon, the eagerly sympathising surface of the water beneath. The seemingly wayward humours of reflection and hue, which are continually changing on its mirror-like surface, have their origin for the most part in the no less wayward variations above; and the placing of a sea under a sky foreign to it in character is so destructive of harmony and truth that, even where undetected by the eye, it will be repulsive to that instinctive recognition of truth which so often makes an ignorant observer just in his judgment although erroneous in the words or ideas in which it is intended to be expressed. Nor let it be thought that such reflections upon the surface of water can be so readily accounted for that they are easily imitated. Apart from certain atmospheric characteristics peculiar in their harmonious effect to both sky and water, but more nearly related to perspective, the mere question of simple surface reflections involve a number of very complicated scientific considerations. How often do we see certain portions of clouds and sky, or certain objects on the shore, reflected in a most unaccountable way on the surface of some lustrous lake's clear surface, while other things which you would certainly expect to see in such a mirror are as singularly absent! How often are we, despite the recognised optical laws which govern reflections generally, compelled to recognise the existence of disturbing circumstances which baffle foregone conclusions and defy ordinary calculations! I, and doubtless most of you, have been perplexed by such singular operations of nature more than once. The height and position of the clouds, the height of the camera (or eye of the spectator), the density of the atmosphere, and a thousand other chances, seem to influence such effects in their wondrous diversity of changes. The licence, therefore, of using one sky for combination with several sea or land views is, to say the least, a very dangerous one, and one which I do not think a society with any artistic pretentions should encourage. To conclude, I should recommend that where the practice of composition-printing to secure natural skies is adopted, you should, for the sake of good taste and artistic truth, take your sky at the time you secure your landscape.

REPORT OF THE EXPERIMENTAL COMMITTEE OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY ON THE DRY PROCESSES.

THE first subject chosen for investigation was the Dry Processes generally. The question being naturally a very wide one, the Committee could not possibly, in the short time they have had at their disposal, arrive at any decisive conclusions on it. Indeed, considering the large number of formulæ for dry photography, they scarcely anticipate being able to do more than practically to compare the different processes one with the other, and carefully to note and point out the good and bad qualities of each. If in addition to this they succeed in advancing another step, however slight, towares the elucidation of this important subject, they feel assured that their time will not have been misapplied.

In this report, which must only be considered as a preliminary one, the Committee have given their opinions and experiences individually, and not collectively—a plan they propose adopting on all future occasions.

The first question which the Committee considered was, *the possibility of preparing dry plates to equal wet collodion in sensitiveness;* and, as a short step to its solution, appointed a sub-committee to test Dr. Norris's plates, which were stated to be the most sensitive hitherto produced. After most careful trials, the individual opinions arrived at tallied, as nearly as possible, with that of Mr. Davis, here given :—

"My inference," he says, "is, that the plates at present prepared by the Dry Plate Company are about one-third less sensitive than by the most rapid wet collodion, and equal to that of average sensibility." Having thus established the certainty that sensitive dry plates can be prepared, the Committee are now engaged in investigating the principles involved in producing qualities favourable to that end.

The Committee have next to place before the Society the result of some general experiments which have been made by individual members, commencing with the following valuable remarks by Mr. Davis :—

General Remarks on Dry Plate Photography.

BY SEBASTIAN DAVIS.

IN conducting some experiments in connexion with the Experimental Committee of this Society, I have at present directed my attention to the principles involved in the preparation of dry plates. Dry plate photography, as at present practised, divides itself into two methods of proceeding. We have upon the one hand those processes which are based upon the principle of introducing organic compounds, soluble in water, into the pores of the film; and, on the other, the combination of albumen with collodion, and its subsequent conversion into an insoluble state. The practical advantage which attends the adoption of the former method arises from the facility with which an aqueous developing solution permeates the structure of the film, thereby favouring rapidity of development. This easy solubility of the preservative media in water necessarily precludes the possibility of a retentive power being exerted between the glass and collodion film by its agency. Pure albumen, on the contrary, is not only susceptible of actinic impression when in combination with many salts of silver, but it possesses an adhesive capacity in in an eminent degree. Albumen, unfortunately, is not entirely efficient as a preservative agent, inasmuch as all its sensitive combinations with salts of silver are liable to spontaneous decomposition, even in complete darkness. We thus have two classes of media, the nitrogenous and the non-nitrogenous—each possessing special qualifications as preservative agents, but neither unaccompanied by characteristic deficiencies.

The special experiments to which I would call attention are those made with preservative agents soluble in water, and which, when applied to the collodion film, renders it pervious to aqueous solution after a preliminary dessication. The bodies that possess this property, and which are most worthy of notice, are gum arabic, British gum, gelatine, metagelatine, extract from the dried grape, glucose, dextrine, infusion of malt, sweet wines, molasses, oxymel, melted sugar, and the mucilages prepared from linseed, quince seed, carrageen, &c. In experimenting with these bodies, I have considered it indispensable to practical success that they should be capable of preserving the collodion film in a sensitive condition without the presence of free nitrate of silver. I have, therefore, converted the free nitrate salt into a chloride of silver by washing the excited film in an abundance of common filtered water. By then covering the plate with different solutions of the above-mentioned bodies, of suitable strength, photographical results of more or less practical importance will become apparent. Gelatine and metagelatine will be found to possess the inconvenience of requiring a more thorough soaking in cold or hot water, between exposure and development, than is compatible with the tenacity of the most suitable collodion film. Gum arabic, under all circumstances, is liable to enter into spontaneous decomposition when brought in contact with the sensitive surface, and many foggy pictures are the inevitable result of its employment. An infusion of malt and linseed offer practical advantages over gum, arising from the facility with which they can be washed from the collodion surface: they do not, however, preserve the plate for many days, so as to ensure clean and perfect pictures. A similar drawback accompanies the use of molasses, oxymel, solution of melted sugar, and a solution of quince seeds, or carrageen. If we except some partial and peculiar stains, British, or sweet wines (as ginger and raisin), act excellently as preservative agents, provided the superflous quantity be gently washed from the surface of the plate before drying. The extract obtained from the dried grape, as imported to our country, appears to afford a solution equal or superior to any of the above; whether its use will prove to be accompanied with any practical obstacle to uniform success must be left to the decision of further experiments. Upon a future occasion I hope, with the assistance of my colleagues, to form a specific opinion with respect to the best dry plate process for landscape photography, and to furnish a report upon the practical and theoretical merits of the recent suggestions in connexion with the preparation of collodio-albumen plates.

Mr. Davis has also made some highly-interesting experiments on the Petschler and Mann process, the particulars of which he has promised to impart at a future opportunity.

Mr. Bochert, of the German Hospital, Dalston, has been indefatigable in his experiments on this subject, and his communication is the more valuable because he illustrates every step of it with an experimental plate.

Although the following extracts from his notes are not, perhaps, so conclusive as might be desired, yet the Committee hope that in placing them before the Society the members may be induced to experimentalise in some of the directions pointed out, so that useful conclusions may ultimately be arrived at.

Mr. Bochert's Experiments on Sundry Dry Processes.

DR. SCHNAUSS, lately making some experiments on iodide of silver, comes to the conclusion that *iodide of potassium employed before exposure on a sensitised film nearly destroys all sensitiveness to light,* and leaves it to practical photographers to draw their own conclusions.

There appears to me one important case for doing so in the collodio-albumen process, where, over a sensitised film, iodised albumen is poured. According to Dr. Schnauss, sensitiveness ought to vanish away hopelessly, as the second sensitising is pronounced to be unable to restore the previous sensitive condition of the iodide of silver in the film. Nevertheless, the efficacy of the collodio-albumen process is beyond doubt.

I repeated his experiments with the following results :—

Plate 1 had a weak solution of iodide of potassium poured over its lower half, and was then well washed, redipped for one minute, and exposed. The result was, as described by Dr. Schnauss, a nearly complete loss of sensitiveness. The part treated with iodide of potassium had a dense dead yellow colour, and was not transparent at all, like a film produced by an over-iodised collodion. It struck me that, through over-iodising, the film may only become inaccessible to the sensitised bath because the meshes are blocked up.

I repeated the same experiment (plate 2), and allowed the plate in re-sensitising to remain in the bath for five minutes instead of one, and I obtained a picture as dense as can be desired. This proves, I think, that Dr. Schnauss's experiment allows no conclusion on the chemical properties of iodide of silver, but on the state of mechanical deposition of the iodide of silver in the meshes of the film.

His third experiment of treating an exposed plate with iodide of potassium, exposing to daylight, then washing and re-sensitising (but now five minutes instead of one), I have repeated, and got a dense picture, the little fogginess of which I am inclined to attribute to faults of my own.

Mr. Bochert then directed his experiments to Petschler and Mann's modification of the collodio-albumen process, and after many trials gave it as his opinion that the plates, previously to the final washing, could not with safety be exposed to diffused daylight.

He then goes on to say:—

Now Mr. Petschler suggested that iodide of potassium gave similar results to his process. Finding the chloride not answer, I tried the iodide. Plain albumen, containing two grains iodide of potassium per ounce, was poured over the washed sensitised plate. After drying, I tried the sensitiveness to diffused light, by exposing one-third to the sun for twenty minutes, another third to dull diffused light for three minutes, and kept the last third entirely protected. After twenty-four hours' keeping, the plate was soaked in water for half-an-hour, then fully washed under a tap for several minutes. After drying, exposed in a stereoscopic view camera to an object strongly illumined by the sun for six minutes, in developing no trace of picture could be obtained; but exposure to strong sunlight of one-third of the plate produced a slight fogginess, which might not perhaps be much noticed on a strong picture behind.

Now, I remembered Dr. Norris's suggestion, that in the case of iodide of potassium on the film, hot water removed more completely this salt. I prepared a plate similar to the last, soaked it in cold water for half-an-hour, and washed it by pouring over it about a pint of hot water. After drying, I exposed the same time as before, and obtained a dense strong picture.

From this last experiment he draws the conclusion that when plates are required which, in their comparatively insensitive state will bear moderate exposure to daylight, it will be better to prepare them by the Taupenôt process, and make use of Dr. Norris's suggestion to finally sensitise by washing with boiling water.

He obtained highly promising results by Dr. Ryley's process, as given by Mr. Parry at the meeting of the Manchester Photographic Society in October last. After sensitising and well washing the plate, he coated it with uniodised albumen, and then, draining for a few minutes, immersed it in boiling water. Exposing in the camera, the resulting negative developed out remarkably clean, and any amount of intensity could readily be obtained. He has promised to continue his experiments in this direction.

In speaking of the Fothergill process Mr. Bochert makes the following interesting communication:—

Fothergill's process, as advocated by Mr. Ackland, gave in my hands good results, although the least deviation from the prescribed manipulations is followed by a series of different descriptions of stains. As an essential point, I mention here the use of four to six drachms of distilled water for the first washing, and the prepared albumen containing five minims strong ammonia in three ounces liquid (one part albumen to two of water), or half a drop strong ammonia per ounce.

I was advised to try a modification of the Fothergill process, propounded by Mr. Hannaford at a meeting of the South London Photographic Society, which was to ensure entire freedom from stains. Mr. Hannaford does not dilute with four drachms of water, but washes the plate under a tap, redips it into a weaker silver bath (four grains per ounce), and pours on a solution weak in albumen (one part to six of water), but strong in ammonia (about four drops per ounce), and containing between ten and twelve grains of citrate of ammonia per ounce.

I tried Mr. Hannaford's process, and found it answer perfectly, the plates being certainly free from stains, but requiring 25 per cent. longer exposure. In dry plates I think a little longer exposure does not much matter.

To what circumstance must I look for the difference of results?

The albumen may produce in both cases albuminate of silver; certainly a larger amount in Ackland's. The albuminate being soluble in ammonia may be liquified and washed off (being in small quantities) in Hannaford's; very likely not in Ackland's, or not entirely, and perhaps assisting in the formation of stains.

The citrate of ammonia, easily soluble in water, could not, after washing under a tap be supposed to assist anyhow: it may in the first instance convert the minimum of nitrate of silver combined with the pyroxyline, either chemically or mechanically, into citrate of silver; but this citrate (an infinitely small amount), being easily soluble in ammoniated water, will wash off under the tap.

Starting from the inestimable experiments of Hardwich and others, on the value of all the substances used as preservatives in the dry process, which prove distinctly that their influence is *essentially mechanical*, keeping the pores of the film in a distended state during drying, and giving easier access to the developer—that their chemical influence is only experienced when they are combined with oxide or nitrate of silver, and even then to the detriment of the keeping of the plates:—I was of opinion that the larger amount of ammonia Hannaford's process, having little or no action on iodide and bromide of silver, exerted what I may be allowed to call a last and complete *cleansing effect on the film*, taking away all silver compounds out of the meshes of the pyroxyline, and relieving the iodide from any embarrassment through preservatives which take now-a-days all the glory to themselves, putting the hard-working man (iodide of silver) into the dark.

I now prepared a number of plates, taking care to work with the same collodion, bath, &c., exposing at the same hour of the day, on the same object, and in close comparison to one plate prepared according to Hannaford's formula. It is clear that, following my supposition, the second sensitising was at once a waste of time and labour.

As modifying or cleansing liquids I employed (*a*) *ammonia and water*, four drops per ounce; (*b*) ammonia and water, two drops per ounce; (*c*) ammonia and water, one drop per ounce, with two grains of citrate of ammonia; (*d*) acacia and water, with two drops of ammonia per ounce; (*e*) Hannaford's normal prepared albumen, containing four drops of ammonia per ounce (his prescribed evaporation of ammonia at the common temperature in a dustless room being in most localities practically impossible, and if possible resulting only in the loss of half the ammonia).

As the plates, *b*, *c*, *d*, *e*, show the same sensitiveness, intensity, and freedom from stains generally, it proves to my mind that all interference of preservatives or silver compounds, besides iodide and bromide, is done away with, and we behold the pure sensitiveness of iodide and bromide to light. But a plate having been treated with the strongest ammoniated water, without mitigation by any additional preservative, although the same compact collodion was used, exhibited after drying the peculiar lustreless dull appearance of a film made with entirely rotten collodion, and in developing brought out the picture unusually quick, but weak, and of a gray leaden hue, resisting all further attempts to intensify. The rottening effect of ammonia on a horny collodion in the bottle is sufficiently well known, and we find the same effect going on here.

In my opinion, this effect must be mitigated by gum, albumen, &c., or more reasonably by simply decreasing the strength to one drop ammonia per ounce, and by not allowing the liquid to stand on the plate beyond half a minute.

Perhaps a short immersion in a tall bowl filled with ammoniated water will best answer the purpose, as then the back and the roughened edges of the plate are cleansed equally at the same time.

The Committee have dwelt at some length on Mr. Bochert's experiments, and although, individually, they differ in opinion from him on many of the points advanced, yet they consider his communication contains much that is sufficiently novel and interesting to merit the notice of the Society.

Mr. Ackland has made an important statement, to the following effect:—

In many of the dry processes the excess of nitrate of silver remaining on the plate after washing is precipitated as a chloride, citrate, acetate, or other insoluble salt:

A plate so prepared can have its degree of sensitiveness doubled by immersion in a weak solution of nitrate of silver, and afterwards washed:

It therefore follows that, if sensitiveness be the object aimed at, nitrate of silver should be in excess on the plate.

Mr. Hannaford has been more exclusively engaged in experiments connected with the production of instantaneous dry plates, on which branch the Committee propose entering more fully in their next report on the Dry Processes.

Messrs. Tear, Clark, Leake, Blanchard—practical members of the Committee—have been deterred by the weather from prosecuting their experiments as energetically as might be desired.

The Committee have now only to state that early in the coming year, before the season for out-door work begins, they hope to place before the Society a much more conclusive report on the subject.

A PROTEST AGAINST RETROGRADE MOVEMENTS IN TONING POSITIVES.

By "P. P."

Perhaps I may be allowed a few remarks in reference to Mr. Ewing's reply to my letter on the subject of his paper in your number of December 1st. In the concluding paragraph of his paper (see Journal of 15th November) Mr. Ewing states that he may not be correct in the views he has taken on the subject under consideration, but that he is very willing to be corrected, concluding with these words:—"When any notion of any particular theory seems false to us, we should endeavour to eradicate that notion from the minds of others; or, if we are wrong, to have it properly understood by ourselves, thus fulfilling the end of mutual improvement." Mr. Ewing's perfect sincerity when he penned these statements may be reasonably questioned, from the concluding remark of his reply, in which I am charged with misconception and arrogance for acting on the principle thus laid down by himself, when trusting in his good faith I endeavoured to point out, certainly in no unfriendly spirit, an error into which I conceived he had fallen, and ventured to express my own views on the subject, That I may have misunderstood the drift of Mr. Ewing's paper, and put a wrong construction on some of its paragraphs, is quite possible—and if I did so I can only express my regret; but when he charges me with arrogance, in not receiving all he said as infallible truth, in which I was only carrying out his own professed principle as stated, we begin to doubt the sincerity of his willingness to be corrected, and are entitled to suspect the truth of his cause.

As to his charge of misconception, I have to reply that I have carefully read his paper over again with all the light of his explanation; and while I admit that he does not directly recommend the old hypo. bath, I still cannot help coming to the conclu-

sion—from the terms in which he speaks of it in conjunction with the alkaline bath—that his predilections are in favour of the former. It is true that in the paragraph he wishes especially to call my attention to, and which I did *not* overlook, as he supposes, he reluctantly admits the superiority of the alkaline. I say *reluctantly*, for he afterwards destroys the force of this admission by urging against it a train of objections which, if they had any force, would completely destroy its utility.

But admitting his own affirmation that he gives no preference to any of the named baths, what I wish more especially to notice is his positive declaration (repeated in his letter) that we have yet no printing process on which we can rely to produce permanent proofs. I maintain that Mr. Ewing has no ground whatever for such an assertion. Unless he can prove that all those photographs toned by the new method, which have stood perfectly unchanged for three years, exhibiting no trace of yellowness in the whites, nor loss of vigour in the blacks, will shortly manifest these symptoms of approaching decay, he cannot substantiate his assertion. And I should like to know by what species of argument he will endeavour to prove this. Will he reason from analogy, and tell me that prints toned by the old method have stood well for three years and afterwards faded, thus leading to the inference that alkaline prints will do the same? I reply that such an argument will not hold good, since, while it can be said of *some* prints by the old method that they have remained unchanged for three years, it is true only of a very few, too few in fact to form a practical exception—ninety-five out of every hundred discolouring before that time. How many of the thousands of prints toned by this method three years ago are as good now as they were then? Not a greater proportion, I firmly believe, than that I have named. But does the same apply to alkaline-toned prints? Mr. Ewing himself answers us; and others with perhaps greater experience, and in a better position to judge, will tell him that the very reverse is the fact, and that instead of finding only five unchanged in every hundred, or a similar proportion, it would be difficult to find that number which in any perceptible degree had changed. Unfortunately we cannot go back to a longer period whereby to test the merits of the new system; but shall we condemn a most promising discovery when sufficient time has not elapsed to test its merits, and which so far has given great satisfaction in every respect, and exhibited no symptoms to shake our confidence or excite our suspicions? This is precisely what Mr. Ewing has done in his sweeping denunciation. Further comment on this point is unnecessary.

I read the paper of Mr. Heisch to which Mr. Ewing alludes; but, so far from doing my "heart good," as he so kindly anticipates, it only awakened a feeling of regret that a gentleman of Mr. Heisch's scientific attainments, and with the influence which consequently attaches to his name, should endeavour to throw suspicion on the value of a discovery which many of his fellow scientific workers, after demonstrating its truth, have laboured to establish, and which was gradually taking a firm hold on the public mind, and displacing a system which the experience of fifteen years has proved unstable, and which was tolerated only because no other was known. What is it, I would ask, that has associated with photographs the idea of instability, against which so great an outcry has justly been raised? Nothing but the use of that vile system which Mr. Heisch seeks still to uphold. Have we not been sufficiently disgusted by the prevalence of "yellow fever" amongst our pictures, that we should still desire to prolong the system which we know too well is the certain and only cause of it? I can only hope, for the interests of photography, that the simple and, I will add, correct method of toning by alkaline chloride of gold has extended too far, and taken too deep a hold on the convictions of photographers, to be upset or even checked by the unsound reasoning of Mr. Heisch, or the denunciations of Mr. Ewing.

In the approving note of the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY to my former letter it is said that freedom of discussion eliminates truth, and this must be my apology for again trespassing so far on the valuable space of the Journal.

STEREOGRAPHS.

Stonehenge, Cathedral Interiors, &c., by GEO. WILSON, *Aberdeen.*

THE association of ideas implied in the preceding "heading" is not so incongruous as might at first be supposed, for we believe that it is a matter beyond dispute that Stonehenge was formerly used as a temple, in which Divine worship (or what was supposed to be such) was performed. As another connecting link between the two classes of subjects, we cannot forget that Stonehenge and Salisbury Cathedral are almost inevitably associated together by sightseers visiting the county of Wilts, and from one cathedral to another is a natural transition. In our last notice of Mr. Wilson's beautiful productions we treated especially of his "instantaneous" pictures, and should therein have included one of his Stonehenge subjects but that we considered it would range more correctly with the others of the same series.—That to which we particularly allude is entitled STONEHENGE: GENERAL VIEW FROM THE EAST (No. 207). The spectator is supposed to be standing on a portion of Salisbury Plain, where there is a slight depression below the general level of the ground, so that the effect is similar to that of a building placed on an eminence. An entire circle of the huge stones is included in the view, and the fine rolling masses of sunlighted clouds form a splendid background to so grand a subject; the proportions of which are cleverly indicated by the figure of a gentleman, in the central part of the view, leaning against one of the upright stones, and a carriage drawn up close to the circle on the right side of the spectator. A flock of some twenty-five to thirty sheep are scattered in the foreground, feeding upon the herbage of the plain, which is rendered without the defect of undue darkness so commonly prevalent where grass forms a portion of the subject of a photograph; and numerous buttercups in flower are plainly discernible.—Nos. 209A and 209 are respectively a NEAR and a NEARER VIEW of some of the more remarkable of these singular stones as seen FROM THE WEST. In the latter the spectator peers, as it were, into the very texture of the stone, and perceives it to be covered on the surface with numerous nooks and crannies, wherein mosses and lichens in great abundance have found a fitting habitation, while at the bases of the massive blocks crowds of nettles and other plebeians of the vegetable kingdom find a welcome shelter.—No. 211, NEAR VIEW FROM THE SOUTH-EAST, presents similar characteristics to the preceding; but here the almost boundless extent of the plain is seen stretching far away in the distance, bounded only by a faint horizon.

From all the drawings that we have seen (numerous as they have been) of this singular monument of antiquity but a very imperfect idea could be formed of the real appearance presented by it: but this is not the case, we need scarcely remark, with the stereographs before us. Far from lacking interest, they are overflowing with that valuable qualification.

From Salisbury Plain to Salisbury Cathedral we pass as a matter of course; and of this edifice we have six illustrations, all of first-rate character. The long-drawn aisles, the nave, the choir—all are beautiful and suggestive; but of these we give the preference to the SOUTH AISLE (No. 214), in which the long perspective of column after column and pointed arched roof is indeed very fine, culminating, as it were, in a fine monument and stained-glass window.

THE CLOISTERS (No. 217) form a subject of a similar character to that last noticed; but here the architectural beauties are not so elaborate, nor the distance included nearly so great. The roof is lower and the span more obtuse; but there is an exquisite artistic effect introduced in the soft reflected light from the pavement upon what would but for its presence have been deep shadow at the apex of the arched ceiling.

In No. 215, THE TRANSEPT, the play of chequered light on the columns on the left contrasts admirably with the cool repose of the chapel-like monument in the foreground.

Perhaps the most beautiful of the series, however, is No. 216 THE ENTRANCE TO THE CHAPTER HOUSE, in which so many excellencies are combined that we find it extremely difficult to give any adequate idea of it. The effects of colour are so admirably rendered that, when viewing this slide, it is almost impossible to disabuse the mind of the notion that it is not indebted to the painter's art. From the interior of the building the spectator looks through a twin-arched doorway into a vestibule closed by an ornamental glass screen, of which the rectangular door stands open. Through this glass screen a portion of an external collonade is perceptible on the nearest side of the quadrangle, and a further portion of it on the opposite side; while just in the centre stands a splendid cedar tree, the stem of which comes opposite to the open door. The floor of the edifice consists of a pavement of vitrified ornamental tiles, which obscurely reflect the surrounding objects. The beauty of the structure is evidently enhanced to no inconsiderable extent by the judicious combination of various colours, which serve to heighten the effect of the carving and moulding; and it appears perfectly marvellous how the idea of this can have been so distinctly conveyed in the simple monotone of the photograph. Such, however, is the fact, and we cannot too strongly advise all lovers of the curious as well as of the beautiful to make a point of adding a copy of this slide to their collection.

Of our Metropolitan Cathedrals we have an interior of St. Paul's (No. 203); but in this the solarisation arising from the glare of light from the widows facing the spectator has been fatal to the perfection of the illustration; and the same remark will apply to No. 193, The Choir of Westminster Abbey. To some extent, also, a similar blemish may be noticed in No. 198, The Cloister of Westminster Abbey. It must not, however, be supposed that these are not good specimens. They are simply not equal to the very high standard usually attained by the operator who produced them.

There are four other illustrations of Westminster Abbey that are entirely free from the drawback noticed in the preceding, although in three of them a window is situated similarly with regard to the spectator. It is therefore probable that the artist was compelled to operate when the sun was in the most unfavourable position, photographers being often obliged to work when they can instead of when they will.—In No. 192, The Nave, two of the sculptured monuments on either side of the choir entrance form prominent features of interest. It is, however, to be regretted that the enormous pile of chairs and benches used during Divine service on Sunday evening could not have been removed before taking the picture; but of course this was out of the question.—No. 194, The South Aisle, and No. 195, Poets' Corner, will no doubt find many admirers; but No. 199, The Interior of Henry the Seventh's Chapel, will in all probability be the favourite.

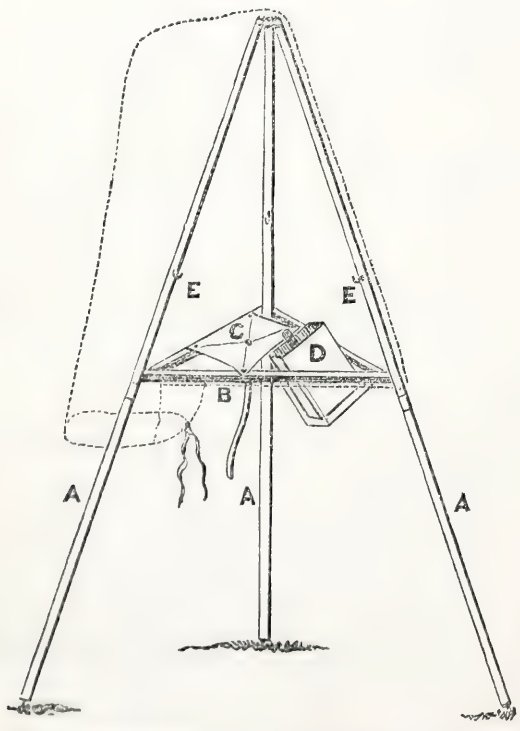
We cannot conclude without congratulating all interested in ecclesiastical architecture upon the facility they now enjoy of an opportunity of securing such truthful illustrations, at a trifling outlay, of structures which are regarded by the profession as invaluable for study to aid in the formation of a pure and elegant taste in architecture.

PORTABLE OPERATING TENT.

By John Louch.

The rods A are § of an inch in diameter, and when jointed together seven feet long. The cross pieces, B, about two feet long, § of an

FIG. 1.



inch square, each jointed to one of the rods A, with a hinge at one end, and provided with a hook at the other, to fall into an eye on the opposite rod, as shown in the subjoined sketch, *fig.* 2, also

FIG. 2.



provided with screws to attach the sink of india-rubber cloth and the gutta-percha or other bath.

The covering, represented by the dotted lines, which, in the case of my tent is of three thicknesses of common yellow-glazed calico, but which I should recommend, for the sake of lightness and portability, to be made of india-rubber cloth,* should be made to fit tightly, and be nailed to the upper part of the frame, leaving the sockets of the rods projecting. A bag or pocket must be made in the underside of the covering to admit the bath, and if provided with strings at the lower end, by tying them to the rod, any amount of inclination may be given to the bath. The covering must be enlarged at the side next the bath, as shown, and open at the bottom to admit the operator, with strings to draw round the waist. Hooks, or if preferred, pockets, in the covering to hold the necessary bottles.

The tent may be erected in a few minutes by the photographer, without any assistance, in the following manner:—Holding the upper part in an inverted position, fix the lower ends of the rods into their sockets; then placing the tent in its proper position, separate the rods to such an angle that it will stand; then by inserting the head and upper part of the body into the tent, the cross-pieces may be brought to their proper position, and the sink, if made to fit tightly, will stiffen the whole. The bath and bottles may now be put in their places, and the tent is ready for use.

The framework of my tent is of deal, and weighs, with the covering, the sink, and outside cover, under five pounds; but, with neater workmanship and a lighter covering, the weight might be considerably decreased.

I am contemplating making one with thin brass tubes, sliding one within the other for the frame, by which means no part of the tent would be removeable, and there would be no fear of leaving any part behind when on a tour.

The tent is very stable, as a proof of which I may state that I had it in use on the day that the "Great Eastern" was blown away from her moorings. I, of course, contrived on that day to get it to the leeward of some building.

The only inconvenience that I have found in its use, is that in hot weather it is rather confined, and the vapour of the ether is unpleasant; but that may easily be remedied by adopting some means of ventilation.

NOTES OF A PHOTOGRAPHIC YACHT VOYAGE IN THE MEDITERRANEAN.

By W. J. C. Moens.

(*Continued from page* 370.)

We arrived at Cagliari on the 13th December, and spent the rest of the year snugly in port, thereby escaping some very bad weather at sea. The consul there, Mr. Craig, is a great lover of the art, but hitherto he has only taken waxed paper negatives. He was very desirous of working with collodion, but the difficulty of obtaining the materials had deterred him; for there are no depôts of any consequence in the Mediterranean, nearly everything having to be procured from Paris.

The dress of the natives here is very quaint. The covering to their heads consists of a kind of black nightcap, the square end of which hangs over the forehead: long black flowing hair, which is never cut, a red cotton handkerchief tied over the cap and under the chin, a black jacket with buttons, a very short kind of kilt, and very loose white cotton trousers—these, with black cloth gaiters, complete their dress. We often wished we could photograph the different costumes we fell in with, but the trouble of getting them to sit deterred us.

On the 19th I took a panoramic view of Cagliari on four plates; exposure about one and a quarter minutes. The Consul came with me, and was astonished at the quickness of wet collodion even on a cloudy day.

The next day we started on ponies for a journey into the interior, in order to pay a visit to the grotto of St. Giovanni, which runs for a distance of more than half a mile under a high mountain, coming out into a deep gorge on the other side. In wet weather the grotto forms the outlet for a mountain torrent, which thus runs under the mountain. It is full of the most beautiful stalactites and basins formed of petrified water: the light from our flambeaux and torches being reflected and re-reflected from these presented a most glorious spectacle. When we got near the end of the cavern, a most curious effect was produced by the sunlight shining on the rocks and trees outside, being separated into the prismatic colours, which caused everything to appear as if encrusted with every kind of precious stone. After spending several days shooting, we returned in order to spend Christmas Day on board, which we did in true English fashion, our dinner consisting of a turkey, roast beef, and plum-pudding.

On the 27th I tried to photograph, but the wind was too high; so we amused ourselves by printing pictures, for we always got positive proofs as soon as we could, in order to keep up our albums. The sight of this

* With, of course, sufficient transparent yellow material to admit the necessary amount of light.

caused great astonishment; for the people said that they often heard of travellers photographing, but never saw any results.

On the 29th I went to take an old Roman tomb — supposed to be that of a doctor, from the serpents which are cut on the façade. I found it rather difficult from the deep shades cast by a very bright sun. I commenced with thirty seconds, and finished with 1¼ min. I tried to get a very pretty girl, Marie by name, to include herself in the picture, but I could not induce her to stand quiet. I next took a picture of the graves cut in the rocks, attributed to the Venetians, who founded the city Calaris, on the site of the present Cagliari. These chambers are coated inside with plaster, with a hollow recess cut for the body, and little niches for their lamps, and gods just over. One we saw was for the reception of a family, several of the recesses being for children. They were entered by a descent of a few steps and a door. There was, also, an entrance at the top; but this was covered in with flat stones, and evidently was intended for the dead body to be lowered through. Several of these chambers are now inhabited by poor people. After this I went to the Roman amphitheatre (exposure forty seconds, and for stereoscopes eight seconds). It is very hard work trotting about from place to place, even when you are lucky enough to have men with you to carry about all your things.

On the 31st we completed our photographic labours at Cagliari by taking a panorama from the east side, on four plates. The light was very bright and difficult, the mountains in the distance developing very dense. We printed some pictures to present to our photographic friend, Mr. Craig, who had paid us great attention, and lent to us the numbers of the Journals we had not seen, in one of which was announced the heart-breaking loss the president of the Dublin Society, Capt. Henry, had sustained by the sinking of his yacht, the Mariquita, in Holyhead harbour, with all the negatives he had taken during a trip of the same character we were now enjoying. It is difficult enough to get pictures at home; but abroad it is ten times worse, where all sorts of obstacles and hindrances are continually arising which prevent you taking the pictures you wish, and which, too, you may never have another opportunity of procuring.

On the 1st January, 1860, we unmoored at daybreak, and got under weigh for St. Antioco; but a fresh wind springing up from the westward, we altered our course, and steered for Tunis, in order to visit the ruins of Carthage. We reached Cape Carthage by dusk the next evening, and, the wind failing us, we brought up for the night, the navigation being bad for want of lights. We weighed anchor next morning early, and sailed close past a number of ruins, some large masses of brickwork being very apparent. We brought up off the Goletta, which is the Port of Tunis; the town being nine miles off on the other side of a shallow salt lagoon. We paid a visit to the Consular Agent here, and then went up to Tunis in his boat. Here is seen an Eastern city in all its filth and glory:—Moors in gorgeous flowery dresses; camels in numbers going through the narrow streets; natives talking and quarrelling with each other in Arabic; negroes strutting about, considering themselves as good as you are, whom they look on as an intruder, and, if you could understand them, you would hear yourself cursed for being a Christian. We called on our consul here, Mr. R. Wood, and also went to see the French one, Monsieur Roche, to whom we had a letter of introduction. We made arrangements for amusing ourselves, for here it is necessary to get orders for everything. In the afternoon we returned to Goletta and got a curious document from the admiral to allow us to land in our boat at Carthage. It was impossible to tell which was the top or bottom, it being written in Arabic.

The next morning we started in the gig, with all the photographic apparatus, with our revolvers in our belts, and all the men with cutlasses; for we were told it was necessary to be armed when you go into the country, the Arabs thinking nothing of murdering you if they get a chance. When we landed, some soldiers came down to look after us. We found they could not read a word, and we could not make them understand by signs that one order was of use for more than one person, but we carried up our things to the ruins and began operations, my friend taking those to the south, while I worked more to the north: we each had one of the men to attend to us. I got on pretty well; and when I had done three or four pictures went to see how the other establishment was progressing. "Well, Sam," I said to the coxswain of the gig, "how are you getting on?" "First-rate," was his answer; "think we *shall* lick you to-day." In a minute or two my friend emerged from under the black cover of his dark box, looking very hot; for though it was January the sun was very scorching. I then went back and took a picture of the cisterns, which are very curious. These are nineteen large square chambers, side by side, communicating with each other: they are all arched over, and must have held an enormous quantity of water. We then left off picture-taking, and had an *al fresco* luncheon, and walked about the place. It is very melancholy to see the decay of such a city as Carthage must have been, the very *debris* of the buildings being ploughed up, and corn springing up between the broken bricks and tiles. When we got back to our photographic stations, we found that a Tunisian officer had been down to look at our order again; but of course it was impossible for the men to answer or say anything. We then packed up and returned to our vessel, which was lying four miles off. We had some trouble the first fifty or hundred yards in steering the boat clear of the masses of broken marble, which are just covered with water. In the evening we varnished the pictures with the last of our varnish, and went to bed dead beat.

On the 6th Jan. we met Dr. Davis on the ruins. He had kindly come from Ghomart to show us all there was worth seeing. He has taken a great interest in this part of North Africa for some years, and has been for some time engaged in making excavations on behalf of our Government, and, consequently, knows every nook and corner of the place. He showed us the ancient staircase which led from the Byrsa to the seashore, and also the remains of the sea gates. We had our cameras with us, and took both these places: the latter was rather difficult to take, on account of the loose sandy nature of the soil, the legs of the stand having to be forced some distance into the sand before they would stand steady. While taking the stairs to the sea, my camera was blown over by the wind, but fortunately without receiving much damage. The next morning we printed some copies, two of which we gave to Mr. Roche, the French consul, with whom we had the pleasure of dining in the evening.

(To be continued.)

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held on Wednesday evening, the 26th ult., at eight o'clock, at Myddleton Hall, Upper Street, Islington,—George Shadbolt, Esq., V.P., in the chair.

The minutes of the last meeting having been read and confirmed,

Mr. Samuel Bourne, of Nottingham, was proposed and declared duly elected a member of this Society.

The Chairman then exhibited the photograph selected by the sub-committee for distribution among the members. It was entitled *The Mill.*

Mr. Nicholson exhibited two photographs, by Mr. S. Bourne, by the Fothergill process.

Mr. Hill understood that Mr. Bourne washed freely.

Mr. Nicholson: He did; and employed chloride in the albumen, which, notwithstanding Mr. Shadbolt's objections, he considered might be used with advantage in the Fothergill process.

The Chairman said his objection to chloride was, that he thought the phosphate, or citrate, better. The chloride was better than nothing.

Mr. Nicholson: The great fault I find with the Fothergill is its want of density.

Mr. Hill: I have never found that fault with it.

Mr. Nicholson said he found a want of density in the sky by that process. The chloride obviated that fault. Mr. Bourne had written to him to say that he had tried it and found it to answer best.

The Chairman said, in his opinion, a great deal depended on the collodion used in the Fothergill process. It made a marked difference whether there was a bromide in it or not.

Mr. Nicholson: I find the best collodion for the Fothergill process is old, mixed with some recently iodised.

The Chairman: By that mixture the desired organic change is obtained.

Mr. Hill said he had obtained some very rapid pictures with Ponting's collodion, thinned. The negative looked weak, but printed with great intensity.

Mr. Simpson asked whether any member had heard of a statement that some negatives had been taken in India by the collodio-albumen process, the plates for which had been made ready for the camera twelve months previously. The account appeared in the *Photographic News* of the week before. He had seen them in Horne and Thornthwaite's a short time ago. It was a singular fact that the amateur who took them had never seen a negative before he purchased his camera and went to India. He was directed to follow Major Russell's collodio-albumen process. He washed the film for half-an-hour in water, finally treating with gallic acid. None of his plates were used until they had been ready for the camera four months. On being informed that it was somewhat peculiar for plates to remain sensitive for so long a period, he preserved some for twelve months, when he found that they were still good. That was very remarkable in India, where the extreme heat was so likely to hasten decomposition.

The Chairman said he did not think that decomposition was chiefly brought about by a high temperature, unless at the same time there was a considerable amount of moisture present.

Mr. Simpson remarked that he had thought of that, but still a dry high temperature would have some effect.

Mr. Hill said Mr. Moens had taken several pictures by the collodio-albumen process during his yacht voyage, and he had never found a blister. The only objection to that process was the extra washing.

Mr. Nicholson: Mr. Bourne washed his negatives for fifteen minutes.

The Chairman asked whether Mr. Bourne washed before or after the albumen was used? If after, washing for fifteen days would not hurt it.

Mr. Nicholson said Mr. Bourne washed both before and after.

Mr. Hill: Dr. Ryley remarked that it was utterly impossible to take a picture if *all* the free nitrate of silver were removed.

The Chairman said Mr. Bourne did not remove all the nitrate of silver, but removed as much of the albumen as he could.

Mr. SIMPSON asked whether Mr. Bourne washed thoroughly before the albumen was applied?

Mr. NICHOLSON said he did, and thoroughly washed afterwards.

Mr. HILL: Such thorough washing would prevent stains.

Mr. NICHOLSON: Mr. Bourne did not so thoroughly wash last year, and, in consequence, the plates became quite red on developing, and turned out altogether unsatisfactory.

The CHAIRMAN: I thought the difference might be the result of the presence, or absence, of bromide in the collodion. If the bromide were present it would unite with the iodide salt and form an insoluble substance; but if they used iodide only it washed out, and a good negative would not be obtained.

Mr. SIMPSON: In the latter case the sensitiveness would at all events be much lessened.

Mr. HILL said he had brought some specimens of paper with him respecting which he had had great difficulty. Since the new method of preparing paper came into operation he had not met with any samples of paper so satisfactory as those prepared for the old process, and he had had several cases of "mealiness" occur. He perceived a defect in the paper on which Mayall's portraits of the Royal Family appeared. He found that the albumen came off in several places, and in one case, where he had ironed a sheet with a rather hot iron, the albumen had come off altogether. He had sensitised the paper in a new bath of 65 grains to one oz. of water. Several of his friends had complained of a similar defect. A sort of measly red spots made their appearance, which he thought was owing to the removal of part of the albumen.

The CHAIRMAN asked whether it was an established fact that there was a new method of preparing the paper?

Mr. HILL said the sellers had acknowledged to some of his friends, who had complained, that they had a new method of preparing the paper for the alkaline gold toning process. The reason for the defect was alleged to be the use of too much soda in the toning bath; but he had tried phosphates with no better result.

The CHAIRMAN called attention to the fact that Mr. Hill exhibited a sensitised sheet untoned, so that there could be no dispute on that point, and yet the greater part of the albumen was gone.

Mr. SIMPSON said Mr. Hughes contended that there was no new method of preparation, but that any difference was owing to the paper itself.

Mr. NICHOLSON asked Mr. Hill whether he was sure that his bath was not alkaline?

Mr. HILL said his bath was slightly acid.

The CHAIRMAN remarked that Mr. Sutton had been recently drawing attention to what he called a new method of albumenising by the addition of acetic acid. That was no novelty, for some time ago attention had been drawn by himself to that method. In 1854 or 1855 a Committee of the London Photographic Society endeavoured to ascertain the effect of the introduction of various substances into the albumen for the purpose of getting an even coating of albumen on the paper. The result, in his opinion, was that the introduction of acetic acid was highly detrimental instead of beneficial, whereas the introduction of ammonia materially assisted in getting a good even film.

Mr. HILL said he thought something had been introduced into the albumen to get a greater amount of surface.

Mr. SIMPSON observed that it was strange that Mr. Sutton should call his method a new one, because some years ago that gentleman had given the same method for obtaining an even coating and for avoiding stickiness.

Mr. HILL said some persons were of opinion that the fault arose from the albumenisers being under paid. Now, he gave 12s. per quire for the paper, which allowed a very fair margin for the albumenisers.

The CHAIRMAN said the fact was that amateurs must albumenise their own paper, and show the way first of all, and then they would get professional albumenisers to do it.

Mr. HILL said the paper was made expressly for that process, yet it was not so good as the old paper. The latter, certainly, had not so much surface.

Mr. LANDER said he had met with mealiness, but not through the albumen leaving the paper.

Mr. HILL remarked that in the thicker paper the albumen did not entirely come off, but did so partially.

Mr. SIMPSON said that might be owing to the removal of the artificial surface given by the rolling.

The CHAIRMAN: That is an additional objection to rolling.

Mr. HILL asked whether Mr. Simpson had ever tried acetic acid with the paper?

Mr. SIMPSON stated that he had had paper that smelt of it, but he had perceived no bad effect. Some of his friends had used acetic acid to get rid of the stickiness, but had not succeeded in doing so.

Mr. HILL observed that nine-tenths of Mayall's and Claudet's *cartes de visite* showed signs of mealiness.

Mr. SIMPSON said he had a very strong suspicion that they were not toned by the alkaline gold toning process, as some of them were turning yellow already.

Mr. HILL: Some are turning green. It was said that if the alkaline gold toning process were used these mealy marks would not occur.

Mr. SIMPSON said another point was, that it was not always known by whom the pictures were done, as they were frequently copied, and the copies sold as originals.

Mr. HILL remarked that there was generally a great contrast between the originals and such copies.

The CHAIRMAN said he had been credibly informed that, when it was very desirable to get a portrait of any celebrated character, some people were not very particular whether it was taken from the individual or any person like him. He had been told that there was a man resembling the French Emperor who had been dressed up and put into a suitable attitude, and that thousands of his photographs had been sold as veritable portraits of the emperor.

Mr. SIMPSON: It has been suggested that Rejlander himself should sit as Garibaldi.

Mr. HILL said he had received a letter from a friend at Port Natal relative to using arrowroot as a preservative. He dissolved a portion of arrowroot in boiling water, to which he added alcohol, and he then used it in exactly the same way as the Fothergill process: it answered very well.

The CHAIRMAN said there was another subject they might take into consideration—Mr. Heisch's recommendation to retain the old toning bath instead of the alkaline gold toning process. Mr. Heisch said, in the first place, that the latter could not be better than the former, because pictures toned by it faded. But he had omitted to say, at the same time, that even when thoroughly washed many pictures toned by the old gold and hyposulphite of soda process also faded. That could not be proved with regard to the alkaline gold toning process.

Mr. HILL attributed the fading experienced in the alkaline gold toning process to errors in the fixing, and not to the toning.

Mr. SIMPSON observed that Mr. Heisch only said he did not see that the new process was better than the old. All that Mr. Heisch had proved was, that certain toned prints had faded, but he did not prove what occasioned the fading. Mr. Heisch said that the carbonate of soda and chloride of gold were introduced, whilst in the texture of the paper, into the hyposulphite of soda, and that the decomposition would take place as much in that way as in the old process.

The CHAIRMAN did not consider Mr. Heisch's reasoning good, because it did not at all follow that the same results would follow when the substances came into contact in so different a manner from that in which they did in the old process. Everybody knew the difference between pouring the gold into the hypo. and the hypo. into the gold.

Mr. GARNHAM asked whether iodine had been tried with the hypo.?

The CHAIRMAN said if iodine were mixed with hyposulphite of soda, tetrathionate of soda would be produced. The moment iodine was introduced into hypo. decomposition took place.

Mr. HILL asked whether any person had taken the trouble to question Mr. Heisch's statement?

The CHAIRMAN said he knew somebody who was going to do so.

Mr. SIMPSON observed that one very curious statement made by Mr. Heisch was, that chloride of gold would decompose with hypo., whereas it was the presence of acid in the chloride that produced that effect.

Mr. HILL thought Mr. Heisch must have neglected the washing.

Mr. SIMPSON: Very likely the fading is occasioned by want of care in the manipulation. Fresh hyposulphite of soda ought to be used, not that charged with nitrate of silver.

Mr. HILL said Mr. Heisch appeared to consider the old process more permanent.

Mr. SIMPSON: Mr. Heisch merely suggested the question, as to whether it had been sufficiently well considered.

Mr. GARNHAM said he thought that the old process had fallen into disuse, because it was not treated properly.

Mr. SIMPSON observed that it was very fortunate that it was not treated properly, or else people would have stuck to it, instead of adopting the new method.

Mr. HILL said Mr. Hughes had promised them a paper for their next meeting, but he did not know the subject of it.

The CHAIRMAN announced that the next meeting would take place on the 30th of January.

The proceedings terminated with the usual vote of thanks to the chairman.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Wednesday evening, the 20th December, at eight o'clock, at St. Peter's School Rooms, Walworth,—the Rev. F. F. Statham, the President, in the chair.

Mr. WALL, the Secretary, read the minutes of the last meeting, which were confirmed. He had received from Mr. Bailey some very fine specimens of the waxed-paper process executed by Mr. Hooper. Both these gentlemen were provincial members of the Society, and he wished that such an example was more frequently followed. Mr. Bailey had sent a letter describing part of his process, but the other part not having arrived, the whole would be read on a future occasion.

The CHAIRMAN said that some very beautiful specimens had been placed in his hands by Mr. George, who would be happy to answer any questions the members might wish to ask.

Mr. WALL said that they consisted of copies from engravings, and their peculiarity was said to be due to the use of an iron developer, without any after intensifying.

Mr. GEORGE, in answer to questions, stated that he followed the usual process. The collodion he used was manufactured by an operator at the Crystal Palace. The developer was 10 grains of protosulphate of iron, 1 ounce of water, 10 drops of acetic acid, the same quantity of alcohol, and one drop of ammonia fortis. He should state that in making the bath he neutralised it with a small quantity of caustic potash—say 1 drop to about 6 ounces of the solution. He could get the negatives so intense by the developer he employed that it was impossible to print through them. He also used the acetate of ammonia.

Mr. HUGHES said the merit did not belong to the developer, but was due to the character of the collodion.

Mr. GEORGE said he had used that developer with other collodions with a similar result.

Mr. HUGHES was convinced that the strength of the negative was obtained, not in consequence of the developer, but in spite of it.

Mr. SIMPSON gave it as his opinion that the collodion and bath produced the effect, not the developer.

The CHAIRMAN said they were then to resume the discussion upon Mr. Fry's paper *On Instantaneous Photography*, which was read at the last meeting, when the further discussion upon it was adjourned.

Mr. HUGHES then read a paper upon that subject, entitled *Art-Photography, and how far Composition-Printing is capable of Aiding its Cultivation* [see page 5], and exhibited some photographs by Mr. Mudd, of Manchester, illustrative of his remarks.

At its conclusion, the thanks of the meeting were very heartily tendered to Mr. Hughes for his paper.

The CHAIRMAN said he could not altogether agree with some of Mr. Hughes's deductions; neither did he quite concur in the blow he sought to aim at the process of printing from several negatives. It was, however, certain that both Mr. Fry and Mr. Hughes had a common aim, namely, to approach as nearly as possible to the beauty of nature. The question was, not whether they were at liberty to use several negatives for the purpose of obtaining a number of skies to be printed into their pictures *ad libitum*, but whether they might not take one negative of the view and, at the same time, take another of the sky, which being there in nature must be suitable and appropriate to the view. Of course the condition of the atmosphere ought to be adapted to the rest of the picture, and the extreme case, mentioned by Mr. Hughes, of an April sky over a sea view taken on a hot summer's day, must immediately strike any one as being inappropriate. But a negative of the sky, taken about the same time with that of the view, he should consider to be legitimate.

Mr. WALL said he thought Mr. Hughes's paper, in words of prose, contained some very beautiful poetry. In some of his remarks, however, he did not concur. It was possible to take a sky almost at the same time with the landscape, and thus obtain a truthful result. The picture by Mr. Mudd, then before them, contained such a series of gradations from the foreground to the horizon, that anything more forcible than the faint floating vapours blending so tenderly with the delicate softness of the distant mountains would be out of place. A dark sky with heavy clouds, for instance, would suffice to drive out all the sentiment and poetry it was in its present state so full of. He had prepared a few remarks upon Mr. Fry's paper, which he would then read. [See page 8.]

Mr. HOWARD ventured to suggest a method of obtaining a pleasing effect, particularly in large pictures, when the outline was of a very abrupt nature, as when there was foreground foliage, or anything similar, against the sky. The method he referred to was by unequally developing the picture. After developing, the plate should be washed free from the action of the developer, and then the developer poured on again, over the foreground, and then it should be allowed to flow over certain portions of the sky only. That produced a softness in the edges, and might, in the hands of a skilful operator, be much improved upon.

Mr. HUGHES said, in reference to the remarks made by the President and the Secretary, that he did not, of course, expect that his views, which were so entirely hostile to the received opinions of the day, should be concurred in. He had taken, in his paper, some extreme cases to illustrate his point; but it was better to arouse attention by showing cases of error, so that a more artistic feeling might arise among photographers. Their Secretary had suggested a method of obtaining the sky harmoniously with the view, namely, to take it as soon afterwards as possible. That was certainly the next approach to the natural mode. But the whole tendency of his paper was to drive them out of mechanical details, because the man who rested upon crutches would never have the use of his limbs. It was toiling in the wrong direction. Observe the quiet unobtrusive manner of Mr. Mudd, who, taking advantage of an accidental defect—the sky printing through—exhibits his skill in turning this defect into a beauty. His method was certainly more applicable in some cases than in others. He had seen a good many of Mr. Mudd's pictures—and they would see more in the forthcoming Exhibition—and his tendency in all was to reduce the sky, to keep it down, and to soften it into harmony. He (Mr. Hughes) had selected the pictures now before them as specimens of his style. They would notice in one of them how exquisitely the eye was led into distance. On seeing it he had said to himself:—"Supposing we have not that extreme delicacy of distance, but a bold vigorous subject, how would he (Mr. Mudd) treat it?" He then selected the second picture where there was only foreground, so that they could see two entirely opposite subjects treated in the same manner. It was a dreamy, misty, soft, cloudy, quiet effect, decidedly in consonance with the view. A gentleman wrote to him a short time ago that he had been amusing himself by taking some cloud pictures that he was going to print with some negatives he had taken during the *summer!* Thus, if they did not take care, instead of fostering artistic landscape photography, they would, by encouraging the practice of printing in skies from "stock" cloud negatives, degrade and vulgarise it. His great object was to call the attention of the photographic world to the cultivation of true artistic feeling, and not to be deceived by any feats of photographic-legerdemain printing, which at best is but a delusion and a snare. The strength of photography exists in its inexorable truth, and we should watch with jealousy anything calculated to compromise or trifle with this vital quality.

Mr. WALL entirely agreed with Mr. Hughes as to the proper object they ought to seek; and that they must not rest satisfied with pleasing vulgar taste, lest able photographers should rest on their oars. But they must not throw away their crutch until they were strong enough to walk alone. For his own part, he would much rather have a "printed in" sky than the bare white paper. In that he differed from Mr. Hughes. The fact that Mr. Mudd took such great care to keep out any jarring discord from his pictures was a proof that he was an artist. But in a grand, turbulent, rocky scene, with leaping water flashing and roaring, a quiet, tame, and calm sky would be out of place. When Mr. Hughes held up the second of Mr. Mudd's pictures, he (Mr. Wall) at that distance could see nothing but a row of three dark spots. This arose from a want of breadth, which a darker sky, by uniting these three masses, would have secured, and would, moreover, have harmonised better with the character of the subject. A picture ought to be suggestive of artistic beauty even before it could be distinctly seen. He had a tender reverence for such a photograph as that, and it gave him a pang to point out any defect in it.

Mr. HUGHES said Mr. Mudd had a horror of any strong melodramatic effect; but he certainly should like to see him carry his method a little further. He had omitted to state that these photographs were all taken on dry plates, so they had there evidence of what the dry plate might effect. They were excellent examples of delicate manipulation.

Mr. LEAKE said his remarks would apply more to the manipulation than to theory. He perfectly concurred with Mr. Fry's remarks as to the wet process: it was unrivalled for sensitiveness and certainty. He also objected to "white skies," and did not like them at any price. Mr. Fry had stated that he sometimes used the negative bath as strong as 50 grains to the ounce. Now, he thought that was too strong, and that it should never be more than 40 grains to the ounce. Mr. Fry had also said that he made the bath slightly alkaline, but in his (Mr. Leake's) opinion it would be impossible to produce a picture with it by the wet process at any rate. He considered that the collodion sold as positive collodion gave much better effects than that sold as negative collodion, when used with an iron developer. He wished to know Mr. Fry's reason for using the hydrosulphate of ammonia process for intensifying. He thought the process, with a solution of iodine, and subsequently with pyrogallic acid and silver the best. He would suggest that the clouds be printed rather more slightly, as they seemed to him too strong, thus making the pictures look heavy.

Mr. FRY observed, with respect to the use of hydrosulphate of ammonia, that since reading his paper he had come to the conclusion that a weak solution of iodine would be preferable, as the hydrosulphate of ammonia gave rather a yellow look, whilst a weak solution of iodine was more delicate in its effects. With reference to the strength of the bath, he begged to say that he did not use a 50-grain bath from choice, but because the pictures were very apt to spot, and must be kept in the bath only a short time: 40 grains was the maximum strength for ordinary purposes. In speaking of using the bath alkaline, he only meant it to be so very slightly alkaline as to be scarcely perceptible, and not even that from choice. If Mr. Leake would look at his paper he would find he stated that he had occasionally found his bath alkaline, and that he had remedied that by an excess of acid in the developer. He had only said that the bath, if anything, should be slightly alkaline, but, if possible, it should be neutral. If he found the bath decidedly alkaline, he should add nitric acid. With respect to Mr. Hughes's observations, he agreed with him in the main point, but he should decidedly take exception to some of his remarks. As a literary production he could not speak too highly of it. Mr. Hughes commenced by saying that the higher our state of civilisation the more we should like pictures. Now, Dr. Johnson was a highly civilised man, and yet he hated pictures.

Mr. HUGHES: But some people called Dr. Johnson a "literary brute."

Mr. FRY: Mr. Hughes said that the use of several negatives to produce one picture was a confession of weakness. Now, that was exactly the reason why Mr. Rejlander and himself used several negatives—on account of their weakness. If they could produce their pictures with one negative, they would not use more. Where he had been successful with one negative, he had looked upon it as a triumph; and he trusted that the day would come when they should be able to produce their effects with one instead of more plates. But the white sky had been remarked upon by art critics, if not in derision, with commiseration. An attempt to produce the natural sky, even if not absolutely successful, must be looked upon as a move in the right direction. He had stated his process for the purpose of calling forth at least the comments of photographers, as he was desirous they should point out its defects. He

thought that the little sky printed in by Mr. Mudd's process was an improvement, and that the white sky was not to be compared to it. He did not object to any remarks that might be made, and he was open to receive any opinion that might be given upon his process. With respect to what Mr. Hughes called "stock" or "property skies," to be used indiscriminately, he deprecated them as much as Mr. Hughes did. If he had "property skies" he did not print in the first that came to hand, although he had "property skies," and was very proud to show them. However, he did not thrust them into every negative indiscriminately. Mr. Hughes remarked that a different kind of sky was required for each view: he perfectly agreed that the sky ought to be suitable to the rest of the picture. Mr. Hughes, as a proof that the sky and sea could be taken together, referred to Mr. Le Gray's pictures. Now, he thought it only fair to state that some of that gentleman's pictures appeared half made up. He did not say that they were so always, but he was sure they were frequently. He was quite sure that the sky was printed in separately, as he had been examining some of them the day before. Mr. Hughes had also alluded to pictures where the sea and clouds were taken together, which he also approved of. With respect to Mr. Kemp's dry-plate pictures, he had never seen them, but he had himself exhibited, at the last exhibition, pictures of the sea and sky taken on dry plates. He (Mr. Fry) fully appreciated the remark that glaring incongruity ought to be avoided. He also wished to say that clouds might be printed in too deeply, and so mar the effect of the rest of the picture. He did not agree with Mr. Hughes that a blank sky was better than one "printed in."

Mr. Hughes corrected the speaker by remarking that he said a blank sky was better than a badly printed in one.

Mr. Fry agreed with him so far. With reference to what Mr. Wall had said about the want of absolute instantaneousness in some of his pictures, that might be the case in some instances, but he now produced one taken in the same way with which such fault could not be found. The waves were there standing up, and each drop was distinctly rendered.

The Chairman said he thought such discussions as that just concluded would be of great advantage to the advance of their art: it showed that they were seeking perfection—to have every adjunct as perfect as possible. He thought, with Mr. Hughes, that they might hereafter be able to perform at one operation that which now took two or more; but he thought until that point was obtained it was better to produce the best effect they could with the means they then had.

Mr. Wall said the Experimental Committee had sent in a report of their experiments, which was to have been read that evening; but, as it was so late, the Secretary of the Committee (Mr. Hannaford) thought, as there was nothing in the report requiring discussion, it would be better to lay it on the table, and that it should be considered as read. The members would have an opportunity of seeing it in The British Journal of Photography, the official organ of the Society [see page 9], and any discussion upon it had better be adjourned to their next meeting.

A resolution was then moved and carried in accordance with Mr. Wall's suggestion.

Mr. Leake here made a suggestion to the effect that the method of taking two negatives on one plate for album portraits might be adopted to take two negatives, one of the landscape and one of the sky, in such rapid succession, that it would amount practically to taking the sky the same time as the landscape. There could be no incongruity in printing in a sky so taken.

Mr. Ackland, V.P., proceeded to read a paper *On the Optical Principles Involved in the Construction of Lenses*, illustrated by various diagrams and instruments. [See page 3.]

The Chairman, in moving a vote of thanks to Mr. Ackland, said their discussions ranged from practical to theoretical, and then back again to practical. Mr. Ackland's paper was of great value, not only to those present, but to persons at a distance, especially those in our colonies, who could not go to shops when their instruments were defective to have them repaired. It was valuable, as Mr. Ackland had laid before the public that which was previously called "a trade secret," whether rough or otherwise he did not care to say, as he should be very loathe to use a word that appeared to have given offence. The method was sanctioned by the name of Dr. Wollaston, one of our most eminent opticians and chemists. He, however, did not consider it either rough or complicated.

The thanks of the meeting were then voted to Mr. Ackland for his paper.

Mr. Hughes said this was scarcely a proper time of the evening to consider adequately Mr. Ackland's paper, and how far they could take advantage of the means which he had presented them with. He was particularly glad, however, that the paper had been read, as it put Mr. Ackland in a proper position. He had been laid open to many invidious expressions; and he had much pleasure in saying that now there were not the faintest grounds for supposing they could apply. Since the question had been started he had compared notes with several practical opticians, and one of the first means suggested for ascertaining the accuracy of the position of single lenses was the ordinary method stated in the Journal; but, where several lenses were used, in combination, he was told to look through them at a fixed light and to see if all the images, reflected from the various surfaces, were in a line or not. If the images were all in a line the lenses were concentric, but if otherwise, they were out. Thus the subject was much more generally known than the Vice-President gave the world credit for, but whether there was the same appreciation of it he was not prepared to say. But accuracy in centering was not the only thing a lens ought to be tested for; for in looking at one the other day he found it to be very bad, although it was as accurately centered as possible.

Mr. Ackland said he was quite aware of that, for in making a short focus lens the other day a workman overheated it in fixing the balsam. Although they could find no fault with its position, it was perfectly useless; for on placing it under polarised light it was found that the annealing had been destroyed, and it had to be thrown away.

Mr. Hughes said it would be a great pity if they were to set up any one test for lenses, as photographers might be apt to condemn a lens merely because it was not concentric, and to attach great merit to it if concentric. But in the particular case to which he referred the lens, although well centered, was bad. In other cases good lenses might be badly centered. Photographers, therefore, ought not to condemn lenses for this fault only.

Mr. Wall said with regard to their Vice-President's paper having put him in a proper position, it might be argued that the alleged secret being so well known it might be absurd to call it a secret. But he thought that Mr. Ackland, finding so many lenses badly centered, was justified in supposing that even if his simple method were known it was at least not practised.

Mr. Dallmeyer hoped he would be permitted to say a few words upon the subject, having been invited, although he was not a member of the Society. With reference to an observation of Mr. Hughes's, he begged to say that he quite endorsed his remark to the effect that a lens truly concentric was not to be regarded as a perfect instrument on that account. It was not by any means the most difficult operation to centre a lens truly; but it was far more difficult to grind one with true spherical surfaces, and not only that, but to be of such form and under such conditions as to produce an instrument giving perfect definition both at the centre and margin of the picture. A lens might be truly centered, and yet be far from a perfect instrument. Mr. Ackland would doubtless have experienced this in the manufacture of telescopes which magnified as against photographic lenses which diminished the objects. A telescopic object-glass with perfectly spherical curves, and otherwise corrected, even when not truly centered, gave better definition than one in which the curves of the lenses were not perfectly spherical—were better centered. Therefore photographers should not alone regard the centering of their lenses—which, by-the-bye, he did not regard as a secret, and therefore did not think that Mr. Ackland had conferred so great a boon upon opticians generally, because he found that, with that method, after all, the matter must be referred to the lathe. For when Mr. Ackland had discovered by the position of the reflected images that one of the lenses was out, it did not show that the defect was owing to a want of centering of the lens, as it might be owing to a fault in the brass-work; therefore, he must go to his lathe, fix the tube, and see where the defect lay. With respect to Mr. Ackland's method of centering his lenses he did not think that plan a good one. All the lenses made by his late father-in-law, Mr. A. Ross, were centered, at one time, in the lathe, in the manner described as adopted by Mr. Ackland for the crown lenses; but when mathematical accuracy was required that plan was not sufficient. No person could by hand move a large glass so as to obtain both images perfectly stationary when revolving in the lathe; and even if it were obtained, it would only remain so for an instant, for the pitch holding it, being still warm, would, in a measure, yield to the weight of the lens, or by its own contraction destroy its centricity. Therefore it became necessary to have what he had adopted, namely, an eccentric universal chuck, which permitted of motion in vertical and horizontal planes when in the lathe. It was by that means, with fine adjusting screws, that he attained perfectly concentric lenses. He used that for the larger lenses, but believed it unnecessary for the smaller. He had stated enough to lead photographers to believe and consider that the merits of a lens did not consist in its being truly centered alone—however important he might admit that to be—but that they should rather look upon perfect definition. If they focussed for the eyes of the sitter in the picture, they should be well defined on the plate; and if they were well defined, and the margins appeared sharp, they might rely that the spherical and actinic correction of their lens was perfect.

A vote of thanks to Mr. Dallmeyer was then unanimously carried.

The Chairman said he was glad to hear that there was a method of obtaining mathematical accuracy in centering lenses. That was in his mind at a previous meeting when he used the word a "rough" method. He thought the method of looking at the images to see if they "wobbled" or not *was* a rough method; and he thought some more mathematical method—such as that now described—would be necessary to ascertain its really true centering. He trusted that this discussion would remove any unpleasant feeling any remarks, either in The British Journal of Photography or elsewhere, might have given rise to. Their object ought to be to invite comments, and they could very well bear to have criticisms made on their remarks, as they were made for that purpose; and if, by a slip of the tongue, they might transgress a little, and draw down editorial criticism, they must bear it. Their discussions were open to comment, and rightly so; and they were obliged to the kindness of the editors who thought them worthy of attention. He was quite sure that any remarks made by Mr. Shadbolt were made in good humour, and that they would never give rise to any other feeling on the part of the members of the Society.

Mr. Ackland said Mr. Hughes had called attention to the fact that photograpers must not look to the centering of their lenses too much. Now he said photographers had several things to look to, and the centering was an important one. Mr. Dallmeyer had mentioned the fact of centering lenses by a universal chuck, which was certainly very good in the case of large lenses; but the plan he (Mr. Ackland) recommended was applicable to all lenses, large or small, and his workmen got a better result than they did formerly. They could not get workmen to do it in any other way. Here was something the workman saw,—he was told the image must not move. He found that out of 20 lenses, 18 or even 19 were as perfectly centered as he could expect. He could not get that by the ordinary mode of centering.

Mr. Dallmeyer said he did not dispute the facility of Mr. Ackland's process, but it depended on the honesty and efficiency of the workman employed. Supposing Mr. Ackland found, by passing his lens under the lever of his machine, that one of the edges was thicker than the other, it was then for the workman to grind it accurately, and generate a new curvature from a different centre, when the rings would be ground out. He did not mean an alteration all over, but an eccentricity in the curves, when there would be nothing to guide the workman. Eccentricity was often caused by the glass being scratched by the emery, which caused the workman to polish it unevenly in trying to work the scratch out. All such errors could be more readily detected in the lathe. He had not much faith in Mr. Ackland's method as regards accuracy.

Mr. Ackland said he always kept the rings at the edges to guide the men in polishing.

Mr. Dallmeyer: Still Mr. Ackland trusted to their eyes.

Mr. Ackland said he did not admit that the workman was to polish one side more than the other. No difficulty could arise except in cases where the emery had scratched the glass. He never regarded the lenses as perfect that had been re-ground.

Mr. Dallmeyer said he generally found lenses that had been re-ground and re-polished better than those which had been only once ground and polished. The second time generally a better figure was obtained. It frequently happened on the first grinding that convex lenses took the form of an oblate spheroid, while concave ones approached to elliptic forms.

Mr. Bowden and Mr. Quin were then proposed and declared duly elected members of the Society.

Mr. Wall announced that Mr. Thomas Burr would read a paper *On the Application of Photography to Astronomy, Magnetism, and Meteorology*, at their next meeting.

The proceedings terminated with the usual vote of thanks to the Chairman.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at Eight o'clock, on Monday, the 17th ult., at the Golf Club House—Charles Heisch, Esq., the President, in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman said Mr. Heath, who was unable to attend at the last meeting, was now present, and would give them a very interesting account of the manner in which he had obtained direct positives in the camera. He had also been kind enough to bring several very beautiful stereographs by M. Soulier.

Mr. Vernon Heath said he did not think his communication was of so much importance as Mr. Heisch supposed. In taking a copy of a medal he had accidentally obtained a positive instead of a negative. Some time ago he was requested by Mr. Conyngham, of the Foreign Office, to make photographic copies of a medal just then received from Italy, struck by the direction of that truly illustrious man, Garibaldi. That medal he was enabled, by the kindness of Mr. Conyngham, to lay before them. [The medal, which was gilt, had a fine head of Garibaldi on the obverse, and an inscription within a wreath on the reverse.] It was interesting as being a medal struck by Garibaldi to give to his chief officers, and to any other persons who might merit it. He had had considerable experience in copying by photography drawings, manuscripts, and engravings, and he had always inverted them—a method commonly adopted for the purpose of focussing with greater facility. Without due reflection he reversed the medal, whereby the positions of the lights and shadows were altered, and the result was a direct positive.

Mr. Harding asked what Mr. Heath meant by reversing the medal?

Mr. Heath said he meant turning the head upside down, whereby instead of a light on the top of the head there was a shadow. The source of illumination being from above, a negative would be produced in the ordinary way if the medal were placed with the top of the head uppermost; but if reversed the result must be a positive.

Mr. Glaisher asked whether the result must always be the same in objects of that class?

Mr. Heath said the result must be the same where the subject was in relief. As negatives often, and in fact generally, were better than the positives taken from them, this method of obtaining direct positives might be useful under certain circumstances. It had since struck him that a discussion might arise as to whether from such a positive a negative might not be obtained, from which better positive prints might be taken than could be got from negatives taken in the usual way. In order to illustrate his proposition he had brought a negative taken in the usual way and a direct positive taken from a reversed medal. It would be perceived that in the former there was an exaggeration of the shadows, a kind of double line down the profile, which was avoided in the latter. That exaggeration must occur in taking a negative in the ordinary way, unless the source of illumination were very accurately placed with respect to the object. The exaggeration in the negative he produced was owing to the source of illumination having been somewhat on one side; but when the medal was inverted no ill effects were perceptible, even in the case of the source of illumination not being accurately placed. The positive he produced had all the qualities necessary to give a good negative. This was all he had to say upon the matter, and he was afraid his communication was not of so much interest as their President supposed.

The Chairman said it was true that Mr. Heath had, he might say, stumbled upon this discovery accidentally, but it was none the less valuable for that; and all he could say was, that it required a good man to observe upon, and to make the most of, these accidents. The discovery might turn out to be of great value in taking objects in relief where the convenience of a glass house, with its blinds and other appliances for controlling the illumination, was not to be had.

Mr. Heath said there was usually some difficulty in obtaining good tones in positives on glass by the ordinary method of printing from negatives on dry plates; but in this case he had obtained a direct positive with ease which in tone more resembled M. Soulier's positives, the process for producing which was a secret.

The Chairman said Mr. Heath's direct positives certainly possessed qualities which he had seldom seen in positives printed on glass. Had Mr. Heath ever tried, by that method, to take objects in much higher relief?

Mr. Heath said he had not. He had taken the reverse of the same medal with similar success. It might be interesting to state that the positive was taken with a small orthographic lens, and that the copy was much larger than the medal.

Mr. Glaisher inquired the focal length of the lens?

Mr. Heath said twenty inches for copies enlarged to that extent.

The Chairman said he believed twelve inches was the focal length for ordinary landscape work.

Mr. Heath said he believed about thirteen inches.

Mr. Glaisher said Mr. Heath's method was very simple, but the idea had never occurred to him: it might prove of great importance.

The thanks of the members were then voted to Mr. Heath for his communication.

Mr. Heath then called attention to the views from Windsor Castle, Buckingham Palace, &c., exhibited by him, and taken by M. Soulier, whose name, he said, was sufficient to guarantee their excellence. The circumstances under which they were taken were these:—In February last the Queen asked whether M. Soulier would photograph those places, and upon what terms. He (Mr. Heath) proposed that M. Soulier should go upon the terms of obtaining permission to take and publish the views. M. Soulier was only too happy to assent to his proposition, and with Her Majesty's consent he was now publishing a number of the photographs he had so taken. They were all, he believed, printed by artificial light. The interiors were particularly remarkable, when the comparatively small amount of light in the rooms at Windsor Castle was taken into consideration. M. Soulier was engaged there from June to October. They were all taken on dry plates by the Queen's express stipulation, as pints of solution of cyanide of potassium had been previously expended upon the staircases and floors in removing the stains left by the practitioners of wet processes, and Her Majesty said she would have no more wet processes carried on there at all.

Mr. Glaisher inquired if Mr. Heath knew whether M. Soulier's success depended on any peculiarity of process, or only on perfect manipulation?

Mr. Heath said he did not. He thought it was partly due both to manipulation and process. M. Soulier and his sons let no person into their secret. He knew one house that had undertaken to take 4000 of these photographs before Christmas Day.

The Chairman inquired at what rate M. Soulier could print them?

Mr. Heath said he must print them very quickly. Within a week after M. Soulier arrived in Paris with his negatives he had sent 800 copies to London.

The Chairman said perhaps he doubled his negatives.

Mr. Heath said, from the sharpness of the positives, it was quite possible to take very fine negatives from them, and many persons had done so; but they were unable to produce the beautiful effect obtained by M. Soulier in his positives, although the negatives were very good. His impression was, that M. Soulier's negatives were four or five times larger than the positives, and that they were reduced in the camera.

The Chairman said, from the position the operator must have been in when taking the views he did not think that was possible, being so close to the objects he was photographing. He must have used a lens of very short focus, and it was easier to obtain such an one perfect of a small size.

Mr. Heath, in answer to a question, said single copies were seven shillings each.

The Chairman asked whether Mr. Heath had ever seen M. Soulier's negatives?

Mr. HEATH said he had asked M. Soulier upon one occasion to let him see them. M. Soulier was very civil, but did not show them.

The CHAIRMAN said he should much like to see them, as he had a strong suspicion that they were what would generally be called very much overdone.

After some desultory conversation,

Mr. HEATH said, with regard to the rapidity of printing now practised, he might mention that one house had undertaken to purchase 60,000 of the *cartes des visites* of the Royal Family in twelve months, but they had in fact taken 70,000 in less than three months, and they had orders on their books for 200,000 more copies. From the great rapidity of this printing. he was afraid we should have large numbers of "fading" photographs. He had been trying to get together some interesting facts relating to printing, which he trusted would prove useful. He always let his own photographs lie in running water twenty-four hours, and then gave them three spongings, all of which occupied much time, but he did not think stability could be insured without it. He had some he took in 1848, which had shown no signs of fading.

Mr. GLAISHER said he adopted the same course of washing and sponging with the photographs at the Observatory. The Venetian photographs were all gone.

Mr. HEATH said, so were Robinson's Constantinople photographs. It might have something to do with the condition of the paper used.

Mr. GLAISHER said one curious fact with respect to paper came within his knowledge. He had a ream of paper in the Observatory with which he had succeeded very well at first, but it gradually became worse, until at last he could get no impression at all. Ultimately he discovered that the defect arose from the paper having been kept in a room at the Observatory where gas was burning night and day.

Mr. HEATH asked whether the paper was sensitised?

Mr. GLAISHER said it was not. There were six or seven gas-burners constantly alight in the room.

The CHAIRMAN said he supposed the sulphuric acid generated by the burning gas was the cause of the evil, especially as the Greenwich gas was sometimes very bad. He had 1lb. of sulphate of zinc taken from a pipe used to carry off the fumes from one burner at the Observatory, the whole of which had collected in six months.

After some further discussion, the proceedings terminated with the usual vote of thanks to the chairman.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

AT the close of last meeting of this Society, reported in our previous number, Mr. Tunny said that the members might not be aware of the existence of a developing agent for collodion negatives, which he had often tried, and by which more curious and, in many cases, better results might be attained than by any other developer extant. He alluded to a combination of pyrogallic acid and iron, which he thought might not be inaptly named a gallo-citrate of iron, and which he made in this way:—Fifteen grains sulphate of iron having been dissolved in one ounce of water is added to another ounce of water containing two grains of pyrogallic acid in solution. A copious precipitate of gallate of iron is formed, which is re-dissolved by adding *quant. suf.* of a saturated solution of citric acid in water. Those who try this will find that for a short time no apparent development takes place; but they will be agreeably surprised by the picture subsequently starting into existence in a most instantaneous manner. When this takes place the development is *completed*, no further length of time seeming to add to its density. Mr. Tunny urged on the members to try this. So far as he was aware it was quite new, at least he had never seen mention made of it in any of the periodical or other literature of photography.

In connexion with the report of this Society in our last number, we made an editorial comment, in consequence of which we have received the following:—

Edinburgh, 26th December, 1860.

DEAR SIR,—I think merit would have been fully better awarded if you had turned up the number of the Journal, and given the date and the name of the gentleman who "had forestalled me in the application of citric acid for clearing the discoloured albumenised paper silver bath." If citric acid has been used for the above purpose, priority of publication, by so doing, would have been established; but, on the contrary, if your memory has been at fault, I conceive your note to be rather injudicious.

Your obedient Servant, J. G. TUNNY.

[An editor, in trying to avoid Scylla, very often falls a victim to Charybdis. On a former occasion we accidentally omitted to make a note of a fact which occurred to us in connexion with albumenised-collodionised plates coagulated by hot water, and consequently became figuratively immersed therein. Mr. Tunny's paper reached us but a very short time prior to our "going to press;" and we cannot pretend to remember exactly dates, places, and names of people, so as to give the when, where, and who, relating to matters of fact of which we take cognisance more definitely without reference. We have, however, now sought for the missing particulars, and have to refer to the *Journal of the Photographic Society* for 8th January, 1859, No. 76, page 138, where is an article, by Mr. Fras. G. Eliot, of which this application of citric acid is the theme. Finding that the free citric acid rendered it difficult to permit the red colour being sufficiently subdued in the subsequent toning bath, Mr. Eliot carried his experiments further, and gave the following directions for restoring the bath to a proper working condition, viz.:—"Evaporate to about fifty or sixty grains to the ounce; add citric acid in solution, any strength, until precipitation ceases; then add ammonia until the reddened litmus is restored to its proper colour; filter, and afterwards add nitric acid, two drops to the pint." We had no intention of accusing Mr. Tunny of plagiarism (indeed we do not consider that our note admits of this interpretation), and have no doubt that the idea was original so far as he was concerned; for he may well have overlooked Mr. Eliot's very modest paper, which was *not* brought forward at a meeting of any society.—ED.]

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting of this Association was held on Wednesday, the 12th ult., at the Chorlton Town Hall,—Mr. William Griffiths, one of the Vice-Presidents, in the chair.

The minutes of the last meeting were read and confirmed.

The SECRETARY objected to that portion of the report which was virtually an amendment on the previous one; the report, as sent by him to THE BRITISH JOURNAL OF PHOTOGRAPHY, was what he understood Mr. Sheard to say at the previous meeting. He did not wish to say more about the matter, only that he did not admit having reported incorrectly.

Several members expressed their opinion as to the correctness of the original report.

The CHAIRMAN said several of his friends had tried the process, as brought before the last meeting by Mr. Kay, for converting positives into negatives. Very successful results were obtained, and he could recommend this mode to the members. He then read a letter from the *Manchester Examiner and Times*—showing how lightly photography was treated by some persons who had no knowledge of the art—the correctness of which he could not endorse.

A MEMBER wished to inquire from the meeting if it were necessary to prepare collodio-albumen plates in darkness, as he had prepared some in open daylight, up to the second sensitising, and found they were good.

The meeting thought there was no new feature here; but had the development been continued longer, fogging would have supervened.

Mr. ROGERSON said he wished to read some papers, and a letter already published, on dry processes, by Dr. Hill Norris, in 1857.

Mr. GRIFFITHS also read some extracts bearing on the same subject.

A very interesting discussion then arose on the sensibility of iodide of silver in its various forms, and was continued until the close of the meeting, which was concluded by a vote of thanks to the Chairman.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VIII. *(Continued.)*

WE have now, I think, quite disposed of the necessary implements materials, &c., and may begin practice—in the first place choosing as may best suit our purpose,—

THE PHOTOGRAPH, &c.

It should be a good print, but not a dark or a feeble one. The whites must be pure—the half-tints good—the tone warm. It should be printed upon *good* albumenised paper, and mounted upon thick, hard drawing-board, which has been hot-pressed. Salisbury glue is sometimes used as a size for its preparation. Newman's preparation size is frequently preferred; but I use isinglass dissolved in a very small proportion of water, by heat, strained through coarse linen, diluted with gin, and applied, while perfectly liquid, with a broad flat brush. Once on the picture this forms a hard protective surface not likely to be influenced either by moisture or heat; but if it is applied too thickly it may crack off. Having sized the print it should be hot-pressed.

You now take it into your painting-room, which has been well dusted, and fasten it to your desk with drawing-pins, while I proceed to speak of—

PREPARING THE PALETTE.

The late excellent artist, Leslie, said "he hated a starved palette," and I subscribe to this great man's opinion; but beware of a dirty palette, with no one colour pure or distinct from another. You require a very small portion of each pure pigment, just a mere touch from the mouth of your squeezed tube, and from these may compound your tints and hues at will. It is usual with those who paint large pictures to set the palette differently for each painting; but for ordinary photographs once setting the palette will suffice, if the palette be a tolerably large one, so as to afford you room enough for both the pure and mixed colours. No two artists may

be said to use exactly the same set of tints and hues—preference, feeling, and individual peculiarities of practice having much to do with the selection.

Setting the Palette.

Place the pigments on your palette, as described, in the following order, leaving some little space between each, in order that they may not, during work, become mixed and soiled:—

White,	Vermilion,	Cobalt Green,
Naples Yellow,	Madder Pink,	Terre Verte,
Cadmium Yel. (1&2)	Rose Madder,	Raw Umber,
Yellow Ochre,	Indian Red,	Vandyke Brown,
Raw Sienna,	Madder Purple,	Cappa Brown,
Gold Ochre,	Cobalt,	Ivory Black,
Burnt Sienna,	Ultramarine,	Blue Black.
Light Red,	Prussian Blue,	
Extract of Vermilion	Indigo,	

Tints for Flesh.

These are very numerous; but I select such as may be most frequently used: modifications will readily suggest themselves to you during your practice.

For Fair Complexions.
- White and Naples Yellow.
- White, Cadmium Yellow, and Madder Pink.
- White, Light Red, and Cadmium Yellow.*
- White, Vermilion, and Light Red.

For Darker Complexions.
- White and Yellow Ochre.
- White, Yellow Ochre, and Light Red.
- White, Burnt Sienna, and Madder Pink.
- White, Indian Red, and Yellow Ochre.

For Ruddy Complexions.
- White, Cadmium Yellow, and Light Red.
- White and Light Red.
- White, Light Red, and Madder Pink.
- White and Rose Madder.
- White and Indian Red.

For Half-Tints to break the above.

For Fair Complexions.
- White, Cobalt, and Venetian Red.
- White, Cobalt, Ochre, and Madder Pink.
- White, Black, and Vermilion.
- White, Indigo, and Venetian Red.
- White, Light Red, and Emerald Green.

For Darker Complexions.
- White and Terre Verte.
- White, Black, and Yellow Ochre.
- White, Black, Indian Red, and Raw Umber.

For Ruddy Complexions.
- White, Cobalt, and Venetian Red.
- White, Black, and Vermilion.
- White and Purple Madder.
- White, Rose Madder, and Ultramarine.
- White, Indian Red, and Indigo.

Carnations.

For Fair.
- White and Vermilion.
- White, Vermilion, and Madder Pink.
- White, Rose Madder, and Light Red.

Darker.
- White, Cadmium, and Madder Lake.
- White and Indian Red.
- White, Rose Madder, and Burnt Sienna.

Ruddy.
- White and Rose Madder.
- White, Rose Madder, and Indian Red.
- White, Vermilion, and Lake.

Shade Tints.

For Fair.
- Raw Umber and Light Red.
- Madder Brown and Raw Sienna.
- Vermilion and Black.

Darker.
- Indian Red, Raw Umber, and Black.
- Madder Brown and Lake.
- Vermilion and Black.
- Vandyke Brown and Lake.

Ruddy.
- Same as above, but with the Reds predominating.

Before proceeding, let me give a few hints with reference to the use of these tints. In the first place, *recall the remarks upon flesh painting already given, and bear them in memory while compounding the tints and hues given in the preceding tables.* The great difficulty, and it is indeed a puzzling one, in teaching through such a medium as the present, lies in this fact, that although you may give the pigments which enter into combination for the production of a given tint, hue, or shade, you cannot so easily convey an impression of the exact degree of warmth or coldness, depth, &c., which is desirable. I may, as many do, call this a cold and that a warm colour, by way of making you understand the exact nature of the colour I wish produced; but, then, this may be warm and that cold rather in a comparative than in a general sense, or it may possess just a certain degree of the one or the other, and that only in reference to the harmonious relationship it ought to bear to those previously applied. All I can do for you, unless you send me your productions, therefore, is to impress upon you the advantage of considering all I have said in previous chapters concerning flesh painting, and urge upon you the necessity of a proper amount of *keeping*. For instance, in painting a yellow complexion let yellow more or less enter into the composition of all your flesh colours; in painting a very fair complexion preserve delicacy and pearliness in all your compounded hues and shades; and when engaged upon a ruddy complexion let it be expressed in the warmth and richness of the broken and shadow tints as well as in the purer local colours. I have said much the same thing as this before, but, by repetition in varying phrases, I hope to impress upon your mind more strongly the more important and prominent points of practice to be observed, and the more common and dangerous errors to be avoided. Nothing is uglier and more inartistic than the common error of blue greys in a ruddy or yellow complexion, instead of those tending, however slightly, to purple and green. Many popular miniature painters adopt one tone for all their broken tints, making them green or blue, violet or purple, grey or brown, without the slightest reference to those of nature; following blindly some conventional idea, or triumphantly pointing, perhaps, for their authority to some fine piece of work by a pet old master, in which the varnish has turned yellow and given all the cold greys a decidedly green or greenish tone.

* Cadmium yellow being a very powerful colour, a very small portion will suffice.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Arthur E.—Some skill is required, but not more than can be easily acquired. I am no advocate for the use of body colours in photographic colouring: apart from the reasons I have given their effect is so cold, sickly, mealy, and opaque, that I think their use should be confined to filling in the outlines of such conventional designs as belong to ornamental painting, where such flat, clean, and even tints may be pleasing without offending good taste. I will, however, give you the information you require. Obtain your colours in powder; grind and regrind them repeatedly in distilled water, and mix them with a size made from parchment. Mount upon a thick hot-pressed board, and do not apply your colours too thickly at once. Use large soft brushes; fill in as quickly and with as light a touch as possible; avoid gum, or use it in a very weak solution, and work with neatness, care, and speed.

"Dust Ahoy!"—You are right. I am about having a new painting-desk made, which will enable me to slide one sheet of glass over my palette when not absolutely in use, and another over the whole or part of my picture, so as to shield it entirely from dust during any pause in my work, or shield it partially when from the upper part of my picture I go to the lower, say from the face to the hands. "Go thou and do likewise." I would write to you privately, and enclose a drawing of the desk, were it not that just now I have so many demands upon my time.

A Painter.—See the above reply. Delicate finish can never be secured in a dusty room. Every motion sets the dust afloat, and the slightest deposit of the smallest particles will go far to spoil a miniature picture. The only precautions I can suggest are those already given and the above. Many of my pictures have also been so spoiled.

G. R. S.—The information respecting "Eludoric Painting," which sometime since I was unable to supply this correspondent with, I have discovered in a work, translated from the French of M. Constant de Massoul, which was published in 1797. The painting is executed upon a ground prepared with white lead and poppy oil. Three coats of this priming is laid on, each one being allowed to dry and being scraped smooth before the application of another. You could not, therefore, apply this to photographic colouring. The pigments are *very* finely ground, and are kept in distilled water. They must not be brought into contact with any metallic surface. The palette protects the colours from dust by a covering of glass (a hint you will see I have taken). Distilled water is also kept in contact with the painting while the colours are moist; and the work is also retouched *through* it. When the oil comes to the surface of the water it is poured off, and the picture being covered with a bell glass, is put in a box and gently heated. When quite dry, it is scraped smooth and flat. For each colouring this process is repeated. The colours used must be such as will not be disturbed by the water. The chief value of this process is that its pigments have not more oil than is absolutely essential to their adherence, and that no varnish is used—the picture beingfastened under a glass, which is so contrived as to preserve it from air.

G. L., Guernsey.—Boil the parchment in water, and then strain it from the dregs. Lip glue may be made, I believe, with isinglass dissolved by heat, mixed with the above made strong, to which a small proportion of sugar-candy and gum tragacinth has been added.

F. M.—I cannot claim for the reply you require the space it would demand, or I would willingly oblige. The work was published by David Bogue, of Fleet Street, and was reviewed in all the various journals devoted to art. Its principles were very widely discussed at the time—some upholding, some denouncing them. Leslie, the painter, I believe, denounced them, but not publicly.

Dabbler.—The ivory is bleached in the sun, under a piece of glass, taking care that the heat is not sufficient to make it warp and crack. It is then scraped smooth with a razor, or a "*scraper*," and finished with fine pumice-stone powder. Some use a little distilled vinegar with the first pumice powder, as they say its acidity opens the pores of the ivory, and makes it take colour better. If the ivory be fresh from the turner's, coarse sand-paper may succeed the scraping.

George Smith.—I have heard of a preparation, composed of isinglass and extremely fine pumice-stone powder, being spread over the surface of the photograph, so as to form a tooth which would receive the crayon. Try it, using about a tablespoonful of the powder to about a pint of the size, and boiling the mixture before using. As it forms a kind of thin paste, the print should be a vigorous one.

Foreign Correspondence.

Paris, December 28, 1860.

I HAVE no great abundance of processes and formulæ to commence the opening year with. The monthly meeting of the French Photographic Society, which has just been held, and upon which I had counted a little, offered nought of the kind. An interesting discussion, however, to which I will presently return, occupied the larger part of the evening; while the rest of the time was taken up with the presentation of photographs. Among these was a monography of the Imperial Asylum, at Vincennes, in which convalescent workmen are received. The views, both interior and exterior, are each animated with groups of persons, arranged with that perfect good taste which reminds you that the author, M. Charles Négre, joins to his photographic skill the experience of the painter. The inmates of the establishment served as models for these little pictures.

MM. Bingham and Nadar presented some specimens of electric-light printing. They employ a Bunsen apparatus of 50 elements, with one of Seurin's regulators, and a reflector, at a distance of 2 metres 25 centimetres. The results obtained are already very satisfactory. Communications had been announced relative to positive printing by steam and on the panoramic camera. These communications were not forthcoming; and despite the desire generally eflt to know the means employed by M. Fontayne for printing, photographically, at the rate of 4,000 copies an hour, the members were obliged to be resigned. This dearth of new processes ought not to be regarded as discouraging: far from having exhausted its resources, photography is in a moment of transition, and will, doubtless, soon enter upon unexplored paths. As I have already remarked, the principal efforts being made are directed to the improvement of the modes of printing. But for all experiments the present season is most decidedly unfavourable.

I know not what is the state of the atmosphere in England, but here the long-continued rain and fog have given place to snow. All is white, with the exception of the sky, which is yellow. With such unphotogenic weather, I am at a loss to know how the portraitists manage; for their reception-rooms are encumbered with the persons, who want their portraits for new year's gifts. In that photographers are not favoured: the period of the year at which their lucrative labours increase in an enormous proportion is precisely the period at which the diminution of the light is the greatest. In spite, however, of this drawback, they find means to make splendid profits; and I do not think they have much ground for complaint.

It was Woodward's solar camera which was again the subject of the discussion at the meeting of the Photographic Society; but, thanks to M. Léon Foucauld's triumphant resolution of the question, I do not think it will soon need again to demand so much of the Society's time. M. Foucauld proved with mathematical clearness that all the objections turned upon a misunderstanding, and that M. Claudet alone was in the right. His demonstration was not lengthy, but it was presented with an authority and a precision that were unanswerable: M. Bertsch himself was forced to acknowledge it. The figure traced upon the black-board, by the learned photographer of the Paris Observatory, sufficed to show both the excellence of the principle of Woodward's camera and the correctness of M. Claudet's reasoning. The image formed at the centre of the objective—that is to say at the apex of the cone—is certainly that of the sun, upon which the image of the interposed *cliché* becomes depicted, for the *cliché*, being transparent, does not interrupt the convergent direction of the rays. The two images exist really but at the apex of the cone—that is to say, at the centre of the objective; all the other parts of which, receiving extremely feeble rays, form but the diaphragm. There is then a maximum light, and freedom from the aberrations of sphericity. This conclusion is identical with M. Claudet's.

A curious and unprecedented incident has occurred in the course of Quinet's lawsuit. After the advocates had pleaded, the tribunal, not considering itself sufficiently enlightened on the subject, requested that experiments should be made in its presence: only the magistrates, unfamiliar with photography, did not reflect that a court of justice is scarcely a suitable operating-room; so the test proved nothing, and no decision was come to. It were to be wished that lawsuits of such a nature should be submitted to special courts composed of practical men. It is almost impossible for a magistrate to arrive at an exact opinion on complicated questions of which he knows not the first elements, and upon which, however, the interests and fortune of large numbers depend.

The French Photographic Society is actively preparing for its exhibition, which is to be held simultaneously with the Fine Arts Exhibition, in the Palace of Industry. The Society intends appealing to all photographers, and it is very desirable that the appeal should be responded to by the English artists. Comparison will be profitable to all. Besides, the larger the number of works of mark exhibited to the public, the greater will be the development of taste for an art whose importance is already understood, but all the resources of which are but partially known. Your *instantaneous* pictures and composed scenes would be very successful—and legitimately so: the beauty of the results would excite the emulation of our operators, and induce them to turn their talents in these two directions, which they have too much neglected.

I spoke lately of the fine collection of *clichés* brought from Mount Athos by Count Sevastianoff. M. Lemercier has reproduced from lithographic stones the *facsimiles* of some manuscripts figuring therein. They were executed with Poitevin's process; and the result is very satisfactory, as I have ascertained from personal inspection. The fact is noteworthy, as bearing upon the future of photography. ERNEST LACAN.

New Books.

Literary and Scientific Register and Almanack for 1861, *by* J. W. G. GUTCH, M.R.C.S.L., &c., late Foreign Service Queen's Messenger.

London: KENT & Co., Paternoster-row.

THIS publication, which has now made its twentieth appearance, increases in usefulness year by year: it contains, in a condensed form, a mass of information upon various branches of science, including astronomy, chemistry, geology, geography, optics, photography, and a host of other things too numerous to mention.

The architectural, geographical, and geological tables have been materially improved in the last issue. Being in the pocket-book form, it is extremely handy for frequent reference, and will be found invaluable to many persons whose memory for dates, quantities, formulæ, &c. is at fault. Mr. Gutch is a practical photographer of no mean skill, and therefore likely to aid those who require a guide in pursuing this art. We perceive with satisfaction that the various photographic formulæ are selected from authorities of high repute; and we have no doubt that to many of our readers this publication will prove of value. We cordially hope it may meet with an extensive circulation.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE ADDRESS AT THE CHORLTON SOCIETY.

To the EDITOR.

SIR,—On perusing the last number of your Journal I discovered that a third, and an anonymous, writer had entered upon the discussion of the photo-chemical question. I experienced no surprise on realising the fact; but I admit my astonishment that he has written so much and yet said so little, and that the article is devoid of evidence and deficient in courtesy. I therefore solicit a corner in the Journal, in support of the assailed.

The first, second, and third paragraphs require no comments. In the fourth, these words occur:—"But we think, with Mr. Hardwich, that such disencouraging arguments as he offers should be condemned."

To which I reply: On the same principle so should the arguments of any man who, by legitimate reasoning, endeavours to stimulate his fellows to the acquisition of that which he knows they would be all the better for possessing; for we must know what our deficiencies *are*, before we can apply ourselves to their rectification.

Mr. Griffiths has (and not so unwisely as some persons seem to think, but have failed to prove) directed the attention of photographers to the unsatisfactory state of photo-chemistry—which opinion a careful consideration of facts justifies him in holding.

Does not the fact of photographers being, even now, engaged in the investigation of its mysteries, proclaim its unsatisfactory condition, and that notwithstanding the comparative perfection of the results obtained? Are we *content* with our present knowledge? If not, how can "Sigma" maintain that we are otherwise than dissatisfied?

Mr. Griffiths stated his views to his fellow-members with the intention, *not of discouraging* them, but of enlisting more workers in the pursuit of a particular branch of science, and to stimulate them to the study of theoretical, in addition to mechanical photography. "He professes to deplore our present ignorance, but does nothing to dispel the darkness which he seems to feel himself." Not so! Mr. Grif-

fiths is no simulator, and does not *profess*. He is sincere in what he advocates. How does "Sigma" know that Mr. Griffiths is doing nothing, or *does* nothing, &c.? If "Sigma" were as observant as a man who makes such assertions ought to be he would have seen, from a subsequent statement by Mr. Griffiths, that he *was* doing something. Will "Sigma" be good enough to substantiate his assertion? and also, when next he professes to quote the words of another, to honestly quote the entire sentence, and not as much of it *only* as suits his purpose?

"Sigma" says — "Perhaps he (Mr. Griffiths) means its effects are becoming increasingly known, which is just what every lover of the art has most at heart." Let me advise "Sigma" to *read carefully* before he attempts to tutor: there is no "perhaps" in the matter, as your readers will find if they will turn to the report of Mr. Griffiths's paper in your Journal of October 1st.

Paragraph the sixth is a far-fetched one, wherein a sentence, between inverted commas, is very kindly constructed. It seems to me that "Sigma" has here arrived at a hasty conclusion, and that the argument of Mr. Griffiths, instead of being what it is represented as being, amounts to this:—that although we know more now than we did ten years since, we are yet in want of very desirable information, and the greater the number of persons we can induce to seek diligently for it the sooner will it be in our possession. Why, the direct tendency of Mr. Griffiths's paper is to lead the photographer to the study of the chemical and other principles of his art; to persuade him to teach his head what his hands are doing. Can "Sigma" make it manifest that an ignorant artisan is a superior workman to an educated one? "But we do not want to re-write Mr. Griffiths's paper, or one paragraph after another might be treated thus"—that is, construed to the disadvantage of Mr. Griffiths. I challenge "Sigma" to do it if he can; and if he does it by means of fair, sound argument I will acknowledge its accomplishment.

I can coincide with some of "Sigma's" observations, as indeed every one can—for instance, those in the early portion of the last paragraph of his paper; but the statement that arguments such as those of Mr. Griffiths would in the beginning have exercised an adverse influence I emphatically deny. He ("Sigma") should not merely tell us they would have done so, when it is much *better*, but not so *easy*, to show us how.

Thus far I have followed the substance of "Sigma's" communication. Now let us see if anything encouraging can be gleaned from that of Mr. Griffiths. I should like to copy some of the paragraphs entire, but fear you would not be able to spare the necessary space; I must therefore request your readers to reperuse the first, second, and third paragraphs of Mr. Griffiths's paper, at page 290 in your Journal of October 1st.

If these do not acknowledge that something to be proud of has been accomplished I should like to know what they *do* mean?

In paragraph 10—"*A wide field for research is open* to the enterprising experimentalist in this department, who should *not rest satisfied* until the improvement in his lenses is such as that the angle of view embraced by them shall more nearly approach that of the eye;" and also—"*Both these* objects I am persuaded *can* and *will be ultimately attained.*"

In paragraph 17—"But the chemical department, though far outweighing the other *in the importance of the results* that may be expected to arise from a more *general and energetic study of it*," &c.

In paragraph 20—"But I trust I have done sufficient to *excite* in you a *determination to commence* a course of careful experiments," &c. I can see no throwing of cold water in this, but quite the contrary, even though the object in view might be hopeless of attainment.

Again, is not the whole of that portion of the essay referring to Mr. Hooper's experiments an incentive to additional exertion? I think it is.

In conclusion, sir, I cannot rid myself of the impression that the opposition encountered by Mr. Griffiths is dictated by some other feeling than that of the true interest of photography.

Multiplicity of *opinion, without evidence*, ought to have no influence (and has none) in the minds of impartial men. If the views of Mr. Griffiths are so prejudicial to the advancement of photography as by "Sigma" they are said to be, let him establish the position he takes by evidence. I for one am not content to accept the naked "not-proven" assertion of any man, and more especially so when that assertion is calculated to injure another individual in the estimation of the public.

As an instance of the carefulness of "Sigma," he attributes that to Mr. Wardley which was said by Mr. Rogerson. Now, as the latter-named gentleman is about double the weight of Mr. Wardley, you will admit the justice (to Mr. Wardley, at least) of placing the responsibility of the words on the right man—aye, and in the right place.

I am, yours, &c., CHARLES ADIN.

Manchester, 24th Dec. 1860.

[We can by no means assent to the assumption that photographic chemistry is in an unsatisfactory state: on the contrary, we regard it as in a highly healthy condition. What wise man is ever content with the amount of his knowledge? We may safely conclude that were he ever so diligent, and his life extended to ten times its ordinary span, he would yet be only on the threshold of the vast expanse of knowledge still to be acquired.

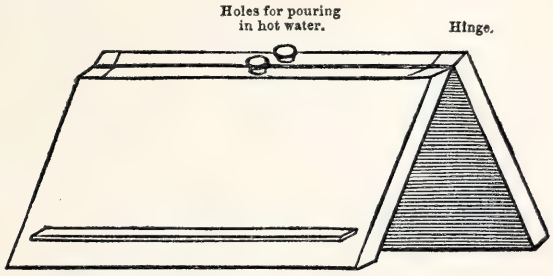
We are, however, of opinion that Mr. Griffiths's observations have been to some extent misunderstood from a slight obscurity of diction in which they were couched. If it be possible to interpret words in two senses, we may be assured that some persons will be certain to adopt the wrong one—not intentionally, but inadvertently. This we know to our cost; for, though we are generally very careful in what we write, we have *occasionally* found that our remarks have been taken in a very different spirit to that in which they were written. It has been jocosely said, in reply to the question—"Can a double meaning be just?"—if a man means well, the more he means the better. Let us give Mr. Griffiths credit for such a double meaning.—Ed.]

PHOTOGRAPHIC PLATE-WARMING AND DRYING MACHINE.

To the Editor.

Sir,—I know not if the following description of what has proved to me, during my frequent photographic journeyings in the summer, an exceedingly useful appliance, will be deemed of sufficient importance for insertion in your pages. Possibly the idea is not a new one. All I can say is, I had never met with anything of the like kind before I had mine made, and have never regretted the day I commenced its use. I used oftentimes to find it a troublesome matter to warm my plates easily, rapidly, and without fear of cracking when applying the Sœhnée varnish, which I always use. There being no fire generally in the room during the summer months, and the kitchen fire in strange houses not being always convenient, or *come-at-able*, I consequently had made, by an ordinary tinman, two flat boxes, hinged at the top, one inch thick or deep, ten inches long and eight broad, with a round hole at the top to pour hot water in, and a brass stopper screw to keep it in: a ledge at the bottom of each, running the whole length, completes the little plate-warming machine; and when open and in use, it is in appearance exactly like a double reading-desk.

The following simple diagram will, I hope, easily explain my meaning; for it is often difficult to convey clearly an idea of those contrivances by mere words:—



I lay two plates to be varnished on each flat side of the hot water box, and by the time I have varnished one the other is ready, and whilst varnishing that the first is dried and finished. They are thus done with great rapidity and ease, and no fear of breakage, or having the glass plate unequally heated; and the two boxes folding together, take up very little room. Mine was made for the plates I usually employ, six and a-half by ten and a-half, a size I have found convenient in every respect.

Let me take this opportunity for thanking you for the Almanack accompanying your last most interesting number. It is a very useful and ingeniously-compiled little work, and deserves to be *the* Almanack of photographers.—I am, yours, &c., J. W. G. GUTCH.

[We fancy this is a very excellent arrangement, as by leaving out the stoppers, and not filling the receptacles quite full of water, a spirit lamp, or other small flame, placed beneath, would keep up the temperature for some considerable time.—Ed.]

A WORD IN FAVOUR OF METAGELATINE.

To the Editor.

Sir,—I have taken the liberty of forwarding you a few slides, trusting you may find them worthy of forming a part of your collection—not as possessing any particular merit, further than that of giving some of our city antiquities; but, perhaps, as specimens of some of the different dry processes, they may have an interest at the present time.

My experience does not date far back; but, having pursued the study *con amore*, difficulties are soon overcome. I have tried most of the many dry processes which have from time to time appeared in the pages of your excellent Journal, and believe that good results may be obtained from nearly all of them; but, so far as my experience goes, I must give the preference to the *metagelatine*. This, I am aware, is not a favourite; but I cannot help feeling certain that it would soon become so if fairly *tried*. The plates are easily prepared; will keep as long as any *prepared* plates, and give uniformly good results. During the past summer I have had ample experience of their keeping qualities, in consequence of the great rarity of fine days. I may instance the Kenilworth Views sent. I had one dozen plates prepared, which were kept more than six weeks waiting for a favourable opportunity to be used: at length I exposed the twelve, and developed a dozen negatives. I think I have sent you ten prints: the other two are quite as good as the rest, but I have not printed from them as yet. The metagelatine I find better than any other process for interiors, as they will bear protracted exposure and development without stains, or breaking the film. Nos. 101 and 102, *The Altar Screen, St. Michael's*, were exposed over two hours, the light being indifferent, and occupied more than eighteen hours in developing. I use gallic acid and nitrate solution, intensifying with pyrogallic acid. Both of the interiors (*Trinity* and *St. Michael's*) have a bad light, yellow predomi-

nating. With the collodion-albumen I could scarcely get an impression. I have tried the various collodions advertised as specially adapted for certain processes, &c., but I now use *one* kind only for *every process*, which I find all that can be desired. No. 9 is a specimen of its rapidity, used wet. No. 77 is simply the collodion plate, slightly washed in distilled water on its removal from the nitrate bath, then washed with a weak solution of salt and water, with a final slight wash of distilled water, dried, and kept three days: exposure, three seconds, and developed with iron. The sky has been stopped out, which does not improve the picture.

I intended giving the different exposures, as I have memoranda (in making experiments for the purpose of comparison this was necessary); but, unless you wish it, I will not take up your valuable space.

With regard to quickness, I have found Fothergill most rapid, metagelatine requiring a shorter exposure than the collodio-albumen; but having so little bright light this summer, the results have not been so good as I could have wished. I have generally used a pair of Grubb's aplanatic lenses, and like them. I also find large plates prepared by the metagelatine process far superior to the Fothergill or collodio-albumen. I send you a print of one of our city gates, in fact the only one now in existence.—I am, yours, &c., J. WINGRAVE.

Coventry, Dec. 6, 1860.

[Mr. Hill, the Treasurer of the North London Photographic Association, is a warm advocate of your favourite process, and is very successful therewith. Thanks for your specimens.—Ed.]

CENTERING LENSES.

To the Editor.

Sir,—I was going to write to you to mention a method of *ascertaining* the correctness of the centering of the lenses in a portrait combination, but I see by the last Journal that you know it. It was published many years ago—I think by Dr. Wollaston—as applied to the triple object-glass of a telescope. The same author published instructions for *centering* lenses, which differ from those stated by you in not requiring a hollow mandril, although the principle is the same. The directions were these:—Turn a chuck a *trifle smaller* then the lens; hollow the face of it so that the lens shall rest only against a cylindrical edge, and put into the cavity of the chuck a sufficient quantity of pitch-cement to hold the lens. Warm the latter, and press it against the chuck until it bears on the edge all round. (This is not always done in practice.) The back surface is sure then to be concentric with the mandril; and the front must be made so by shifting, until the *reflection* of any bright object ceases to "wobble" when the mandril revolves. The cement is then allowed to cool, and the edge of the lens either turned or ground true. The optical and mechanical centres then coincide, and it only remains to turn the cell true in its place.

I centered lenses by this method more than twenty years ago, and found an error in the triple object-glass of a small telescope by Troughton.

I am, yours, &c., GEORGE JACKSON.

Spitalfields, Dec. 21, 1860.

THE "FOTHERGILL" PROCESS.

To the Editor.

Sir,—In reply to the request of your correspondent, "Inquirer," that I would through the medium of your Journal give my manner of working the Fothergill process, I beg to forward the following details for insertion, should you deem them worthy of a place in your valuable Journal.—I am, yours, &c., S. H. G.

Dec. 21, 1860.

Having ground the edges of the glasses and perfectly cleaned them, arrange them singly round the sides of an open box lined with clean paper, and inside of which heated flat irons have been placed. When the glasses are cooled, place one of them on a pneumatic plateholder, and polish it with a silk handkerchief. Pour on the collodion, which must be one that will adhere firmly to the glass—a thin collodion is preferable; allow the film to set well and immerse the plate in a 35-grain silver bath, slightly acid, moving it up and down until all greasiness has disappeared, and a perfectly even coating is obtained. When the plate is removed from the bath, wipe from the back all remains of the silver solution, and set it on angle to drain for about a minute; then pour from a jug evenly and thoroughly over the plate, particularly round the edges, two quarts of common water; drain for about three-fourths of a minute; then pour on the albumen three times in an even wave, reversing the flow each time, and always using a fresh portion of albumen; immediately pour over the plate, as after sensitising, two quarts of water; dry spontaneously for five or ten minutes, and then place on angle against the side of a box heated with flat irons until perfectly dry; when store in a tight tin box.

The exposure of the prepared plate will depend on the lens: six minutes is about the average. As the plates are uniformly prepared great certainty may be obtained. Plates so prepared will keep six weeks with undiminished sensitiveness.

To develop, moisten the plate with a little water and pour on the developing solution, keeping it moving for about two minutes. Then throw it away and apply a fresh portion of the developer; keep pouring it off and on, using fresh solution as soon as it becomes discoloured; and when all the details are fully out, and a considerable amount of intensity obtained, wash and fix in hyposulphite of soda. After copious washing, the picture may be intensified to any amount, withoutfear of ouding the shadows, by proceeding with the development as before; or it may be dried and re-developed at some convenient opportunity. The plate must dry spontaneously, and when surface-dry touched round the edges with gum mucilage, otherwise the film will curl up when dry. The development may occupy from half-an-hour to an hour and a-half.

ALBUMEN SOLUTION.

Albumen	1 ounce.
Water	1 ounce.
Liquor ammoniæ	8 drops.

DEVELOPING SOLUTION.

Pyrogallic acid	16 grains.
Spirits of wine	3½ drachms.
Water	4½ drachms.
Citric acid	8 grains.

One part to seven of water.

Immediately before using add eight drops of silver solution to the ounce of the diluted, mixing well with a glass rod.

MESSRS. PETSCHLER AND MANN'S PROCESS.

To the Editor.

Sir,—I have latterly been working with the process of Messrs. Petschler and Mann, and I have got some first-rate results with it; but I was rather short of bath solution, and I put about three ounces of distilled water into the bath, without any silver in it, and I was surprised to find, when I made some plates ready and exposed them, that I had very faint pictures. The other solution was about thirty-five grains to the ounce, and there were about sixteen ounces in the bath. Would reducing the strength of the silver solution be the cause of my failing? If you think so, please say what strength you would recommend for me to use.—I am, yours, &c., JOSHUA HORNE.

[The original strength was very good; but thirty grains to the ounce will do. We are not at all certain that the fault was in the strength of the bath—perhaps it was in developing.—Ed.]

ANSWERS TO CORRESPONDENTS.

☞ *The Titlepage and Index for Volume VII. (for* 1860*) will be given with next number.*

R. E. P.—Your communication is far too personal for our columns. Attack principles as much as you please, but not individuals; or at any rate, avoid imputing disreputable motives to their actions.

E. Eastwood.—The address of the "Moulded Carbon Filter Company" is 62, Fleet Street, London, E.C. You will find a Grove's battery cheaper in the long run, and far more convenient, than a Bunsen's.

Solus.—1. Fothergill's, as given at pages 34 and 35 of the Almanack.—1a. Because gelatine and gum do not assist in holding the collodion film on to the plate, while albumen does so; and again, albumenised plates can be made to keep good longer as a rule. —2. Favourable generally.—3. Yes; Flood it with alcohol or benzole, and re-varnish.

More Light.—1. By filtration.—2. Afterwards.—3. Need not be evaporated at all; but if you know the quantity of gold originally employed, add distilled water, so as to make a round number of minims contain one grain of gold.—4. Yes; but it requires recrystallisation twice, or perhaps thrice, if you wish to obtain it pure in a solid form.

J. H. Slater.—A good orthographic lens will probably answer your purpose; and though it will be (thus applied) probably somewhat quicker in action than the single combination lens, it will not be quick. A well-constructed double lens, with a 3-inch front and 5-inch back combination, of about 20-inch equivalent focus, would answer better, but would be far more costly.

J. C. Burrell.—You will find the principles discussed at length in our volume for 1859: viz., Vol. VI., pages 223, 224, and 253-5. M. Bertsch's views are very much the same as our own; the other gentleman you name is no authority on optical matters, and in the instance alluded to has committed an absurd blunder. A heliostat is simply a mirror moved by clockwork, so as to reflect the sun's light always in one direction. The single achromatised lens would not be large enough for a condenser.

A. R. P.—1. No; unless the bath becomes dusty.—2. Yes; but you will then have acetate of potash in the bath.—3. See *British Journal Almanack*, page 29.—4. Blue, certainly; you may almost as well use black as green.—5. It is impossible to reply correctly to so vague a question. You do not say what *kinds* or *sizes* are to be compared, and what you term "ordinary" ones have very different qualities one with another.—6. Do not mix any silver with the cyanide fixing solution; that only weakens and contaminates it.—7. Immaterial; you cannot do better than follow the instructions in Hardwich's *Manual*.

Oxoniensis.—It is a frightful case of photographic "measles," in all probability arising from your having removed the print from the toniug bath direct into the hyposulphite solution, without washing first; or, if washed, it was possibly *not drained* or dried enough, and left in repose in the fixing bath after immersion—a proceeding which has the same effect as that of using *too weak* a solution of hyposulphite of soda. Peruse carefully Mr. Dawson's papers, read at the North London Photographic Association, and published in our last volume, pages 127 and 174. They are most valuable ontributions to a photographer's stock of knowledge.

Edina.—Your suggestion is faulty as regards the diaphragm, which, if properly placed between the lenses of a portrait combination, should be closer to the front than the back pair, as indeed you have made it in your well-executed sketch. But if you remove the back lenses, and reverse the whole affair, so as to use the front one alone for views, in that case the diaphragm will be *too near* to the lens. If, on the contrary, the screws of the back and front combinations are alike, a removal of the back one and substitution of the front one for it will put matters very nearly right as regards the position of the diaphragm—an arrangement which is even more simple than what you propose.

*** Among numerous other articles left over for want of space is *Palestine in* 1860. No. II. By John Cramb. It will appear in next number.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 134, Vol. VIII.—JANUARY 15, 1861.

Toning Processes.—At the first monthly meeting of the Blackheath Photographic Society, held on the 10th of November last, some remarks were made by the President, Mr. Heisch, relative to the Alkaline Gold Toning Process, which are likely to mislead those who are but imperfectly acquainted with the various experiments that have been conducted for the purpose of ascertaining what principle of operation in toning appears to offer the best security to ensure permanence of the positive proofs. It is not only that Mr. Heisch attributes to the process defects which are due rather to faulty manipulation, but that a gentleman of his reputation should attempt to throw again a doubt upon points which have been satisfactorily settled, that we find cause for regret. For example, he remarked, "the stability of the (prints toned by the) alkaline process required most jealous watching, and that he at present did not see any reason for considering it more stable than the other" — alluding here to the gold and hyposulphite of soda bath. We beg to offer for his consideration a few suggestions that may possibly tend to modify his opinion. We presume that it will not be denied that the bath made by mixing chloride of gold with hyposulphite of soda in excess consists of a mixture of *sel d'or* (double hyposulphite of gold and soda) with hyposulphite of soda. Now, the toning by means of *sel d'or* we believe to be effected thus:—the compound salt is decomposed, the sulphur attacking the reduced silver forming the image causes a deposit of gold thereon, without, however, removing the sulphide of silver formed. That this is a probable explanation is corroborated to some extent by the fact that, if the print be fixed first in hyposulphite of soda, the *sel d'or* will not tone it afterwards; but if ammonia be substituted as the fixing agent, by which no sulphurisation of the proof can take place, then the toning by *sel d'or* can be proceeded with successfully. The same observations apply to the alkaline gold toning bath. There is, however, a distinction to be drawn between them in one remarkable particular, and that is, that if a print be cut in two pieces, and each partially toned, the one with *sel d'or* and the other with the alkaline gold bath, both then washed and fixed with hyposulphite of soda, it will be found that, on attempting to continue the toning of the two pieces, each in its respective bath, that in the *sel d'or* will not progress, while that in the alkaline gold bath can be carried a stage further in toning. This we believe to be owing to the more complete reduction of the gold in one case than in the other.

It has been asserted that pure sulphide of silver is a very stable compound. This we do not doubt, but we have as little doubt that, when *in combination with organic matter*, it is not so; and this is its precise condition in the photograph. It has been proved, beyond dispute, by Mr. Hardwich, Mr. Dawson, and MM. Davanne and Girard, that the two causes of fading are sulphurisation or oxidation, or both combined. Mr. Heisch will scarcely dispute that in most chemical experiments time is an important element; but a large portion of the time required to bring about any result in the ordinary way may be economised by the adoption of certain precautions. For instance, by enclosing portions of paper photographs in hermetically-sealed vessels, containing moisture, oxygen gas, chromic acid, &c., the effects produced in a few months will probably correspond to the ordinary destructive influences continued for several years; consequently we are justified in concluding that, of proofs toned by the various methods employed, those which offer most resistance to the destructive effects of oxidising and sulphurising agents so applied are more likely to resist similar influences under ordinary circumstances; and prints carefully toned in the alkaline gold bath are found to bear these various modes of ill-treatment with the least amount of detriment.

Mr. Heisch says, in reference to the alkaline gold bath:—"In that process the print was put into a mixture of chloride of gold and carbonate of soda. When toned it was taken out, and put into a solution of hyposulphite of soda." This is not the general course pursued, but the proof well washed before immersion in the hyposulphite of soda, consequently the reasoning based upon this assumption falls to the ground, But, even were the case as stated by Mr. Heisch, we cannot admit that the same decomposition in the pores of the paper in the latter case, as in the bath in the former, would necessarily exert a similar destructive influence, because of the different condition of the image on the paper, which, after immersion in the alkaline gold bath, is protected by, if not converted into, metallic gold. We refer those who wish to reconsider the question to Mr. Heisch's remarks at page 355 of our preceding volume.

Lenses Free from Distortion.—In a communication from Mr. Rothwell, published in the last number of the *Journal of the Photographic Society*, that gentleman claims to have been the inventor or discoverer of the principle for constructing photographic lenses producing an image free from distortion, upon the ground that he pointed out, in the year 1858, the fact that, by placing the diaphragm between the back and front combinations of a portrait lens, at such distance from each as is in a proportionate ratio to their respective focal distances for parallel rays, the amount of displacement of the lateral pencils is equally balanced, and that they emerge in a direction parallel to that of their incidence upon the front combination. It is alleged also, in the same letter, that the late Mr. Frederick Scott Archer having previously used diaphragms between the components of his lenses does not interfere with Mr. Rothwell's claim, because the latter assumes that Mr. Archer was not aware of the importance of attention to the exact position as above indicated, and did not construct his lenses with reference thereto. This is, however, a mere assumption on the part of Mr. Rothwell; and we are in a position to give direct testimony to the contrary. In the year 1853 we had frequent conversations with Mr. Archer, when we were in the habit of discussing the principles upon which double combination lenses for photographic purposes should be constructed, and frequent allusions were made by both to the very point claimed as a new discovery by Mr. Rothwell. In corroboration of this statement we have a lens made by the late Mr. Archer, at pre-

sent in the possession of a friend, but belonging to us, in which the diaphragm is located as previously described, and *which was designedly so placed*. Moreover, we had in 1852 one of the same maker's fluid lenses, in which the same principle of construction was adopted with reference to the diaphragm.

We are not aware that even at the time specified any discovery of a novel principle had been made; nor do we perceive how this could have been so regarded by any one who had considered the question of lateral displacement of the oblique pencil, by the use of a diaphragm at a distance in front of, or behind, a lens. But the *application* of this principle to photographic lenses was regarded by Mr. Archer as a novelty, and justly so; and on this point we have some partial corroborative evidence to submit, in the fact that our good friend, Dr. Diamond, the accomplished Secretary of the Photographic Society, mentioned to us before we made Mr. Archer's acquaintance, that the latter "laughed at the idea of placing a diaphragm in contact with the front combination of a portrait lens." Again, as regards the principle involved, we may cite the position of the stop with reference to the erecting glasses of a terrestrial telescope, as bearing upon the case.

Until we heard Mr. Dallmeyer read his paper at the meeting of the Photographic Society, in which Mr. Rothwell's name was mentioned with reference to some principle (not defined) alleged to have been discovered by him, we had never to our knowledge heard his name; and yet we were in the year 1853 familiar with the principle which he claims to have discovered in 1858, as we have already shown; and further, that Mr. Archer was familiar with it, and *had applied it to photographic lenses*, at a still earlier date.

We now come to the question of date of publication. As far as we can perceive it is only recently at least that Mr. Rothwell can be supposed to have made known his presumed discovery; whereas Mr. Archer constructed and sold his lenses in 1852, and in 1853 distinctly pointed out why he placed his diaphragms in what was then regarded as an unusual position. It has been attempted, by the editor of a contemporary, to throw discredit upon Mr. Ar cer, upon the alleged ground that his was but an empirical use either of the diaphragm or concave lens between the normal components of an ordinary portrait combination. This we have hitherto had no fitting opportunity of noticing; but we assert emphatically that there was nothing whatever empirical about Mr. Archer's proceeding, and that what he did was done designedly, and after due consideration of the matter, in order to accomplish the end proposed.

Our special object in thus entering into these particulars is to justify statements that we have made upon several former occasions, the accuracy of which have been sought to be called in question. We have no personal knowledge of Mr. Rothwell, and no imputation to throw upon him. We are ready to give him full credit for having wrought out the point claimed by him as novel for himself, without presuming that he has been guilty of plagiarism. But we must unequivocally assert that, in imagining himself to have been the *original* promulgator of the principle claimed by him, he was altogether mistaken.

THE SOLAR CAMERA.—Our readers will have become too familiar with the practice which we have always followed, of giving all sides a fair hearing — antagonists as well as allies—to feel any surprise at our calling in question a statement made in the last letter which we published from our esteemed Paris correspondent, M. Ernest Lacan; for while we accord to all who come before the public, through our columns, perfect liberty to express their sentiments upon any subject connected with photography, we, at the same time, retain an equal freedom, and are, moreover, not disposed to acquiesce in the *ipse dixit* of any one, no matter how exalted the authority whence it springs, provided that the sentence be not in accordance with known principles. The statement to which we allude is one referring to the Solar Camera, and is the fourth paragraph in M. Lacan's letter, at page 22 of the current volume, of which we quote a small portion, viz:—"M. Foucauld proved, with mathematical clearness, that all the objections turned upon a misunderstanding, and that M. Claudet alone was in the right. His demonstration was not lengthy, but it was presented *with an authority* and a precision that were unanswerable: M. Bertsch himself was forced to acknowledge it." Without knowing to what the word "*misunderstanding*" applied, it would be idle to question what M. Foucauld really did demonstrate; but we absolutely deny the accuracy of the conclusion as enunciated by M. Lacan, and much regret that he did not repeat the demonstration which he considers so clear and unanswerable. We trust that he will yet do so.

M. LACAN.—We notice with regret that our esteemed correspondent in Paris, M. Ernest Lacan, has just relinquished the post of editor of *La Lumière*, which he has occupied with distinguished success and increasing reputation for the long space of ten years. *La Lumière* was, we believe, the first journal published devoted almost exclusively to photographic science; and some of the earliest records of the London Photographic Society's doings were chronicled therein. We understand that the cause of M. Lacan's secession consists in a difference between his views and those of the proprietor of the publication. We are glad to state, however, that M. Lacan does not contemplate abandoning the literature of photography, which he regards as increasing in importance daily.

EXPLANATION.—We are sorry to find that some remarks made by an esteemed contributor, under a *nom de plume*, have given rise to a considerable amount of irritation, upon the presumed personality of the attack. We are assured by the writer that no inimical motive prompted the observations, which were directed against the sentiments expressed, and which he regarded, and still regards, as detrimental to progress, To avoid any further misunderstanding, however, he withdraws from the contest.

LUNAR PHOTOGRAPHY.

BY SAMUEL FRY.

[Read at a Meeting of the London Photographic Society, Tuesday, January 8, 1861.]

PHOTOGRAPHY, as generally understood, seems so inseparably connected with the light of day, that it appears at first glance anomalous to speak of taking pictures at night without artificial light. But one moment's consideration points to the true state of the case: though to us it be "dark as Erebus," to the lunarians, if such there be, inhabiting that portion of the moon's surface which is turned towards us, it may be broad sunshine, sunrise, or sunset, according to the moon's age and position. If, therefore, we choose a time for our operations in which we are favoured by the same atmospheric conditions required for producing good terrestrial pictures, we have many probabilities in our favour of obtaining good photographs of the moon. It has been matter of surprise with many that lunar negatives display a much larger variety of tone and gradation of shading than the eye can detect on the surface with the telescope; but photographers will easily understand that this is of necessity the case, as whilst large tracts of the moon's surface north-west of Tycho and also south of that centre are of a silvery whiteness, other parts to the east and south-east of the lunar surface present varying hues of yellow and green, each shade having its actinic value, and being accurately impressed on the photographic medium. And this variation in colour is a very happy circumstance for us, as, if the pure silvery tone of the upper portion extended over the entire disc, how flat and chalky would the pictures be!

The darker portions of the moon's surface are generally known as seas; but the appellation appears to be a gratuitous one, as beyond the supposition which some have entertained that the colours before alluded to were caused by sands and other deposits, constituting dry oceanic beds, there appears no other cause for thus denominating what are evidently now dry arid tracts.

My attention was first called to the photography of the moon at the commencement of 1857, by having placed at my disposal the very fine equatorial telescope of Charles Howell, Esq., at Brighton, which had then just been erected in a suitable observatory on the

beach, about a mile from the town. I determined to commence operations at once, and with that object fitted up a little laboratory in another room of the observatory, adjoining the instrument-room. I found a difficulty at starting, arising from the circumstance of the extreme col . of the place greatly reducing the photographic power of the chemicals; and it was thenceforth needful to keep the bath and developer in a dwelling-house for warmth. I then commenced experimenting for the purpose of discovering the exact actinic focus of the telescope; for as the object glass of 8½ inches diameter and 11 feet focus was not corrected for the chemical rays, it was necessary at starting to discover the point of sharpest possible focus. I had made a mahogany board, 12 inches long and 4 wide, with a screw extending the entire length, and so arranged that, by turning a thumb-screw at one end, an upright plate-holder at right angles with the board could be moved in either direction. I also made a graduated scale of degrees along the board, divided into $\frac{1}{10}$ of an inch. The eye-piece of the instrument being removed, this simple camera was, by means of an adjusting collar, fastened to the end of the telescope by the thumb-screw at the end. I obtained a remarkably sharp image at the visual focus, about 3½ inches from the aperture of the telescope, and I began by taking a picture at this point, which, of course, from the non-correction was quite out of focus, but was preserved for comparison. I then began by removing the prepared plate one-tenth of an inch back from the visual focus, and soon found my pictures showed evidence that I was approaching the true focus. I ultimately found that the average sharpest focus was 0·75 inches beyond the visual; but I found constantly a slight, as it were, oscillation of focus within and beyond this point, caused primarily, no doubt, by the varying distance of the moon from the earth, and also to a certain extent by the condition of our atmosphere. M. Claudet was one evening with me at the observatory, and stated, on being informed of this circumstance, that he considered it a striking corroboration of a theory he had advanced at an earlier stage of photography. I always found it necessary on commencing operations to make one or more trial pictures, to discover the very sharpest possible focus; and on more than one occasion, when the moon was in a plane peculiarly suited for delineation, great loss of time arose from overclouding and other unfavourable conditions of atmosphere. For this reason a reflecting telescope is greatly to be preferred to a refractor, as by a reflector the focus may be obtained as in an ordinary camera from the coincidence of the foci.

I now come to the mechanical arrangement necessary for driving the telescope to follow the moon's apparent path; for as, even under the most advantageous circumstances, an exposure of a few seconds is necessary to secure a good negative, it is indispensable to annul the rapid lunar motion by most accurate smooth-running machinery. This was done by a powerful clockwork, regulated, as Mr. De la Rue describes his also to be, by a conical double-beat pendulum, acting on the same principle as the governor of a steam engine. This was easily set to go at any given speed by a dial, and degrees marked thereon; and a few experiments enabled me to set it at any given time to exactly follow the moon; though at first it was rather difficult to discover whether want of sharpness arose from incorrectness of focal position, or want of adjustment of the clock-movement, the mistiness being much the same from each; but the latter fault gives also a rather oblong appearance to the image. With regard to the chemical part of my arrangements, I find it of primary importance to employ the very best chemicals, and the highest possible state of cleanliness, perfect freedom from floating particles in the bath, collodion, or developer, and all three so suited to one another as to work uniformly together. I prefer positive collodion, as being more limpid, and thus pouring better, also from its usually containing both an iodide and bromide in its composition: it does not deteriorate in sensitiveness to any extent, which enables one to keep it in a body, in tall bottles, and allow every particle to settle down to the bottom, and thus draw from the upper portion a quantity absolutely free from all inclination to produce spots or comets. The bath I prefer of forty grains to the ounce, made of pure crystals; and if at all acid I reduce it by saturation with the oxide of silver, and add, testing carefully meanwhile, drop by drop, a weak solution of nitric acid.

I believe this is the way to obtain a bath capable of producing the very highest results for any branch of photography. The developers I use are sometimes pyrogallic, three grains to the oz., and at other times iron of ten grains, and one grain of acetate of soda. Under very favourable circumstances I use the former, as giving at one operation a vigorous, well-defined negative; but where I have to contend with yellowness of the atmosphere and its concomitant photogenic drawbacks, I use the iron solution and intensify afterwards with pyrogallic and citric acid. In using iron it is absolutely necessary to hit upon exactly the right time of exposure, as a second too much or too little I find sufficient to mar the picture to a much greater extent than when pyrogallic is used. The extreme difficulty of obtaining good lunar negatives would scarcely be credited without actual experiment—the disturbing causes are so numerous, and apparently so trivial, and yet so often fatal:—a strong breeze in the upper regions of the atmosphere when almost calm below; night vapours and mistiness arising after a warm sunny day; or, when all the preparations are made, and the photographer at his post, perhaps at midnight, or often much later, cloudiness may set in and completely upset every chance of getting pictures. In so variable a climate as ours, the opportunities of obtaining really fine lunar negatives are like "angels' visits, few and far between."

The variation in size of the lunar negatives is much greater than would be supposed at first, but is of course owing to the moon's varying distance from the earth. I have here one plate of glass for comparison, a negative of the full moon taken at the period of perigee, or its nearest approach to the earth, and also one taken at apogee, its greatest distance. You will observe that the difference is very considerable; and in the after process of enlarging, where a stereoscopic combination is desired, the qualities of the two negatives are very different also, from the details of one being much more condensed than in the other; the enlargements will also differ to some small extent when brought up to the same size.

The principle of binocular vision is now well understood, and though the means taken are very different, yet the principles involved in taking a stereoscopic combination of the moon are precisely the same as employed in our binocular cameras for ordinary pictures. Though the moon is by far the nearest to us of any celestial body, yet such is her enormous distance, that, even if simultaneous pictures could be taken of the satellite, with telescopes placed at the extreme diameter of the earth, 8,000 miles, the stereoscopic effect would be very slight: the method adopted is therefore to take advantage of the librations of the moon, and, by obtaining pictures at different epochs, to afterwards unite them in the stereoscope. The libratory motion of the moon amounts in the maximum to $\frac{1}{3}$th, or rather more, of the whole apparent lunar surface; but the period of time occupied in travelling from one extreme to the other is frequently very considerable, from the change of position being both in latitude and longitude a still longer period must elapse. By this I would imply that the distance of time is often considerable at which it is necessary to take pictures for a stereo-combination in order to have them at the same age of the moon. The average time occupied in travelling from one extreme of libration to the other is not more thau fourteen days; so that if we take, for example, six lunations, and a given age of the moon, say sixty hours after full, it will be found frequently that for several consecutive months the variation is so slight as to give no stereoscopic effect.

The most successful combination I succeeded in making was one in which the first negative was taken on November 23, 1858, and the other side of the combination on October 11, 1859, being an interval of nearly 11 months, and which, as may be seen in the stereoscope on the table, is sufficient to give powerful relief. I think it a point of great importance to display clearly in lunar photographs the details of the surface, as well as the general effect to be good. I have here the original negative of the right-hand picture of this combination, and it will be seen that the display of volcanic craters, mountain ranges, and even in many instances the interior cones of eruption are very striking. The period chosen for this picture is about 60 hours past the full, a time in my opinion very admirably suited to obtain good images, and when the solar light falls on the moon with sufficient obliquity to produce strong effect of light and shade, at the same that it is almost, if not quite, the nearest to full moon at which may be reproduced at the gibbous edge those exquisitely sharp cusps and volcanic craters. The time of exposure required to produce a good picture is of course different, according to circumstances, and the age of the moon, perhaps an average exposure at full, was about 3′. I have succeeded in taking a very fine negative in a single second, but under very favourable circumstances.

I have here a negative of the crescent moon, four days old, which required 45′ to be successful, and even then but little detail is seen: the half moon required about 12′ on an average. I have invariably found that when the actinic power was highest I obtained the best pictures, as it is then there is least chance of any difference in speed between the telescope and the satellite.

I also exhibit here a series of negatives of the eclipse of the moon in February last. On the left hand picture the penumbra may be clearly seen, just commencing; and on each of the others, further advanced till the last, beyond which I was unable to obtain any result, in consequence of the reddish copper-colour of the moon, which appeared to leave after this point no photogenic action. The enlargement of the moon, which is before you, together with the print from the original negative, is from a negative taken on the evening of the eclipse, before it commenced, and shows more of the moon's surface than at ordinary full moon, on account of the moon, earth, and sun being at that time so nearly in a line, and thus allowing us to see very nearly the entire illuminated circle. However accurate and however unremitting may be personal observation of the lunar surface, it must, in many important respects, yield to the photographic representation, by which any disturbance thereon cannot fail to be brought under our observation; and a series of pictures, extending over a length of years, must of necessity be of the utmost value for future comparison.

The enlargement, and subsequent unity, stereoscopically of lunar pictures, is one of the most tedious and difficult operations the photographer can encounter; it is very unlikely that the two negatives are quite the same size, and still less likely that they have exactly similar photographic value, and yet, to be perfect, they must be made to intimately correspond in size and colour. My own practice, as being shortest ultimately, is to enlarge in the first place each negative separately, to about 1¾ inch, thus making a transmitted positive; these are again enlarged to 2 inches diameter, giving this time a negative, and the operation must be repeated until these two negatives have equal photographic value. They are then mounted stereoscopically on a stereoscopic plate, and fixed in front of an enlarging camera, in a slide made in such a manner that either image may at pleasure be drawn opposite the axis of a lens placed midway between the negative and the ground glass.

Each side of the moon is copied separately on a piece of glass, and the transparent positives thus obtained are afterwards cut with a diamond to fit a mount, having a circular opening for each side: they are then bound in the same way as book-covers, and are complete; but the utmost care is necessary in mounting the two halves to obtain true sphericity in the stereoscope, as the slightest aberration causes apparent flattening of one part of the moon, and excessive convexity in another.

PHOTO-ELECTROTYPE PLATES.

In the numbers of this Journal published on Nov. 15 and Dec. 1, 1860, were printed, *in conjunction with type*, two specimens of Herr Pretsch's new process of photo-electrotype. About the same period another specimen by the same process, *not printed with type*, was given with the *Journal of the Photographic Society*.

A contemporary thus alludes to the specimens issued respectively by the two journals:—

> The most recent contributions of photography to the printing-press is the process of Herr Pretsch for surface block-printing, which is, however, as yet in its infancy. The first specimen we saw, which was printed with great care, and issued in the *Journal of the Photographic Society*, possesssed many excellences, and was full of promise; the last issued specimen, in our Liverpool contemporary, was so much inferior that it tended to destroy that promise. It is, we doubt not, capable of further improvement; and if it can be made available for general subjects, Her Pretsch will have contributed one of the most valuable improvements issued in connexion with photography.

We fear our friend the editor is rather prone "to hint a fault." Herr Pretsch's process was designed to serve the purpose of book illustration with ordinary letterpress, and to take the position now occupied by wood engraving for that purpose.

Of course the proper method of testing the capability of the invention was to print from the blocks when "made up" in "forme" with type.

The publisher of this Journal stipulated with Herr Pretsch that such should be done, and that as much care as possible should be used, consistent with a fair test, in "bringing-up" and printing these blocks. The specimen given with the London Photographic Society's Journal was *not* so printed. Hence, if the editor possessed the necessary technical knowledge, in common fairness he ought, for Herr Pretsch's sake, to have stated the whole facts. There could be no mistake, if our contemporary gave due attention to the subject of his comments, as to the difference of the specimens so sent forth to the world.

We attach great importance to this invention, and none the less from the appearance of the impressions printed in this Journal, which were not "cooked," but were printed at the rate of one thousand an hour—the specimen given on Dec. 1st being printed with an ordinary cylinder machine.

We again congratulate Herr Pretsch on the results of this test, and say emphatically the impressions were *not* "inferior" to the London specimen, when the circumstances of production are considered. If so much has already been realised by the inventor, when his process is comparatively new, we are convinced that when further improvement has been made—which we understand to be in progress—"Herr Pretsch *will* have contributed one of the most valuable improvements issued in connexion with photography."

ON SILVER AND SOME OF ITS SALTS.

By J. T. Taylor.

[Read at a Meeting of the Photographic Society of Scotland, on Tuesday, Jan. 8, 1861.]

The present paper being hurriedly written at a few days' notice, it is quite impossible that anything like justice can be done to one of the most important subjects in connexion with photography—"Silver and its compounds, chiefly in their relation to photography."

The importance of this will be understood when it is considered that of the two sciences on which photography is based—chemistry and optics—the latter, in its application to photography, is considerably nearer perfection than the former. And it is only by a careful study of the changes induced in metallic salts generally, and argentiferous salts in particular, that progress can be hoped for. That photographic optics is nearer perfection than photographic chemistry is doubtless owing to the fact that the one problem was incomparably more easy of solution than the other. Indeed I fear it may be said, with too much truth, that neither the one science or the other has (in their relations to photography) made any considerable progress for the last twenty years. Since photography (I allude now more particularly to *negative* or *camera* photography) was published by Fox Talbot, there has been no discovery or modification of any great consequence, with the exception of the discovery of the peculiar suitability of collodion as a medium in or on which to form the layer of iodide of silver. Great have been the advances in manipulation, and numberless the little petty improvements made in carrying out these general principles; but I repeat that in the principles of photography, as practised over the whole known world at the present time, little or no changes have been made. As with chemistry so with optics. The portrait combination of lenses now in daily use is almost a *facsimile* of Petzval's lens, as made by Voigtlander many years ago (1843). But I must ask pardon for this digression, and return to the subject in hand. The salts of silver being pre-eminently adapted for photography, from the loose and unstable nature of their affinities, it is important and desirable that still further research be made into their various properties, especially by studying their action when in combination with other salts, such as those of gold, tin lead, and others.

In the present remarks everything of a theoretical or speculative nature will be carefully avoided; not by any means that I deem them unimportant, but that, for the very opposite reason, I consider them by far too important to be introduced into a paper written like the present at a few days' notice.

I will first of all notice briefly the metal itself. Silver is found in various forms and in many parts of the earth. It abounds in lead mines, from which metal it is largely extracted. It is also found in the forms of iodide, chloride, bromide, sulphuret, and other salts. It often accompanies the sulphuret and chloride as native silver in a crystalline or arborescent form; and in the museum of Copenhagen is a large mass of amorphous native silver, weighing about 500 lbs., which was procured from a mine in Norway.

Silver is of a brilliant white colour, and is susceptible of a high degree of polish. Its bright appearance, however, may be converted into a very beautiful matted frost by the simple operation of immersing the metal, previously heated to a dull red, in a weak solution of sulphuric acid in water—a few drops to the ounce. Silver dials of watches, and various articles of jewellery, are thus frosted or "whitened," as it is technically called.

It is commercially difficult to procure pure silver. The coin of the realm, as also all silver plate, are adulterated or alloyed with copper to render them harder and more durable, the metal in its absolutely pure state being very soft. The quantity of alloy in silver plate or "standard silver" varies in different places. The standard being rather lower in Edinburgh than in England, articles of plate made here, and stamped at our Goldsmiths' Hall, are slightly inferior in quality, and consequently of less value, than than those made and stamped in London, Birmingham, or even Glasgow.

The value of silver is not *fixed* like that of gold, but variable. At present the commercial value of standard silver is 5s. 3d. per

ounce troy—chemically pure silver being worth about sixpence per ounce more.

Silver coin as issued from the mint is not intrinsically worth the sum which it represents. A new sovereign is intrinsically worth twenty shillings value, but a shilling is only worth about elevenpence. Passing from the metal itself to some of its compounds, we naturally begin with—

Nitrate of silver, or, as it should more strictly be called, nitrate of oxide of silver. This important salt is easily made by putting silver into nitric acid, which in a few minutes—more or less according to the quantity—is completely dissolved. By the application of heat this is formed into a mass of crystals, which may be removed and preserved for use. I regret that this beautiful and very simple operation of making nitrate of silver cannot be conveniently shown here tonight, as the fumes which are given off when the metal is being dissolved are not pleasant. Amateurs, who for the first time are about to make this salt, may be apt to imagine that something is the matter with the acid when, on adding the silver, no dissolution appears to take place. The application of a slight degree of heat will, however, soon cause the action to commence, after which it goes on with considerable rapidity.

I usually make my nitrate of silver in a glass dish resembling a tumbler, though somewhat larger, for which I have a loosely-fitting glass lid; sometimes, however, I use as a cover a bit of glass laid over it—not such a tight or close fit but that the fumes generated can find a way of escape. After the silver is dissolved it should be poured out into a flat dish and exposed to a slight degree of heat. I prefer a glass dish for this purpose, although a china plate forms no mean substitute. Evaporating dishes for this and similar purposes can be bought at a cheap rate at the chemists'. Exposure to heat serves to drive off any excess of acid which may remain, and hastens the formation of the crystals which, as the liquid cools, will be found to be rapidly formed in transparent and colourless tables, the appearance of which is too familiar to the members of this Society to render any description necessary at my hands. The size and beauty of the crystals depend upon the amount of heat to which the solution has been subjected in evaporating. When these crystals are subjected in a proper vessel to a certain amount of heat they fuse, and may be cast into cakes or sticks. In this way is made lunar caustic, which is much used by surgeons for destroying fungous excrescences.

There are often complaints as to the adulteration of nitrate of silver. Certainly few if any substances used in photography can be adulterated with less trouble or more difficulty of detection to an inexperienced amateur; not that there is any real difficulty in its detection, but it is only by means and appliances not always within the reach of every amateur. The substance mostly used in this adulteration is nitrate of potash, which, being easily procured at a cost of less than a penny an ounce, is, when thus fraudulently used, capable of causing a handsome profit to accrue to the dishonest dealer. Of course, manufacturers of respectability would not stoop to such nefarious practices; still it is a fact that there is much nitrate of silver so adulterated. During the spring of last year a gentleman, who had purchased a considerable quantity in the south of England, told me that this silver had this peculiarity, that, in order to get desirable results, he had to almost double the quantity of silver usually required. On an examination of a sample of the crystals which he sent me, I found a very large number of crystals of nitre mixed with them. These, no matter how minute, were very easy of detection when placed in the polariscope; and, on subsequently analysing the silver, with a view to ascertain the extent of the adulteration, I found it to exist at fully more than one-third. In detecting the adulteration of nitrate of silver the so-called argentometers, of the hydrometer make, are utterly worthless. Indeed this instrument is of no use for testing the strength of any solution of silver (a collodion-exciting bath, for instance), unless when the solution is altogether uncontaminated by foreign substances. It is evident that an old bath, which has been for some time in use, cannot so be tested with anything at all approximating to accuracy of results. One of the easiest ways of testing the quality of crystals of nitrate of silver is to take an ascertained weight—say, for exactness, 170 parts of it—(170· being the equivalent or combining proportion of nitrate of silver). This having been dissolved in distilled water is precipitated as chloride by the usual means. The equivalent of chloride of silver is 144·, or, more strictly, 143·5. Hence it follows that, if the nitrate of silver be pure, the 170 grains or parts which were dissolved will have produced 144 grains of chloride of silver. The extent of departure from this indicates the extent of adulteration. An ounce of silver, when dissolved in nitric acid, yields rather more than an ounce and a-half of pure nitrate of silver. In strict language, the proportion of nitrate of silver obtained from one ounce of the metal is one ounce and a-half and 744 parts of an ounce.

I have said that it is difficult to obtain pure silver commercially; but nitrate of silver may be made thus from ordinary standard silver:—The silver, having been dissolved and crystallised in the usual way, will be found to be of a bluish colour, owing to the nitrate of copper present, for standard silver contains $\frac{1}{11}$ of copper. This copper may be got rid of by the following means:—Into a porcelain or other convenient vessel put the crystals, and subject them to heat over the gas or spirit lamp. The heat oxidises the copper, rendering it insoluble in water; hence, if the operation be properly conducted, and the crystals again dissolved in water, the copper will remain at the bottom in the form of a black powder, pure nitrate of silver remaining in solution. An argentometer is useful in such a case as this, as by its means the strength of the silver in grains to the ounce of water may be ascertained.

To amateurs who may feel inclined to make their own nitrate of silver from such material as old spoons, coins, and such like, but who may yet be rather disinclined to be at the trouble of getting rid of the copper which is present, I will here offer the results of my own experience in working with some silver solution which I made from the material just indicated, and from which the copper was not removed. The quantity of silver I made was enough to fill my large bath of fifty or sixty ounces with a thirty-grain solution, and, in addition, about a dozen ounces of a sixty-grain solution for printing. I tested the collodion bath side by side with one of the same strength of pure nitrate; and the result of several careful experiments was, that beyond the pale blue colour which characterised the nitrate of "standard" silver, there was no difference whatever between the working of the two solutions—one was, in every respect, the same as the other in sensitiveness, cleanliness of development, and density. Those transparencies and negatives which I exhibited on the occasion of Mr. Macnair's bringing under the notice of the society the use of wort as a preservative for collodion plates, were all produced by means of this copper solution of silver. The sixty-grain solution for positives must receive a similar character to the other. In the prints produced by means of it, the whites are as pure and the tones as deep, while the papers are as sensitive and preserve their sensitiveness as long as similar papers prepared with absolutely pure nitrate of silver. If a solution of nitrate of silver be alkaline, and it be desired to be neutral, the cautious addition of distilled water, slightly acidulated with nitric acid, will at once effect this. According to the alkalinity, so must be the addition of the acid solution. Care must be taken to intermix thoroughly and test after each addition. To render an acid solution neutral, all that is necessary is to add oxide or carbonate of silver in excess. The free acid is thus got rid of at once. I myself always prefer the carbonate of silver for this purpose, and can recommend it to others. When added to a solution containing free nitric acid, the silver immediately leaves its old master and flies to its new one, and the carbonic acid, finding itself not at home in its new quarters, loses no time in making its escape as gas to the surface. By putting a piece of metallic copper into the solution of nitrate of silver, the silver is precipitated as pure metal, the nitric acid, which formerly combined with it, now entering into combination with the copper. This is an excellent way of reducing an old nitrate bath which may be unfit for use.

Carbonate of silver may be formed by adding bicarbonate of soda to a solution of nitrate of silver, in the proportion of twelve parts of the soda to twenty of the silver. Their exact combining proportions are 84 and 170; but great exactness is not required, provided always that the soda be in excess, to ensure complete conversion of the silver. I may here state, once for all, that in all cases where salts like this—insoluble in water—are formed by double decomposition, it is necessary that they be thoroughly washed by repeated changes of water. I here illustrate the formation of carbonate of silver, which is that dense white precipitate formed when I pour the solution of carbonate of soda into that of the nitrate of silver.

Oxide of silver, or, in the present case, protoxide of silver (for there are three oxides of this metal—the protoxide, the suboxide, and the binoxide), is readily formed by adding a solution of caustic potash to a solution of nitrate of silver. The brown precipitate is oxide of silver. This is soluble in nitric and some other acids, in ammonia, and even, to a small extent, in distilled water. Like the carbonate, the oxide of silver may be added to an acid bath in

order to neutralise it. When so used, it leaves the bath slightly alkaline, which may be cured in the usual way. I here proceed to make this preparation, all that is necessary being to pour the solution of caustic potash into the nitrate of silver. When the oxide of silver is heated to redness, the oxygen is set free, and metallic silver formed in a spongy condition.

Cyanide of silver is usually formed by the addition of cyanide of potash to nitrate of silver. The equivalent of cyanide of potash is 79, the other being 170. The precipitate cyanide of silver is readily soluble in cyanide of potash, and, when so dissolved, forms electroplating solution. This solution (for electroplating) is also formed by dissolving oxide of silver in the same solvent. In practice, however, I find no difference in working between these and a solution made as I shall now show you. Into this solution of nitrate of silver I pour cyanide of potash. A dense precipitate ensues; but, by continuing the addition of the solution of cyanide of potash, the precipitate is again dissolved, and the liquid becomes clear and colourless. I now immerse a piece of brass in this solution for a few seconds, and on taking it out it is coated with pure silver. The addition of six or eight parts of water makes this a very excellent plating solution.

Chloride of silver is made by the addition of such a salt as chloride of sodium to nitrate of silver. It is thus formed in the texture or on the surface of sensitive papers for printing, only in such a case it is necessary to have an excess of nitrate of silver. It is soluble in hyposulphite of soda, in cyanide of potash, in ammonia, &c. It may be readily converted or reduced into metallic silver by putting it into a porcelain dish with water to which has been added a few drops of sulphuric acid. On immersing a piece of iron or zinc the reduction is effected in a few hours.

The iodide of silver next claims our notice; but, from the length of this communication, it must be treated in a more summary way than it deserves. It is to the glorious discovery by Daguerre and Talbot of its capability of receiving a latent impression that, humanly speaking, we owe photography. Perhaps the only case analogous to this remarkable discovery in the world of science is that of Le Verrier and Adams in connexion with the discovery of the planet Neptune. The iodide of silver of Daguerre was formed by the direct contact of the elements, the fumes of the iodine acting on the surface of a polished silver plate; while the iodide of silver of Talbot was formed just in the way we are doing at the present day—in every collodion plate dipped into the nitrate of silver bath—viz., by double decomposition. When iodide of potassium is brought into contact with nitrate of silver, the silver, true to its nature, leaves the old master in favour of the new, and iodide of silver is the consequence. When this salt is exposed momentarily to light, a process of reduction is induced which may be continued by chemical agency. In the early days of the art it was found that while the blue ray alone of the spectrum had the power to originate this reduction, the heating rays at the other end of the spectrum had the property of continuing this action. Soon after Becquerel published this discovery I made a lengthened series of experiments to determine how far this would be practically useful; but I regret that I cannot just now lay hands on the notebook containing the results of these trials. By judicious additions to the iodide of silver of free nitrate of silver, gallic acid, and perhaps other substances to me unknown, the sensitiveness is considerably increased; and a photographic plate so prepared may be developed by gallic acid, pyrogallic acid, or sulphate of iron, but preferably with gallic acid and acetate of lead mixed together. Bromide, fluoride, and other salts of silver, are formed by decomposition from the nitrate, in the same manner as the other. Ammonio-nitrate of silver is sometimes used for exciting salted paper for printing, in preference to a simple nitrate. It is thus prepared:—Into a solution of the nitrate of any strength add strong ammonia. Its action will be similar to what was seen in the formation of the cyanide of silver. In the first place, oxide of silver is precipitated, which is redissolved by the addition of more ammonia. Care should be taken that no more ammonia be added than is barely sufficient to redissolve the oxide. Paper prepared with this is very sensitive to coloured rays; and, if exposed to light under the action of variously-coloured glasses, the result will be found to be strongly impressed with corresponding colours. To obtain the best results, the paper should be salted with the chlorides of barium or ammonium. I must pass over the other salts of silver, whether simple or compound, merely from want of time to take notice of them. I may observe, however, that at one time it was thought that what Mr. Hunt calls the fulminate of silver was, from its very unstable equilibrium, likely to produce some important results in photography; but I have no doubt that the great danger attendant on the preparation of fulminating silver has wisely deterred men of science from perilling their lives in endeavouring to obtain a knowledge of the properties of this potent substance. There are some very beautiful features about this metal which would require another paper to treat of them with justice. One or two I shall merely indicate:—If certain substances—a dead moth, for instance—be immersed in a solution of nitrate of silver, and then exposed to the fumes of phosphorous, the silver is reduced with a brilliant metallic appearance, and a most beautiful object is the result. If ammonio-nitrate of silver, to which has been added grape sugar or other reducing agents, as oil of cloves, oil of cassia, &c., be poured on a plate of glass, the silver is reduced, and being attached firmly to the glass a most brilliant mirror is thus produced. The exact proportions recommended by Mr. Drayton, the patentee, are—

Ammonia	1 part.
Nitrate of silver	2 parts.
Water	3 „
Alcohol	3 „

Filter, and add one-fourth part of grape sugar, dissolved in weak spirit.

I may conclude by stating that when a weak solution of nitrate of silver be desired to be very much concentrated, I have always found the best and readiest way to be by the application of intense cold produced by freezing mixtures. Water, when congealing, ejects all foreign matters; and under this treatment water crystals are speedily formed which, when removed, leave the solution strengthened in any degree.

The exact way I proceed is this:—Into a dish (capable of holding another thin glass dish, in which is placed the nitrate of silver solution) pour a mixture made as follows:—

Muriate of ammonia	1 part.
Nitrate of potash	2 parts.

Mix intimately, and call this compound No. 1. Crush common washing soda into a fine powder, and call it No. 2. When about to use, mix equal parts of 1 and 2, and dissolve into the smallest possible quantity of water: this is done into the above-mentioned dish.

One jotting more, and I have done. Stains may be removed from linen, the skin, photographs, &c., by

Spirits of wine	20 parts.
Iodine	1 part.
Nitric acid	1 „
Muriatic acid	1 „

Mix these, and apply to the stain, which is at once converted into iodide and chloride of silver, which may, in turn, be removed by any of the usual solvents, cyanide of potassium or hyposulphite of soda.

COLLODION: IS IT INERT IN THE FORMATION OF THE PHOTOGRAPHIC IMAGE?

By R. H. Preston.

Allow me to present to your readers an account of a few simple experiments, having reference to that most interesting question—the composition of the photographic image; and undertaken with the impression that pyroxyline is not so passive in its character of mechanical support to the iodo-argentine layer as is generally supposed.

An ordinary glass positive, complete and dry, was moistened with water, and flooded with undiluted nitric acid. The metallic lights of the image rapidly disappeared; but beneath the fluid—absolutely insoluble, even by prolonged contact—a somewhat faint but perfect picture remained, on which the features of the original portrait were easily recognisable, the definition and vigour increasing with drying.

To annihilate a suspicion that this relict consisted of some hydracid compound of silver, which the volume of superposed metallic deposit had shielded from the action of the primary fixing agent, a strong solution of cyanide of potassium was employed after the removal of the acid, but without manifest effect.

The irreducibility beneath the influence of these powerful agents abbreviates the catalogue of argentine products which could constitute the impression, unless indeed we entertain the idea of an heteromorphous or allotropic state.

The film was subsequently washed and treated with a solution of pyrogallic acid, with which was associated a little nitrate of silver. Emerging from invisibility by transmitted light, the portrait gradually became dense, until the obstructiveness equalled that of its primitive condition, and was progressing towards greater

intensity, when the film broke, and floated off the plate. The shadows during redevelopment, probably from the action of the preceding solution, became somewhat misty.

Excepting the rather irrelevant part of bi-development, I have repeated the manipulations with various collodions, the results being identical in general features; but I have apprehended a greater pictorial prominence in some cases.

I refrain from premature deductions. Perhaps the facts and their tendency may be the subject of a few comments.

ON FRAUDULENT CHLORIDE OF GOLD.

By R. Reynolds, F.R.S.

The consumption of chloride of gold in photographic printing is very considerable. As many chemists deal in the article it is proper that they should be put upon their guard against frauds which have deceived several parties. I therefore give the results of the analyses of chloride of gold from three distinct manufacturers, which I have recently made; and, although reserving the names of the guilty parties, shall probably take some future opportunity of examining their products.

All the samples referred to below were bought as chloride of gold, no mention of "non-deliquescent" being made by either buyer or seller.

The following are the results of the examination:—

"A. B."

Three "fifteen grain" bottles taken at random, without removing wrappers. Contents were as follows:—

No. 1	11.7	grains
„ 2	11.9	„
„ 3	12.0	„
Average	11.87	„

One "sixty grain" bottle taken as above, contents 54 grains.

No. 1 was submitted to analysis:—

Gold 4.4 grains = Terchloride of gold	6.75	grains
Chloride of sodium	3.80	„
Moisture and free acid	1.15	„
	11.7	grains

As some makers of fraudulent chloride of gold reserve as a loop-hole the fact that the double chloride of gold and sodium is sold under the term of "non-deliquescent," and have the audacity to assert that no other is in the market, I give the composition which this should have had, even had it been the true double salt, although the preliminary notice shows that it was not sold as that. Terchloride of gold, 6.75 grains, would have combined with chloride of sodium 1.30 grains. Consequently there is an excess of chloride of sodium of 2.50 grains, simply diluting the mixture.

"C. D."

One "fifteen grain" bottle taken as above, contents 15 grains.

Analysis.

Gold, 7.25 grains = Terchloride of gold	11.12	grains
Chloride of sodium	not a trace	
Moisture and free acid	3.88	grains
	15	grains

"E. F."

This was a solution labelled thus:—"Neutral Solution of Chloride of Gold, guaranteed to contain 7 grains of pure gold, equal to 15 grains of crystallised 'non-deliquescent' chloride of gold."

Analysis.

Gold, 6.6 grains = Terchloride of gold	10.12	grains
Or = Chloride of gold and sodium	13.26	„

The solution did not contain any chloride of sodium.

Practical Results.—Assuming "C. D." to be sold at a fair market price, the excess of profit over this to the maker of "A. B." is as follows, and, of course, the loss to the consumer is the same:—

On short weight (Being average of three bottles)	21.0 per cent.
On lower quality	10.7 „
	31.7 per cent.

As, however, "A. B." was sold at 8.3 per cent. lower price, the sum will stand thus:—31.7 less 8.3 = 23.4 per cent. excess profit, or £23 8s. on every £100 worth sold.

The samples "C. D." and "E. F.," although not theoretically pure chloride of gold, may be considered to be commercially honest articles. The deliquescent nature of the pure chloride renders it a difficult operation to fill the bottles with accuracy as to weight, and the varying amounts of moisture which the maker may leave in the salt will always be a source of discrepancies in value.

The former difficulty may be overcome by sending out the solution instead of the solid chloride. I know of no reason why such solution should not be valued by its theoretical equivalent of gold, excepting that the practice of the trade has been going in another direction, and the change would involve an apparent, though not a real, advance of price, to the consumer.

At the least, purchasers should require a guarantee of seven grains of pure gold in each bottle corresponding to the gramme, whether the contents may be solid or in solution.

THE CAMERA OF HORRORS; OR FAILURES IN THE WET PROCESS.

By O. G. Rejlander.

[Abstract of an Address given at a Meeting of the Birmingham Photographic Society, on Tuesday, the 18th December, 1860.]

In opening his remarks, which were of a conversational character, Mr. Rejlander stated that it would be quite impossible to embody in a "paper" the different causes and effects he had met with in the practice of the art. He had arranged somewhat in a systematic manner the various specimens, and would describe each briefly as he proceeded. He also stated that he had a strong objection to *developing boxes*, and other appliances for external purposes. The difficulties he had to contend with arose from many causes:—the *bath*, the *glasses*, *collodion*, *dust in summer*, *cracks in and under the varnish*, &c. &c.

The Bath (which Mr. Rejlander explained might be exposed to light for any length of time without injury).—A perfectly *new* bath—whether it arose from the glass, the dipper, or other cause—was often found covered with scum or iridiscent dew of reduced silver, which could only be removed by filtration or skimming. That, on the first occasion of dipping the collodion plate into it, covered it—perhaps not entirely, but partially. The opaque silvery parts stuck to the collodion. When the plate was exposed no effect was produced on these silvery spots; but, on developing and washing, their position on the plate was left perfectly transparent, or they produced transparent black spots on the negative. There was also another kind of scum which, when the plate was dipped, produced a kind of *marbling* like that used by bookbinders. Those streaks were attributable to what had floated upon the bath, and dependent upon opaque silver particles; also *water marks*, similar to moire antique, but more equal, due to the presence of water in the collodion or measure glasses. Although from his first attempt at photography he had used the same collodion—whether it was attributable to himself or the maker—still he had continually met with these *water marks*, and at times for a period of half-a-year successively.

The Glasses.—It might be thought no difficulty existed on obtaining them *pure* and *clean;* but there was great difficulty in so procuring the glasses. In producing some he had met with, and explaining his own difficulties and evil doings, his object was to show and warn others not to trust too implicitly to a chapter of accidents—to glass manufacturers or chemists—but to obtain the *best* of everything they required for their use, availing themselves as far as practicable of the experience of others in their selection.

Glasses were frequently marked, from one lying partially over or across another; and were also at times met with having *chalk* marks (trade marks), which were not seen before the glasses were used, and did not show on gently breathing over the plate—the usual mode of detecting the presence of impurities on the surface. He exhibited two negatives which were completely spoilt from these causes, and invited members to take home and clean the plates, subject them to similar treatment as an ordinary plate, and produce them at the next meeting with the view or object taken, &c.

Another source of annoyance arose from a subtle and invisible deposit forming upon the plate while lying under water, as spoilt plates are usually placed before cleaning. If the water was dropping, say from water works, the deposit was stronger. This was caused, in his opinion, by lime, alkaline, or metallic impurities in the water; and its removal was rendered exceedingly difficult, although absolutely essential, as it would be found to have eaten into the *pores* of the glass. He suggested that plates should not be left lying in, water for a day or longer, as all water was subject to precipitatea although such was quite invisible to the eye.

While on the subject of glass he would take occasion to say a

word on glasses in printing frames for negatives. These were generally a quarter of an inch or more in thickness, and on them in a great measure depended the time required for the actinic action upon the prints. He at one time had a glass with which he could print in from ten to fifteen minutes, while with all others he had met the time required was thirty to forty. This glass appeared of a pure *blue* when viewed edgeways. Those generally in printing frames appeared *green* under similar circumstances. For a *thin* negative it would be advisable to use a *green* glass; and a photographer, by testing the capabilities of his various glasses, might readily adapt them to the particular requirements of his negatives. The slowest glass for printing purposes was not quite *green*, and he was at a loss to describe the peculiar tint. It was a kind of opalescent flinty green; and this tint required, for the percolation of light, *treble* the time of common green or common bluish glass. The difference between ten and twenty minutes in printing was entirely referable to the glass.

The Collodion.—He would suggest great care in pouring the collodion from the bottle on to the plate, as oftentimes a portion of the thickened collodion from the neck was carried to the plate; and, though it was not at times very important, still it was liable to assume an ugly aspect. He had also found the collodion film upon the same plate perfectly *transparent* in parts and *thick* in others.

Dust.—From the dust in a hot and dry summer he had experienced much annoyance. The shutter might not fit very close, and in the anxiety to close it as quickly as possible the dust, which had and would collect, was scattered upon the film. He had always found it a difficult matter thoroughly to dislodge the dust both from his camera and operating room, a sudden draft or shake causing a large quantity to arise, as could plainly be seen at any time in a sunbeam. To prevent as far as possible the dust accumulating in the camera, and to render it more easy to clean, he had adopted with good effect papier maché to round off the corners.

Cracks.—Of cracks in and under the varnish he exhibited specimens, which (magnificent pictures *otherwise*) had been completely ruined from those causes.

He had often met with a nucleus of transparency without any apparent foreign substance to account for it; and amateurs would find a fruitful source of annoyance from surface decomposition from a reflow, the plate not being properly drained.

Condensation or fog upon the lens had to be contended with, resulting from the variation of temperature in the different portions of the lens, and consequent upon its removal from one room to another, or even changing its position in the open air.

He stated that, about a fortnight before, with a copper-coloured sky and easterly wind, he took a negative of a mastiff. When developed there was no trace upon the plate except the position of a pure white streak upon the nose of the dog. As the first photograph was not generally correct as to pose, &c., and wishing to obtain an accurate and at the same time pleasing picture, he took the exposed plate into the open air for the purpose of detecting, if possible, the impression, and was rather amused to perceive it gradually inclining and very shortly changing to a very fair positive.

He would also hint that if a negative had by any means got damp or wet, it was not advisable to dry at a fire; but the drying should be steady, in an equable temperature. He had found that a negative might be slowly dried without injury.

At the close of his address, of which we have given only a summary, Mr. Rejlander remarked that if the manufacturers of photographic paper would each furnish him with a sheet, he would undertake by the next meeting to print a *hard* and *soft* negative on each, similarly toned, &c., and produce them for the inspection and discussion of the members.

A PHOTOGRAPHIC RETROSPECT.

By Charles Buttebfield.

[Read at a meeting of the Bradford Photographic Society, Wednesday, Jan. 2, 1861.]

In our ordinary life, at each return of this season—when the old year, with its hopes and fears, its anxieties and struggles, has passed away—it is pleasant to rest for a moment in our wrestling with the world, and, before we again address ourselves to our daily labour, to look back on the year that has gone by. The page of life we have looked on for twelve months is now turned over and lost to us for ever, save in memory. To look back on this year and pass in review before us, one by one, the events which have been to us its prominent features, it is well to have some halting-place like this—some apparent rest in our hurried race to the end.

I cannot help likening ourselves, at such a time, to travellers on our modern railroads: we sit calmly gazing on the scenes flying so quickly by, ourselves apparently stationary, and almost forgetting how we are hastening on to the great terminus of life. Thoughts like these are passing through my mind as I sit by the fire at midnight on the last day of 1860. I was sitting up, as is my usual custom to do, to "see the new year in"—not that there is any visible difference to mark the event, or that twelve o'clock on the night of the 31st of December is not like twelve o'clock on any other night; but because we know that at this hour one of those periods into which we have parcelled out time has come to a close—it exists in our fancy as a tangible point, and we almost expect to see some manifestation of the fact of its passing away. Strange long-forgotten memories crowd upon us at these times: my thoughts, by some strange magnetism, went to the days of my boyhood; I see myself seated in the crowded schoolroom, and once more hear the busy hum of my schoolmates; I look around and see the dunce of the school sit in his accustomed place, poring over his dog's-eared book, and looking the very impersonation of abject, mental bewilderment. Poor fellow! his was no pleasant time: continually cuffed by his master and jeered at by his juniors in years but seniors in wit, he goes through his allotted drudgery in stupid sullenness. What a martyrdom! greater far than we could now believe. The sorrows we have passed through have grown less in looking back upon them, and we wonder why we then felt their griefs so keenly.

I have been speaking of no imaginary person: I met this same dunce yesterday. He is well to do in the world, and sits by his own fireside perhaps, just now, recalling, like myself, "the thoughts of bygone hours." Nine years ago I was a pupil at this very school I have in imagination placed before you. I had been there some time, and was therefore an "oldster." I could look down with contempt on the "youngsters" of the "fourth form," fresh from home. My place was on the "first," near the fire in winter and the door in summer. I had many privileges to which my service had entitled me, and one of them was that of perusing certain books, the property of our head master: amongst them were several volumes of the *Mechanics' Magazine*, and it was through this medium I first became possessed of the knowledge that such a thing as photography existed. Do not suppose for a moment that our art had attained the dignity of cameras and lenses purposely adapted to its wants: nothing of the kind existed—at least I had never seen such things, and, if I had, it would have been all the same. I might have looked and longed, as little boys do before pastry cooks' windows, but that would have been all. The state of my finances utterly precluded any such idea as buying the things to be entertained for a moment. No! I must be content to follow very humble paths. Therefore, as a commencement, I invested a penny on some bichromate of potash; and I well recollect, when I held the yellow blocks in my hand, how a sort of pride warmed my breast to think that I, so young, was going to use an article having such a portentous and learned name. I could scarcely run home fast enough, and, when arrived, was all impatience till I had *bolted* —not swallowed, my tea; then, getting some hot water from the kettle, I dissolved my precious yellow salt in it, and prepared my first photographic papers.

The next day being Saturday, I printed everything I could lay hands on—all was fish that came to my net. I was overjoyed with the results, meagre as they would be considered now, and never cared that the lights and shadows were all reversed: the pictures were there—veritable copies of every line of the originals—and what cared I whether these lines were light or dark?

In looking over some old papers, I found a few of these my first prints, and have brought them with me, thinking, perhaps, they might interest some of you who have only known photography since it has grown up, and were not (like myself) acquainted when they were children together. These specimens were fixed by simply washing in water, which dissolves out the unchanged bichromate, but leaves the rest intact. Later on I used to mix a little sulphate of copper with the bichromate of potash, and then, after exposing to light, I washed the paper over with nitrate of silver, whereby the pictures were changed from negative to positive. You see I became ambitious as I advanced; and, what pleased me so much at first, I soon learned to look at with something like contempt.

But a still greater change was coming over me: I had indistinct visions of arriving at the dignity of copying "the human face divine." I had the details of a plan in my head: I thought of it by day and dreamed about it at night; at last it became a great fact. I procured a camera and lens. Do not fancy I had "begged, borrowed, or stolen" sufficient to purchase a French-polished affair

such as, no doubt, is present to your imaginations. Nothing of the kind; my mountain, which had been so long in labour had only brought forth a mouse after all. The camera with which I purposed to take my first portraits was—a cigar-box fitted with a spectacle glass! With this simple instrument I essayed to make my first study from nature.

But reflecting that my bichromate pictures took some thirty or forty minutes to print, and that the rays of light would certainly be much diminished by passing through the spectacle glass, I thought it just possible I should not be able to find a victim who would sit for his portrait for that length of time, though, such was my enthusiasm, I certainly would have done it myself could I have focussed the image also. Under these circumstances I thought I had better content myself with still life; and therefore I directed my lens at the opposite buildings, on which the sun was shining strongly, and then galloped off to school, there to pass the hours in a continual fever of expectation till my time of release came. Arrived at home, breathless, I ran to my camera, not without misgivings that in my three or four hours' absence it might have been displaced; but no! there it was in *statu quo*, and I carefully put the cover on my lens (a needless precaution, one would think, after such an exposure), and went down stairs into that refuge of photographers—the coal place—to take out my paper.

I pull out the slide, my eyes dive through the glass front and the paper beneath. But ay! What! How is this? The paper is "as you were!" There is not a trace on it!—not even a darkening where the sky should have been! I look at it again, thinking I must have put in plain paper; but no, for on taking it into the sun, I find it darken very perceptibly. Then, how is it? I could not imagine at first, but in time the conviction slowly dawned upon me *that the exposure had not been sufficient*—four hours, and not enough!—even my patience could not sit so long for a portrait, so my cherished hopes were dashed to the ground, and I was in despair.

Time passed on, however, and, like falling snow, soon obliterated all traces of my disappointment. I tried another process, one that required great manipulation—at least for me; but I got some results—at least, my brother, after sitting staring into the Polyphemus-like eye of my camera for four minutes, declared he could sit no longer, much to my disgust; but, however, in taking out my slide and waiting (for the pictures by this process developed themselves), a something made its appearance which I exultingly carried to my brother as his portrait, but which might as well have answered for Bishop Berkeley; only I can't say that I ever heard of Bishop Berkeley wearing a blue and white spotted belcher round his neck, which was the case with my brother on this particular day.

I struggled on for some time with this and other processes until the discovery of collodion; and then having left school, and my pocket being better able to bear the increased demand upon it, I "went in" for collodion in the wet state—dry plates were as yet unborn. I had the usual misfortunes, of course: my bath would go wrong, and I would persist in doctoring it when I had better have left it alone; my collodion could not boast of being always free from specks and comets; nor was I ever seen without plain evidence of my evil practices and study of the "black art" in my fingers and linen. Now, these things never happen now-a-days. Oh no! —they must be set down to my ignorance and clumsiness.

A year or two passed over in this way, and at the end of that time, during the interregnum of winter, I had made myself a tent, which one or two of you present tonight have no doubt seen. With this on my back, and a carpet-bag full of bottles and sundries, including a clean shirt, &c., which I had wrapped up in an oil-case lest it should be dyed black with nitrate of silver when I came to put it on, I set off one fine morning in spring to take photographs of something else than stone walls and chimney-pots. I had a friend with me who had lately caught the photographic fever, and was nearly as bad as myself, excepting that mine was a chronic case, and his more recent. I am happy to say he has since quite recovered.

We travelled some distance by rail, and then shouldering our apparatus, we trudged along the road as though the weight we carried were feathers, and not substantial bottles, &c. Arrived at the banks of a picturesque river, we sat down and relieved our weary shoulders of their burden. Then pitching the tent, I prepared a plate, exposed it, and finally sat down on the rock, near the brink of the stream, my companion temporarily snuffing me out by placing the extinguisher-like tent over my head.

Now came question after question from my friend outside. "How does it look?"—"Are there any specks?"—"Does the sky blacken well?" (the great desideratum in those days). These I answered favourably, and proceeding in my "labour of love," scarcely noticed that my friend was shouting outside, until attracted by the alarming words—"There's a bull, and I can't keep him off!"

Imagine my position. Seated on a stone within a yard of the river's brink, and expecting every moment to be charged and hurled over into the stream by the enraged brute outside, and yet I could not go out of the tent! No—I had not yet fixed my picture: the light would inevitably spoil it. I would stand, or rather sit, my ground; and if I should be hurled into the stream, I would add one more to the long list of the martyrs of science.

Such, however, was not to be my fate: the bull thought better of it, and took himself away. He had, no doubt, been insulted by a "bull's eye" of yellow calico I had inserted into the tent to furnish me with light; and my friend standing before this he no doubt considered as a sufficient apology. His wrath being thus appeased, he retreated, much to my satisfaction. In commemoration of the event I photographed the place, and have just one copy left, which you can examine. It is nothing in itself, being one of my earliest attempts; but association makes me set some little value on it, poor as it is.

During the few days we spent in this district with our tent, my friend and I took a pretty round number of views; but I came to the conclusion that photographing in such a way was too much a toil to be really a source of pleasure; and when, shortly after, a plan was discovered for employing plates in the dry state, I adopted it, and have been constant to it ever since.

I have worked all the known methods for preparing dry plates, and have altered and improved them to suit myself. That modification which constitutes the main feature of the Fothergill process—I mean the washing off the albumen—I had employed myself in working collodio-albumen long before it was published to the world; and I have now in my possession a photograph taken by it of the *Observatory at Apperley Bridge*, which our Treasurer has seen, and will doubtless remember, now that I recall it to his memory.

It will, I think, be allowed that I have had some little experience in photography generally; and my opinion on the comparative merits of the different processes, founded on this experience, is as follows:—For professional photographers engaged in copying nature out of doors, a van and wet collodion are decidedly the best; for amateurs, the Fothergill process, both for large and small plates, but more especially for the little stereoscopic slides, which, after all, are what will yield most pleasure to an amateur, both for the present and future. Wax paper is very good for reproducing views of old ruins, rustic cottages, &c., where required of extra large size; but I certainly cannot recommend it generally, in consequence of the length of exposure required, and its inability to give any amount of sharpness to views embracing distant objects.

And now it is time I brought this long paper to a close. I have conjured up spirits of the past, and held communion with them for your amusement. I hope, too, my efforts have not been barren of instruction also. It must be borne in mind that the mariner not only requires the compass by which he steers, but that even this would be of little value were it not for lighthouses and landmarks to warn him of rocks, and shoals, and hidden dangers, made all the more terrible because oftenest occurring when he is nearest the land on which he would fain plant his rolling, restless foot. May I hope the sketch I have read to you may answer, in some degree, the purpose of a beacon to some of you, and enable you to avoid what is not of real use in our pleasing art.

Whilst I have been jotting down these recollections, the fire, with its ruddy, cheerful smile, into which I had been gazing, and which had revived up all my old memories, has gradually faded away. The old year has died out with it. As the light expired, a transient gleam would now and then start up, as though the blaze were about to quit its hold, and strove hard to retain it; but these struggles grew weaker and weaker, and less and long frequent, till the last has come and gone, and all is dark. Solemn thoughts crowd round me, and I feel as though the spirits of friends long since dead are hovering near. All is silent without. Not a sound breaks on the ear. The footfalls of the homeless wretch who shivers through the street are as inaudible on the snow-covered pavement as his piteous supplications for warmth and shelter. I rise, and walk slowly to rest; while, as I climb the stairs, I see the space around peopled with the shades of memory, and can almost fancy I hear voices as of childhood's friends whispering to me, as I must to you—"A Happy New Year!"

OBITUARY.—On the 30th ult., at 116, Princes Street, Edinburgh, Miss Anne Taylor, Photographer.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

No. II.

By John Cramb.

I have previously intimated that the 9th of April had been fixed on as the day of my departure. I did actually leave on the morning of the 10th. Permit me to take stock of my luggage as it lies on the railway platform, pounced on by the officials as far exceeding the amount allowed free with a single passenger. "Seven packages, 435 lbs.—313 extra, sir!" shouts the man in green corduroy. The money is paid, and the boxes are safely placed on the top of the carriage in which I am to travel—a condition of things I could have wished I were assured would be possible during my journey. Taking so much luggage along with me proved very troublesome and expensive, without counterbalancing advantages. Indeed, but for the certainty of having anything whenever one wanted it, I should say it would have been quite as safe, much cheaper, and far more convenient to have sent nearly all the boxes by ship to Alexandria, Jaffa, or Beyrout; and by so doing one would have avoided that most horrid of troubles, the customs' examination in passing through France.

London, though upwards of four hundred miles from my home, was reached in less than twelve hours; and I could have wished to have remained a day or two, if but to mark the progress our art was making in that great centre of everything. But, no! I must be in Marseilles on the 13th; so I was reluctantly compelled to set off at once for Paris. Here a trial of my patience awaited me. Travellers who cross the Channel about "the witching hour," and arrive in Paris between nine and ten in the morning, with every qualification for doing justice to a *dejeuner à la fourchette*, are not in the best condition for enduring the tiresome ordeal of a custom-house examination. I had imagined that, as I was going direct through France, there would be some arrangement by which my luggage could be sent under seal direct to Marseilles, in the same way as it is from London to Paris. No! The Chemin de Fer du Nord has no connexion with the Chemin de Fer de Lyon à la Mediterranée. To come to the point. I was politely—a Frenchman does everything politely, not kindly or civilly, though—I was politely informed I must open every package, and turn out on a railway platform every part of their fragile and, to me, very valuable contents. The reader may guess how it shocked my nervous system to think of undoing my carefully-packed parcels of albumenised glass in such circumstances. Perhaps a less stringent survey might have satisfied; but, on opening the boxes that contained my stock of glasses, the sight of one box within another seemed to the lynx-eyed officers to speak of deception and promise a capture. I took especial care to inform the officers of the Douane what was in every box before opening it, and by so doing anticipated saving myself the pain of seeing them "pawing" my prepared glasses one by one. All explanation, straightforwardness, and sincerity were quite lost; and the amount of labour to themselves alone saved me from having my preparation of the glasses all destroyed, and from everything being turned out of its place and then hastily packed, risking the breaking of the whole of the fragile contents of my boxes. After an hour and a-half of examination the boxes were closed, and in another hour I was informed I would have to pay duty on the glass, but that I could recover that at Marseilles on embarking my goods on board the steamer. There is a new difficulty. Is this plain glass? If not, what is its value? Right glad was I to be told I must pay seventy-two francs, and that having paid which I and my traps might go wherever I felt disposed. I had entered Paris before with my camera and other photographic paraphernalia, and found no difficulty or annoyance. Probably this time the more imposing appearance of my baggage had excited the cupidity of the executive at the Douane.

I was in Paris—I was going to say the birthplace of photography—*one* of them would be more correct. I took a stroll along the Boulevards, not interested in the gay, giddy crowd that flooded along, but absorbed in their miniature shadows on the wall. The Parisian photographer had not begun to show the life size, and as much longer as you like, which seems to be "the thing" now. Nothing remarkable was to be seen. Le Gray—who had often astonished and instructed the photographic world, and who two years ago had set the art-world in raptures with his "sea and sky," and by it had done more to win for photography a position in the estimation of Fine-Art critics and collectors than even the most sanguine lover of our enchanting art could have hoped for—had left Paris, and his princely establishment was advertised to come under the auctioneer's hammer. I remarked again, as I had done before, how little progress the Parisians seemed to make in glass positives—nothing like what one could see in any large town on this side the Channel. Well, perhaps they judge rightly: they are not the most creditable productions of our art, even at their best.

Of Lyons and Marseilles I would like to have said something regarding photography, but will reserve it till my return. The reader is probably by this time wearied of introduction, and desires to set foot with me on the Holy Land as soon as possible.

Malta should be reached from Marseilles in about three days. I was fully five days before I sighted the welcome harbour of Valetta.

The crazy, worn-out screw steamer the "Hydaspe," and its pluckless crew of uniformed automata as officers, and half-starved-like lubbers for sailors, were quite unequal to the task of going forward with a heavy sea and head-wind; so, after being almost within sight of Malta, we put about and ran for Sicily, and I had a look at a part of the dominions of his brimstone majesty of Naples. Rugged and precipitous enough the shores looked.

I landed at Malta, and resolved to remain there a few days to confirm my health before going farther, and did a little in photography as well. What followed I give almost *verbatim* from my journal written at the time.

I am at Malta, or more precisely I am in Valetta, the chief city and port of Malta and its dependencies. There are two principal islands, Malta and Gozo. Malta, the eastern and much the larger of the two, is about sixty miles in circumference, about twenty miles at its greatest length, and twelve miles at its greatest breadth. The island may be said to be one large limestone rock, and pretty nearly a bare one; for, in travelling over its surface, one sees so much of the uncovered rock, and so little of green fields and trees, that its rocky character makes an early and decided impression on the mind. There are one or two fertile plains of a few miles in extent—as the plain of Nasciar, immediately to the east and south of the bay, which tradition and biblical scholars of nearly every country have fixed as the place of St. Paul's shipwreck. These islands are very densely peopled—eight times as much so as England, there being 100,000 souls in Malta, Gozo, &c. There may be said to be one continuous town over the whole of the island of Malta. The city of Valetta is surrounded with a circle of eight or ten smaller towns: we just clear one when another begins. Citta Vecchia, or the old city—Citta Notable it used to be called—was the capital of Malta till the government fell into the hands of the Knights of St. John of Jerusalem. It is now, like most cities which have been "superseded," a quiet, dull-like place, seeming to exist only for the purpose of being shown to strangers. It stands entirely on very high ground; and, being in nearly the centre of the island, from any part of it, and especially from the roofs of the higher buildings—such as the cathedral and one of the convents—a fine view is obtained of "Malta and its dependencies." Everywhere over these islands places associated with the shipwreck and residence of St. Paul are shown. Citta Vecchia, as the capital, could not be behind. There is a church specially dedicated to the Apostle of the Gentiles, and under it a cave, in which the visitor is informed St. Paul lived for three months *per penitentia*. There is nothing very marked about it—a goodly size of place it is now; and we were assured it never gets any larger, though yearly cart-loads of the stone are carried away by tourists. Another sight of at least equal interest was the catacombs. Very wonderful excavations they certainly were; but whether they were for the living or the dead, or if of Phœnician origin or not, I am not able to tell with certainty; so I had better leave them with the many learned doctors who, in this matter, have gone before me in every sense of the word. Malta is thoroughly Roman Catholic; and here, as in all countries where the religion of Rome prevails, the churches are of great extent and magnificence. In one small village, or *casal*, as they are called, amid a squalid people and poverty-stricken dwellings, rises a dome which, for size and beauty, bears favourable comparison with the famous domes of the world. The village of Mosta has a church which in anything could be compared with the great works of Michael Angelo and Sir Christopher Wren. Strange to say, the architect of this wonderful building is a Maltese, a poor man, residing, if not born, in the *casal* of Mosta. How, you will ask, can so much magnificence be afforded? The tale we were told was this:—The architect conceived the plan; a parish priest took it up, and left his fortune—a goodly sum—to begin the work, and organised the plan of getting the rest done. The villagers would not give money, nor, indeed, anything else. But their time on Sundays and the many feast-days was the Church's, and that they gave. The church has been built on Sundays, and all with free labour. Well, their reasoning was not so bad, for they worked for God on the Lord's-day. Except a fine portico and a recess in

which the altar is placed, the church is a duomo or circular building, surmounted by a dome. I do not know the size exactly: I think about a hundred and eighty feet in diameter, and of very great height. When one enters, the feeling of the sublime is great, though, being yet unfinished, the effect is considerably impaired. Yes, not finished; and it has been already thirty years in building!

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of the above Society was held on Tuesday evening, the 8th inst., at eight o'clock, at King's College,—John Crace, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman announced that the Council had nominated Mr. Vernon Heath and M. Joubert as auditors. He had also to propose the following gentlemen for election, as members of the Society:—M. Antoine Claudet (one of the oldest, if not *the* oldest, photographer in this country), Thomas Gillis, Esq., and Captain Verschoyle.

These gentlemen, having been ballotted for, were declared duly elected.

Dr. Diamond exhibited a specimen, sent by Mr. Leighton, photographed from one of his negatives, and engraved upon wood by Mr. Thomas Bolton, and read a letter from Mr. Leighton upon the subject.

The Chairman stated that the print was published in the *Lyra Germanica*, and it had been noticed in the *Illustrated London News* of the previous week. The positive impression was printed on, or transferred to, the wood block, which was then placed in the engraver's hands.

Mr. De la Rue, in referring to Mr. Leighton's method of transferring photographs to wood blocks for the purpose of engraving, observed that it was necessary in these cases to pay great attention to dates, so that each person who had contributed to the discovery should receive the credit due to them respectively. In September last his esteemed friend, M. Joubert, transferred the same, or a similar subject, to a wood block. Having seen that block, he thought it only right to mention the fact, so that M. Joubert might receive any credit to which he was entitled.

Mr. Henry Bohn observed that in Jackson's *History of Wood Engraving*, which he was just about to publish, this block was referred to as being taken from a negative of Mr. Leighton's, and engraved by Mr. Thomas Bolton. He was not aware until now that M. Joubert had transferred the photograph to the wood, but it was only right that such a fact should be stated.

M. Joubert said Mr. Leighton had called upon him in August or September last, to inquire whether his phototype process could be applied to wood, as well as to paper and porcelain. He told Mr. Leighton that it could be so applied. That gentleman then sent him some negatives, which he transferred to the identical block (he believed) now before the members; if not, Mr. Leighton must have copied it upon another block, but it looked very like the one he had executed.

The Chairman observed that the work having been published a month ago, September would have been the latest time that M. Joubert's invention could have been carried out, so as to allow of the block being inserted in its pages.

M. Joubert remarked that he had in his possession a similar block, executed by his phototype process two years ago.

Dr. Diamond was aware that Mr. Archer had, in 1851, succeeded in transferring the collodion film to a wood block by floating it, from which some very rude woodcuts had been executed.

M. Joubert stated that Mr. Archer found the collodion film prevented the workman from executing the woodcut with sufficient delicacy. In the phototype process, however, there was not that objection.

The Chairman asked whether M. Joubert could explain the process?

M. Joubert said he had not made the process public. The invention was not yet in such a practical form as to allow of an ordinary workman carrying it through the several stages. As soon as he had reduced the manipulative details to such simple practical operations that any one could follow, he should then make his process public.

Mr. Malone mentioned that Mr. Crookes had published a method of transferring photographs to wood blocks, in which oxalate of silver was employed. If all that was required at present was the power of transferring by printing inks the impression to wood, he might mention the process of M. Fizeau for etching on daguerreotype plates. M. Claudet had given them a portrait of himself obtained by that method, which was known in 1844 or 1845; and, so far as mere faint, delicate outline etching was considered, it was extremely beautiful.

Dr. Diamond then read a letter from Mr. Hautrive, referring to Mr. Thomas's paper on varnishing negatives (read at the last meeting), and also a letter from Colonel Phipps, stating that the Queen being in the country rendered it impossible for either Her Majesty or the Prince Consort to inspect the Photographic Exhibition as on former occasions; but that during the time it was open they would not fail to attend for the purpose of examining the photographs exhibited. (Applause.)

Mr. Vernon Heath rose to make some animadversions on a statement made in an advertisement respecting Mr. Dallmeyer's triplet lens, printed on the cover of the Society's Journal, in connexion with a letter inserted in the Journal; but, after proceeding for some minutes, the chairman stopped the speaker, as he thought the subject irrelevant to the business of the evening, and he considered it would be better if Mr. Heath gave notice of his intention of bringing the matter before the Society on some future occasion.

Mr. Malone thought that Mr. Heath's remarks were open to a serious objection. If every ambiguity in every paper or advertisement was open to discussion, there would be no end to it; nor would the Society gain credit by such discussions. If necessary, he would move that this mode of trespassing on time that should be devoted to the legitimate subject of the evening should not be allowed.

Mr. Heath then gave notice that he should bring the matter forward at the next meeting.

Mr. Fry read a paper *On Lunar Photography* [see page 24], and exhibited several illustrative photographs.

Mr. Warren De la Rue had listened with very great interest to the remarks of Mr. Fry, who had evidently been pursuing with assiduity his experiments on lunar photography. If they had a dozen observatories, each as well served as the one at Brighton, the field was sufficiently large to employ them to advantage. His practice, as was natural among individual experimenters, differed somewhat from that of Mr. Fry; but it was merely a question of experience, as each person worked best with the chemicals he was accustomed to. First of all he (Mr. De la Rue) found great advantage from using fused nitrate of silver for the bath, for it was the most manageable, as he had mentioned in his paper *On Celestial Photography*, published in the Reports of the British Association.* To secure its purity and freedom from nitrite or organic matter he personally took out, with a porcelain bowl, crystals direct from the evaporating basins of the manufacturer, so as to ensure the sample being preserved from contact with paper, and thus being contaminated with organic matter. He subsequently fused the nitrate of silver thus obtained in small quantities (about a drachm) at a time, taking care not to raise the sample to such a temperature as to produce nitrite of silver. He then put the sample into a bottle, taking care not to handle it or bring it into contact with any contaminating body. The bath prepared from nitrate of silver, thus carefully obtained, in the first instance gave one or two foggy pictures, but after that all went well. As a developer, he used aceto-pyrogallic solution, which he considered to be the best for the purpose. He had also used citric acid, which he found gave very dense negatives, but they were deficient in that transparency so necessary for taking copies of pictures of the moon. He always *over*-exposed so much that the whole picture began to develop immediately on the solution being poured on. The bright parts of the moon then came out quite dark. He used the ordinary negative collodion. He had tried Hardwich's, Thomas's, and other collodions, but he preferred collodion iodised with cadmium to that with any other iodiser, as it was necessary to have an iodised collodion that would retain its sensitive properties for a long time. Through frequent atmospheric disturbances they could not calculate upon any given night being suitable for celestial photography, therefore it was better to employ a cadmium iodised collodion, which was always ready for use, to a collodion iodised with iodide of potassium, which soon lost the requisite sensibility. Thus, whenever a fine night did occur, they were always in a position to commence operations. With regard to the telescope employed by Mr. Fry, it was not specially corrected for the actinic rays; so that the visual and chemical foci not being coincident, every one of the points of light acting on the film were surrounded by other rays, and this tended to mar the sharpness of the negative. It was essential that every achromatic telescope used for celestial photography be specially corrected for the purpose. There was another subject to which he would refer, namely, the driving clock. The most equable machine they could produce sometimes broke down when they were measuring their skill against the superior equable motion of the earth. Now and then a star would adhere to the wire immovably, and then it would lean a little to the right or left. It was very difficult to get true sideral time, but still more so to obtain that of the moon, which, as Mr. Fry had told them, was always going at a varying speed in an adverse direction to that of the heavenly bodies. Although they might adjust the clock one night to follow the moon, it would not do so the following night, or, indeed, an hour after the time for which it was set. For this purpose special appliances were necessary, and always kept in working order. So delicate were the adjustments that he had calculated that a small particle of dust on the adjusting screw was sufficient to disturb the adjustments to such an extent as to make itself perceptible in the photographic image by damaging results. For taking photographs of the moon, &c., they must also bear in mind, whilst the average focal length of photographic lenses was one foot, that of astronomical telescopes was ten feet. Consequently they must not expect to find the same amount of sharpness as in ordinary negatives. Mr. De la Rue then exhibited several very fine transparent photographs of the moon, fixed stars, and planets; and pointed out the means of obtaining stereoscopic views of the moon, by taking advantage of the moon's libration, and the errors that would arise through the improper adjustment of the pictures obtained, the details of which will be found in Mr. De la Rue's articles *On Celestial Photography* (given in our volume for 1860); and he concluded by promising to bring before the Society, on some future evening, his experiences in solar photography, more especially in reference to the late expedition to Spain for making observations on the eclipse.

* See No. 122 of The British Journal of Photography for July 16th, 1860.

Mr. Shadbolt wished to ask Mr. Fry a question. Mr. Fry stated in his paper that he enlarged by a double operation. Had he ever tried to enlarge by first *reducing* the picture in size, and, having produced a smaller transmitted positive, enlarging this to obtain the negative of the desired size?

Mr. De la Rue had always obtained his positives of the required size directly from his negative.

Mr. Fry was glad that his paper had elicited so much valuable information from Mr. De la Rue. That gentleman had stated that the instrument he employed possessed incalculable advantage over the Brighton telescope, and this accounted for the larger and sharper images that gentleman had been able to produce. He fully agreed with Mr. De la Rue upon the care necessary to be taken with respect to the libration of the moon, when taking stereoscopic views of the same. In answer to Mr. Shadbolt, he must say that he thought he had tried every way of enlarging, but it had certainly not occurred to him to enlarge by the method suggested by that gentleman, However, he did not quite see how that method could produce a sharper picture.

Mr. De la Rue said there was just one point, as a matter of scientific speculation, mentioned by Mr. Fry, to which he wished to refer. That gentleman stated that he found his pictures differ in sharpness on different nights, and attributed it to the varying distance of the moon from the earth. Now, he (Mr. De la Rue) thought such difference might be owing to the varying length of the tube of the telescope in different temperatures, as he should think the varying distance of the moon was so slight as to make no difference in a picture.

Mr. Hardwich said he had lately been on a visit to a friend at Cambridge, when he paid a visit to the observatory of Professor Challis, for the purpose of obtaining photographs of the spots on the sun, having had no experience of the chemicals necessary to be employed in so strong a light, but knowing he should have to contend against its over-action, he had used a bromo-iodised collodion. With this he used a forty-grain nitrate of silver bath, as he found this strength acted better than one of thirty grains with a collodion of this nature. Considering sulphate of iron too strong for a developer, he had used one grain of pyrogallic acid to an ounce of water. That developer would not, of course, be sufficiently strong under ordinary circumstances, but it was well adapted for such a subject. The spots were not perfectly sharp, but that was owing to the fact that they were in continual movement owing to an atmospherical effect. He was confident that the use of a bromo-iodised collodion, with a forty-grain bath and a weak developer, was of great value in taking such pictures. They reduced the aperture of the telescope by means of stops of brown paper. He also found a halo round the sun in the pictures he then obtained, similar to those recently alluded to in the Photographic Journals; but this was quite different from any other halo-like effect or defect that had previously come under his experience. He had heard this kind of effect attributed to faulty mounting or a defect in the lens; but he thought it was attributable to some other cause. With regard to Mr. De la Rue's observations on nitrate of silver, and the organic matter with which it was too frequently contaminated, he had lately drawn attention to the subject, and it was an important one. It had been asked—How does it get impregnated with organic matter? But when they considered how the nitric acid was exposed to contamination by the luting of the retorts in which it was distilled, and the linseed-meal placed round the necks of the carboys in which it was stored, it was not difficult to answer such a question; but, till they were in a position to obtain nitrate of silver free from organic matter, he feared that fusing the salt would only lead to endless cases of fogging. He was quite convinced that pure nitrate of silver would bear fusing, and that there was little fear of nitrite being formed unless an unnecessarily high temperature were employed in the operation.

Mr. Sebastian Davis said he had recently been experimenting to ascertain whether any advantage could be obtained by modifying the composition of the developing fluid, so as more satisfactorily to photograph objects strongly illuminated by direct solar light. It would have been noticed that Mr. Fry recommended the employment of protosulphate of iron, whereas Mr. Warren De la Rue advised the usual pyrogallic acid developer. The solution of the protosulphate of iron possesses the property of bringing out the portions of a picture cast into deep shade with a minimum of exposure, but at the same time yielding insufficient intensity properly to represent objects in bright sunshine. Pyrogallic acid solution, on the other hand, fully accomplished the latter purpose, but acted with comparative feebleness in rendering the parts of a picture impressed by weak radiations. It therefore suggested itself to his mind, that if by chemical means he could prevent the formation and precipitation of pyrogallate of iron, and could mix the two developing agents together, he could produce improved results. Upon adding a simple solution of pyrogallic acid to one of protosulphate of iron, a deep blue mixture occurred, and, if persulphate were likewise present, a black precipitate of the pyrogallate of the peroxide of iron. He found, however, that if he slightly acidified the solution with a strong mineral acid, such as the sulphuric, then no blue discolouration or precipitation ensued, and the mixture remained without deterioration for a considerable time. The photographic advantage accompanying the employment of a developing agent containing both pyrogallic acid and protosulphate of iron, as suggested, consisted in the increased facility it afforded towards obtaining with a short exposure proper definition in the parts in deep shadow, together with sufficient intensity in those portions brilliantly illuminated by direct sunlight.

During the evening the Secretary called attention to a plate-warmer invented by Mr. Gutch [see page 21], and two forms of instantaneous shutters invented by Mr. Dallmeyer, to be employed with a pair of his stereoscopic lenses.

Mr. Sebastian Davis proposed, and M. Joubert seconded, a vote of thanks to Mr. Fry and Mr. De la Rue for their valuable communications.

The thanks of the meeting were then voted to those gentlemen amid great applause.

The proceedings terminated with the usual vote of thanks to the chairman.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

Not having had an opportunity of seeing any proof of the report of the last meeting of this Society, owing to the necessity of "going to press" on a given day, we regret to find that one or two errors have occurred. The only one, however, which requires special correction, is a statement attributed to the Chairman, as follows:—"If the bromide were present it would unite with the iodide salt and form an insoluble substance; but if they used iodide only it washed out, and a good negative would not be obtained."

We have the best authority for asserting that no such absurd remark was made. The report should have run thus:—"If a bromide were present, as well as an iodide of silver, it would account for the ready formation of an image, notwithstanding very copious washing of the film; because, the bromide of silver being a salt capable of reduction by the action of light alone, all the conditions to the formation of a visible image would be present, and the same would be the case if a citrate or phosphate were substituted for the bromide. But if the collodion were sensitised with an iodide *alone*, and all the free nitrate of silver washed away, it would be very difficult to obtain an impression, from the absence of the reducible salt of silver."

MANCHESTER PHOTOGRAPHIC SOCIETY.

A Meeting of the above Society was held in the rooms of the Literary and Philosophical Society, 36, George-street, on Wednesday last, the 9th instant,—Edward Mann, Esq., in the chair.

The Secretary announced that a number of prints, upon paper and glass, were now ready for exchange under the rules adopted at the last meeting, and might be inspected by the members after the general business of the evening had been transacted.

Mr. Pyne exhibited several negatives taken by Mr. Sutton, of Jersey, upon plates prepared by Dr. Hill Norris. The time of exposure was stated to be the same as that required for wet collodion. As an account of the testing of these pictures had appeared in Mr. Sutton's publication, he referred the members to it for the particulars.

The Secretary said it would be recollected that he had at a previous meeting developed a negative taken on one of Dr. Norris's sensitive plates, and had upon the same occasion shown others which he had developed at home. The exposure in his practice had been equally short with that mentioned by Mr. Sutton; but the results had been unsatisfactory in reference to brilliancy of effect, and others had experienced the same disappointment. The negatives now exhibited had been taken upon plates prepared after this defect had been spoken of, and he was most happy to find that they possessed qualities far superior to those which his experiments had afforded. He particularly called attention to two of them, which he believed were perfectly satisfactory, and he considered that they bore substantial evidence of one of the greatest improvements in photography having been effected.

The remainder of the evening was taken up by the exhibition of transparent pictures upon the screen by the oxycalcium light, which was kindly furnished and superintended by Mr. Dancer.

A vote of thanks to Mr. Dancer, to those who had provided pictures, and to the Chairman, closed the proceedings.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A General meeting of this Society was held on Tuesday, December 18, 1860,—C. L. Haines, Esq., Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed,

Mr. Burr, of Ladywood Lane, was nominated as an ordinary member of the Society. Mr. J. V. Jones was duly elected a member.

In accordance with Rule 16, a ballot was taken for the removal of the names of Messrs. J. C. Phillips, J. O. C. Phillips, J. H. Hawkes, and — Branthwaite from the Society, in consequence of their non-compliance with the requirements of the Council.

The Chairman then called upon O. G. Rejlander, Esq., of Wolverhampton, to read his paper, entitled *The Camera of Horrors; or Failures in the Wet Process.* [See page 29.]

On the conclusion of the address an interesting discussion followed.

Mr. W. B. Osborn, Vice-President, thought that it was possible to use a larger amount of light than photographers would generally admit; but that, as a substitute for yellow glass, he had found paper of a lemon-yellow tint and proper texture exceedingly valuable—*one* sheet in thickness

being sufficient for all general purposes, but *two* would effectually prevent any evil effects; and, while admitting sufficient light to render the operating-room pleasant, entirely shut out the chemical properties of the rays. As to the scum upon the bath, he thought it either arose from a peculiar kind of collodion, or from an admixture of collodion with the bath, and was the cause of much unpleasantness to those who used it.

Dr. ANTHONY, as an old photographer, complimented the Birmingham Photographic Society on having such a practitioner as Mr. Rejlander on the list of its members. He had listened to the remarks of that gentleman with a vast amount of pleasure, both on account of their practical bearing, and because he could not forget the fact that Mr. Rejlander had done more than any other man in England in rescuing photography from the purely commercial position it had a tendency to assume, and placing it in its present one as an art. While in Syria and the East he had had a large experience in external developing, it being necessary there not only to *coat* the plate but to *expose* it in a yellow light. In his own operating room the best light he could find was that of a moderator lamp, with the globe coated internally with vermilion. As to the surface scum upon the bath, he (Dr. Anthony) had never met with it in "glass" or "porcelain," but only in "gutta percha;" and he wished to ask Mr. Rejlander how often a bath should be filtered?

Mr. REJLANDER said that when a bath caused marbling upon the surface, &c., the cheapest and best way was to dispose of it and obtain a new one.

Dr. ANTHONY observed that many of the best authorities filter every night. The *moire antique* markings Mr. Rejlander complained of were to be attributed to the cloth with which the glasses were cleaned being damp, and on rubbing the plate a series of markings were produced; but these might be dispersed by rubbing in a circular manner. That cleanliness was the chief means towards obtaining a good photograph was sufficiently proved, the plates being marked from superposition; but on no account should *paper* or *grease* be allowed near the plate; and for the purpose of removing an old film, if requisite to be placed in water at all, he should recommend its being placed perpendicularly in the best rain water. The precipitate on the plate arose from soaking in water containing *salts*, which, when impasted, there was a difficulty to remove. Glass containing lead and silicate of potash, silicic acid being joined, had a better affinity for the soda, and thus the glass became partially honeycombed. All photographers had met with the dust marks, and he himself had experienced considerable annoyance from that source while in Egypt. To prevent that annoyance he had the sand under the operating tent, and also a carpet upon the sand, watered, the inside as well as outside of the camera sponged, and over and above this he had a damp cloth laid inside. The hard crust from the collodion bottle neck was easily overcome by cleaning the neck on each occasion before proceeding to coat the next plate. Scratches and markings upon the negative and upon the plate before coating were often produced by silk handkerchiefs, which, containing animal matter, being rubbed upon the plate produced a series of markings in the negative. Cracking in the varnish arose from damp and the difference of expansion between the glass and collodion. Coloured sheet glass was hygrometric to a great extent, causing gaps in the collodion, thus allowing the surface to be seen through the collodion and varnish, &c. These film cracks could be removed in a great measure by holding the plate for a few seconds before a fire before beginning to varnish. But even when that precaution had been taken, placing the plate upon a damp shelf, or against a damp substance, would cause them. The fogging, he thought, was to be attributed to the reflection caused by the light falling at a particular angle upon a common lens. He would eschew folding cameras of all kinds as not being light-proof, particularly in the East, where it was essential to use even a common camera in a yellow bag.

Mr. REJLANDER said that the wooden grooves in which the glasses were placed until there was time to varnish, or to dry before doing so, acted very detrimentally upon the edges of the coated plate; and if partially dry, and a dry film were placed opposite, the dry one was not only affected by the box itself, but more seriously so by the presence of the damp one.

Owing to the lateness of the hour, it was resolved to adjourn the discussion until the 29th of January, when the attendance of the numerous visitors present at the meeting was again invited.

On the motion of Mr. OSBORN, seconded by Mr. J. T. BROWN, Jun., a cordial vote of thanks was unanimously given to Mr. Rejlander, and that gentleman having briefly replied, the meeting adjourned.

BRADFORD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of the Society was held on Wednesday evening, the 2nd instant, at eight o'clock, at the rooms, Chapel Houses, James Street,—Dr. R. Parkinson, the President, in the chair.

The minutes of the last meeting having been read and confirmed, the PRESIDENT moved that early arrangements should be made for the circulation of the Journals amongst the members, and proposed that a special meeting should be held for that purpose, which was seconded by Mr. LEATHER, and carried.

Mr. CHARLES BUTTERFIELD then read a paper, entitled *A Photographic Retrospect.* [See page 30.]

At its conclusion, a vote of thanks was proposed to Mr. Butterfield by Mr. LEATHER, seconded by Mr. STANLEY, and carried by acclamation.

A vote of thanks was also given to Mr. J. McLandsborough for presenting to the Society's library a number of photographic books.

Mr. LEATHER laid before the members a number of very fine photographs, illustrative of the wet and dry processes, and several well-defined prints from waxed-paper negatives, after which the meeting adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this Society was held in George Street Hall, Edinburgh, on the evening of Tuesday, the 8th instant. The President, Sir David Brewster, being unavoidably absent from slight indisposition, the chair was occupied by Alexander Young Herries, Esq., jun., of Spottes.

After the minutes had been read, the CHAIRMAN presented Mr. C. G. H. Kinnear, the late Secretary, with a silver medal, in acknowledgment of his valuable services while Secretary of the Society, and also for his invention of the portable camera which now bears his name.

Mr. KINNEAR having returned thanks, Mr. Auchie was elected a member.

Mr. T. B. JOHNSTONE read a short communication detailing his experience in working the malt process. It differed in no important respects from that of Mr. Walker, as published in this Journal a month ago among the transactions of this Society. He said, however, that everything in this process depended on the preparation of the malt solution, and the using it at the proper time after preparation. He found the best proportions to be twenty of water to three of malt. In its preparation he heated the water to 175° Fah., and then added the malt, stirring well while doing so. It was then cooled gradually.

Mr. J. T. TAYLOR read a paper *On Silver and some of its Salts.* [See page 26.] This paper was illustrated by a few experiments. No discussion followed these two communications.

The Hon. Mr. Fox Talbot was expected to have been at the meeting; but a letter was read expressing his regret at being unable to be present on that occasion. He, however, sent a great number of specimens of his patent photoglyphic engravings, which were handed round among the members, and which, from their extreme minuteness of detail and fine gradation of tone, were greatly admired.

Thanks were voted to Mr. Fox Talbot, and the meeting then separated.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

ON Wednesday evening last, the 9th instant, the first annual *soirée* and *conversazione* of this Society took place in St. Mary's Hall, Renfield Street.

J. Kibble, Esq., President, occupied the chair, supported by Dr. Taylor, of the Andersonian University, Alexander Macnab, Esq., John Stuart, Esq., J. Spencer, Jun., Esq., A. Robertson, Esq., &c.

The Hall was crowded to excess—not fewer than 200 ladies and gentlemen having been present. Suspended from the walls were various triumphs of the photographic art, contributed by the members; and in an ante-room were to be seen Mr. Kibble's two views of *The Broomielaw*—one of them being the largest "direct" picture on record, and both seen to great effect by means of cosmoramic assistance.

After tea, the Chairman, Mr. KIBBLE, rose, amid great applause, and delivered the following address:—

On the Light we Use.

I FEEL highly gratified in having the honour of addressing the present assembly, constituting the first *soirée* held in connexion with photography in this city. It is not my intention to encroach on your time by entering into the minutiæ of the science; still, a little may be said on so interesting a subject, which may not only amuse but be highly beneficial.

The object of this Society, as the name partially indicates, is to inform itself as much as possible, by studying, practically and otherwise, all the various changes effected by light on organic and inorganic matter, more particularly when in contact with metallic salts—such as the darkening which takes place when nitrate of silver, in solution, is spread upon paper, under the influence of sunlight. In light we have a space-penetrating messenger, darting with a velocity of not less than 12,000,000 of miles for every minute of time; informing us of worlds so distant that even the highest optical power gives but a faint intimation of their existence. How unfathomable to the human mind that a substance traversing space with such inconceivable velocity—dashing through the surface, and striking upon the retina of that most delicate of all organs, the eye—should be unfelt, indeed unknown to us, in so far as actual sense is concerned—its presence only being made manifest by the visibility of surrounding objects! Until a comparatively recent date, light was considered an elementary substance; but recent investigation has proved it to be composed of not less than three distinct properties: viz., calorifiant rays, which give heat; colorifiant, which impart colour; actinic rays, which excite chemical change, and which last is the property the photographer has chiefly been experimenting with.

Although there are several (who confine themselves exclusively to a still higher branch of the sciences) who have been endeavouring to obtain a coloured image coinciding with that depicted on the focussing screen of the camera, the most sanguine hopes are entertained that such a result will be effected, and rendered as permanent as the generality of pictorial productions are. The wonderful discoveries of the present age justly warrant the highest hope of the future. So as to bring clearly within the comprehension of those of my auditors who have not given any attention to such matters, it will be necessary to enter into a slight explanation or proof of the assertions made regarding the properties of light, but which, from limited time, and the nature of this meeting, must be very superficial indeed.

In the first place, as to colour. By closing the shutters of any room so as to exclude light, afterwards piercing one of the panels with a small borer, so

as to permit a ray of light to enter, it will proceed in a straight line parallel to the aperture by which it enters, and so continue its course until interrupted. By placing a prism, such as you now observe, so as to intercept its passage, it will pass through it; but instead of emerging from it, as previously seen, it suffers decomposition, and, if received upon a light surface, exhibits what is termed the prismatic spectrum—all the colours of which light is composed being clearly visible. These, according to Sir D. Brewster, are red, yellow, and blue; but, at the extreme side of each colour, where they are supposed to overlap each other, the intermediate tints are produced, blending imperceptibly into each other, such as you observe in the rainbow's lovely form, which is produced by the decomposition of light in passing through small particles of water floating in, or falling through, the air. A very satisfactory illustration of this can be had at any time during sunshine, by observing the foam from the paddle-wings of a steamer, which you will generally find accompanied by its satellite rainbow.

Now, as to heat. By holding a thermometer in the different colours of the spectrum, the degrees of heat will be indicated—red the greatest number of degrees, yellow next, and blue the last. Again, glasses can be so prepared that the chemical rays can be excluded, whilst the light passes through freely; also, so that light can be shut out, and heat passing through freely; again, so that light can be greatly excluded, the chemical rays passing through.

There are several effects of light with which all of my fair auditors must be familiar, but which, in all probability, have ended in simple observation, such as the bleaching of their linen, sleeves, collars, and other ornamental fabrics with which they so much delight in adorning themselves. This bleaching all of you know is effected by spreading the articles out to the action of the sun's rays, or even diffused light—the brighter the better—watering them as often as they become dry, the result being a brilliant white instead of that dull, unwashed-looking tone they possessed previously. Now, this much-desired change is effected by a chemical action induced by light, the carbonaceous matter of the cloth combining with the oxygen of the air, forming carbonic acid, which immediately commingles with the surrounding atmosphere, forming food for the vegetable world—in short, sad to say, is so much of the "little love of a collar" gone for ever. Let any one who doubts this expose to the continuous action of the summer sun a fabric which has not been worn, watering it constantly when dry. I feel safe in saying that by the end of the season it will weigh one-fourth less than what it did at first, and go to pieces in the hand with a very slight tension. This hint may be useful. I have known many who, not satisfied with a fabric having attained the maximum whiteness, continued the bleaching process, under the impression that they could not get too much of a good thing.

Horticulturists for a considerable period have been acquainted with the process of growing several succulent plants almost colourless, such as celery, sea kale, &c., &c., which is effected by enclosing the plants in large earthen vessels, boring holes in the top, which are covered by moveable lids, which, when closed, shuts out almost all light from the plants, and at the same time admits sufficient air for growth. That excluding sunlight from the plants was the cause of their growing colourless they had not any doubt, but *why* such should be the case they could not answer—sufficient for their purpose that it was so. Indeed, several nurserymen with whom I have conversed recently, seem never to have given a thought to the subject, or inquired why it is that plants deprived of light grow colourless. This arises from the fact that colour is not an inherent property of matter, but derived by decomposition from light; so that if earth be heaped upon the plants as often as they emerge from the soil, or grown in an almost dark chamber, they must of necessity grow colourless, the only source from which it could be obtained being excluded.

The destructive influence of light in altering the colour of cotton, woollen, and silk fabrics, is familiar to all of you; still more so the tendency to impart that undesirable yellow tint to the skin which the fair sex dread to such an extent that, rather than have the purity of their complexions hurt, they willingly suffer their faces to be parboiled, and submit to partial suffocation by enveloping their faces in thick veils during the intense heat of summer, and, "*unkindest cut of all*," deprive the opposite sex of one of the most delightful of all emotions—that consequent on the sight of beauty.

To save time, a few examples of the action of light may be clustered. Several vegetables which are eaten as luxuries, when blanched, are poisonous when grown in open daylight. Flowers turn to the light. Flowers under a glass shade, through which the sun's rays are allowed to pass, deposit dew first on that side of the glass towards the sun. All woods, with few exceptions, darken in the sun's rays. Gases which can be mixed in a glass receiver without alteration, combine instantaneously in sunlight with explosion. Cut a small branch from a tree, and it will be found that wood has grown to a greater extent in the direction of the greatest light. Some substances which are soluble under certain circumstances, become insoluble after a few hours' exposure to sunlight. In short, the changes effected by light are endless.

Had we been informed just sixty years ago by some intelligence that, ere the nineteenth century had completed half its course, the ever-restless being, man, dissatisfied with the conquests he had already gained over the material world, would get within his grasp the influence of a body resident from the earth, on which he moved, not less than 95,000,000 of miles; making it, through the aid of chemistry and optics, subservient to his use in the delineation of Portraiture, not only of mortals like himself, but of the moon and stellar worlds; also of objects so infinitesimal that the microscope only could render them visible—I repeat, had such information been given sixty years ago, would not the listener, like Sarah of old, have laughed her informer to scorn? Yet all this has *been* done in a science but yet in its infancy.

Consider the delightful emotions we enjoy through the agency of light, independent of its property of rendering objects visible. Who has not felt almost sublimed as he gazed on the variegated tints of our own Scottish hills, sweeping upward for some thousand feet above the level of the sea—light and shadow from intervening clouds chasing each other in rapid succession along their bumpy sides? Who has not felt his love of the beautiful called into exercise as his eye swept over waving forests of deep green foliage, here and there relieved by the orange hues of autumn, and at intervals by chasms, down which the mountain torrents sweep their resistless force—the foaming waters shimmering in the sunlight, whilst the spray, rising from the thundering waterfall, is surmounted by a mimic rainbow—that most beautiful of objects—whose glowing colours, vanishing into each other, must have excited man's admiration ever since the flood? Or gaze we on the pastures which fringe our rock-bound coast, efflorescent with all that is bright and beautiful in the floral world; the soft velvet sward over which we so joyously tread—on which the eye so loves to repose—gemmed with beds of colour so radiant that the sense of sight becomes bewildered? Yet in midst of all this galaxy of loveliness, how few have asked—Whence come you?

Mechanics has long since established the principle that action and reaction are equal; hence, a ray of light falling upon any solid body is reacted upon by that body, and sent into space, carrying with it an image of itself, bounding and rebounding throughout creation, and although lost to our finite senses, will go on throughout infinity, impressing the whole material creation with an action never to be effaced. No matter how many wavelets or pulsations may intersect each other, there will be no destruction of the original influence—like the disturbance created by two bodies plunged at short intervals from each other in the placid water, the circular waves resulting therefrom will intersect each other and, from an apparent confusion, emerge as perfect in form as if no interference had been offered. To use the glowing language of Professor Babbage, when speaking of the atmosphere in connexion with sound, he says:—"The air is one vast library, on whose pages are for ever written all that man has ever said or woman whispered."

Well may we have a care of all we do, or all we say; every sound, through the medium of vibration, may be registered; every act, through the influence of light, may be photographed; so that, as an American author beautifully writes:—"Acuter senses than ours shall see them as on a great canvas, spread over the material universe—perhaps, too, they may never fade from that canvas, but become specimens in the great picture gallery of eternity."

How exquisite and harmonious are the arrangements of the Deity, as exhibited in the little we partially comprehend! How that acts and thoughts which, in their own essence, may be evil, may be the means of producing physical good! The lofty thoughts of the moralising sage, the soft airy nothings whispered by the fond lover in his mistress' ear, however differing in degree, may be alike beneficial in their physical effects. No thought without electricity. No utterance without vibration. Both effects start on their unceasing career of action and reaction in the economy of the universe, and will only cease when materialism shall be no more. Exclude the sunlight from our earth, and a very short period would elapse ere human beings would cease to exist. It is the medium through which we enjoy our most pleasurable emotions, and has with the present century disclosed a mine of enjoyment which will furnish philosophers with intellectual food for untold ages. It clothes us, feeds us, heats us; it decks the trees in their summer garb, and sparkles in the frozen icicles of winter; it shimmers in the waters around us, and leaves its last glorious impression on the gorgeous-tinted clouds which surround the great luminary from whence it emanates, as it sinks from our vision in the far distant west. Above, beneath, around us, it renders the face of creation joyous; in short, what was the world which we inhabit until the Omnipotent's fiat went forth, "Let there be light!"

The Chairman was frequently interrupted in his interesting address by the hearty plaudits of the company, and the conclusion of his eloquent peroration was followed by loud and long-continued applause.

In the course of the evening, Dr. Taylor illustrated the beautiful effects of photography by the agency of the magic lantern. Several Egyptian views were thus shown with marvellous truthfulness on a disc of twelve feet diameter, and constituted a novel and instructive exhibition, which might be applied, with great advantage, to popular entertainments. Mr. Gilmour, a member of the Society, gave an interesting sketch of a photographic tour through Italy; and the proceedings of the evening were agreeably enlivened by the musical efforts of Mrs. Alexander, Miss O'Connor, Mr. Walker, and others. The *conversazione*, which passed off with the utmost *eclât*, was wound up with the usual vote of thanks.

POSITIVE COPIES BY THE ELECTRIC LIGHT.

By T. A. Malone.

I beg to lay before you a small contribution and specimens which may be interesting to practical photographers generally, and which may perhaps be occasionally of great service to both professional and amateur operators as well as to the public. The difficulty of producing satisfactory positives in the winter time is well known, a whole day's exposure having been found insufficient for producing, on the ordinary copying paper, a single impression from the negative. The prompt execution of portraits and other work has, in such cases, hitherto been impossible. Having lately turned my attention to experiments with the view to the use of artificial light for purposes of scientific photographic research, during the too frequent absence, this season, of our master-light, the sun, I have ascertained that one or more negatives of moderate size may be copied in a quarter of an hour by simple exposure in the usual copying frame to the rays emanating from the gas-carbon points of Duboscq's electric lamp; by concentration with a mirror and lens, the effect might be produced in even a less time. On the day of the experiment, a dull October day (two to three p.m.), the same amount of exposure to the zenith light, the sun being obscured, gave but a faint impression with part of the same negative that was used in the photo-electric experiment. The sensitive paper used was also, like the negative, purposely halved in order to make the experiment a fairly comparative one. It will be observed that the resulting pictures, fixed simply in hyposulphite of soda, and not toned by gold, present characteristic differ-

ence of colour. That produced by the yellowish foggy daylight is inferior in colour and richness and depth of tint to the one obtained by the brighter, purer electric light. I have observed some years ago a similar difference when one and the same negative was copied on a dull day, half under a yellow glass and half under a blue one. A final comparison of results indicates that the electric light surpassed in quality the daylight with which we were favoured on the day in question. It will be observed that the result of the experiment is further useful as proving that all the ordinary processes of our art can be rapidly and clearly demonstrated to an auditory or class at any hour—by night or day. Moreover, the relative photographic power of the electric light being thus more exactly demonstrated, I hope to be able to use it for important researches during the winter, when the sun is absent. I think my results already show that it is a superior agent to atmospherically-deteriorated sunlight. I trust, on a future occasion, to be able to communicate the results of experiments I have determined upon, with a view to compare more thoroughly the relative photographic properties of these and other varieties of light. In conclusion, I think it right and only just to state that I owe to Mr. Gassiot, whose liberality in such matters is well known, the use of the Grove's battery of forty cells which served for the experiment; and to Mr. Warren De la Rue I am indebted for the Duboscq lamp. The laboratory of the London Institution furnished all the other requisities.

New Way to Keep a Sitter Quiet.—We have read a story of an artist "way down south in dixie," who adopted a novel expedient to keep his sitter quiet. He had tried all sorts of suasions without success, when it occurred to him that the strongest of all human motives is fear. As soon as he had completed his adjustments, he suddenly draws a revolver, and levelling it at the sitter's head, he exclaims in a voice and with a look suggestive of lead and gunpowder: "Dare to move a muscle and I'll blow your brains out." We have not seen any of the pictures produced by this process, but have no doubt that they present some interesting peculiarities.—*American Journal of Photography.*

Exhibition.

LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

Cards of invitation were issued for the private view of the eighth annual collection of photographs, by the authorities of this society, for the 12th instant, upon which occasion a goodly gathering of photographers and their friends took place at the old quarters, No. 5, Pall Mall East, where most of the preceding Photographic Exhibitions have been held. A large amount of interest was manifested upon the occasion, as well by visitors as photographers, evincing the steady progress in popularity achieved by our favourite pursuit. It would be quite impossible for us to enter into any lengthened and detailed criticism of the various works displayed on account of the proximity of our day of publication; yet, we are not willing to forego altogether some account of the present collection, as, by the time these lines meet the eyes of our readers, the Exhibition will have been opened to the public, of whom many will be glad to know what is in store for their entertainment.

The hanging committee has adopted a very judicious modification of a recommendation from the pen of our esteemed contributor, Mr. A. H. Wall, which appeared in a paper published in our pages but a short time since, relative to the aggregation of the works of each exhibitor. To have carried out such a plan in its entirety would have required a very much larger amount of space than was at the command of the committee; and we are by no means sure that a rigorous adherence to this plan would have so greatly tended to the general excellence of effect. The works of each contributor of but a few specimens have, as a rule, been kept together; but, when they have been tolerably numerous, they have been arranged in what we may designate as several *symmetrical masses*, so that there is no difficulty, if the visitors be so minded, in going through each exhibitor's works *seriatim*.

The *coup d'œil* is decidedly pleasing, and the works in detail do not take off from the first impression. We cannot forbear remarking, however, upon the extreme complaisance of the hanging committee in according so large a space to the productions of a few portraitists, including a very considerable number of coloured specimens, which have been, however, judiciously arranged together, but which occupy very nearly the entire of the south side of the room.

Most of the other specimens are contributed by the old familiar veterans of the photographic art, including the names of Bedford, Fenton, Mudd, Robinson, Morgan, Wilson, Downes, Lyte, Dixon, Piper, &c.; while the absence of a few of the celebrated names is no less remarkable. We noticed nothing from Rosling, Frith, Rejlander, Llewellyn, Turner, White, or Thurston Thompson. As some compensation, however, we find a few new artists that are likely to be men of mark, amongst whom we may cite David Campbell, William Lloyd, and P. Dovizielli.

So much for general observations. We will now proceed to make a few particular ones in connexion with the works displayed for our admiration.

On taking up a position in the centre of the gallery, and glancing around, we are first struck with the fact that Mr. Roger Fenton has come out in an entirely new character, and may now be regarded in the photographic world in the same light as Lance amongst painters, whose studies of fruit and flowers (oddly enough designated "still life") are of a world-wide reputation. The present collection is enriched by about a dozen of the most charmingly-grouped specimens of magnificent samples of fruit and flowers, so completely in the manner of the renowned artist already named that, on first seeing them, we could not help exclaiming—"How delighted Lance would be with these!" It is not a little difficult to make a choice from amongst such a collection, but, perhaps, that on "the line" a little to the right of the centre and one immediately below it, are amongst the most charming. In the former, the petals of a delicate rose and those of a lily are rendered with exquisite felicity. That group a little below "the line," to the left of the centre, is also very beautiful. We congratulate collectors of photographs upon the new pleasure that is in store for them in acquiring some of this novel class of productions.

It must not be supposed that, in assuming a new character, Mr. Fenton has abandoned his old ones; on the contrary, as a landscape operator, he comes out in as full strength, so far as skill is concerned, as in any former year. Amongst these works we may mention specially, *The first view of Ullswater from the Keswick Road*, and a charming view of *Derwentwater looking towards Borrowdale*, somewhat in the style of Mr. Wilson, of Aberdeen. The mention of this gentleman's name is opportune, for, on turning towards one of the centre screens, we recognise with pleasure some of his artistic gems, which, though but Liliputians in size, are true giants in beauty. There are six *Studies of Sunset in the Loch of Park*, Aberdeenshire, and as many of sea views, including the *Great Eastern at Southampton*, which, in their stereographic form, we have so recently noticed that it is needless again to criticise them. There are six other subjects also, only one of which is familiar to us. Two of them deserve especial notice—*A View in Glencoe*, in which the gathering mist on the mountain side forms a prominent and striking feature; and *Loch Katrine*, in Perthshire, which presents a scene of placid beauty seldom equalled.

Mr. Bedford's works are always fresh and always welcome, doubly so when they include (as on the present occasion) many well-remembered scenes, some of the most charming in Somersetshire and the North of Devon, Lynmouth, Ilfracombe, &c. We have also records of the late excavations at Uriconium (Wroxeter), and a gem entitled *A Study of Nature*, in which the rugged stem of a tree is surrounded by a charming conglomeration of ferns, ivy, meadowsweet, and brambles.

A near relation of the preceding is a *Study of Foliage*, by Mr. Dixon Piper, on the north wall of the gallery, in which the dock, coltsfoot, ferns, ivy, &c., take part.

The post of honour—the centre of the top of the room—is awarded to Mr. Henry P. Robinson's important composition picture of *The Holiday in the Wood*, which we have recently described. The same artist has also another production or two of minor interest.

Mr. Mudd has lost none of his former skill, and will certainly gain in prestige. Of many fine productions, the most exquisite is one, *On the Greta, Rokeby Park*, in which the effect of atmosphere and distance is unusually fine. Another picture, designated *In Teesdale*, is also particularly noteworthy.

Mr. Downes exhibits numerous reproductions of paintings, some of which are familiar to frequenters of the various metropolitan Art Exhibitions. It is very observable how the kinds of colour employed in the paintings influence the photographic results. The vivacity and bustle of Mr. Hicks's picture of *The General Post Office* are capitally rendered, but we miss the colouring; while in Mr. Lewis's *Punch* the loss is but little felt.

Mr. Maxwell Lyte is, as usual, in the first rank among photographers, his contributions to the present exhibition being unusually fine, possessing a depth of poetry quite out of the common way. His *Valley of Pierrefitte* and *Valley des Eaux Bonnes* leave nothing to be desired.

Mr. Lyndon Smith, like many artists who adopt a mannerism, and elaborate a perverse idea, has, during the past season, still further *mist-ified* his productions. The artistic merit—spoiled to some extent as it was, but which however those of last year undoubtedly did possess—is, in our estimation, entirely wanting in those now displayed. What can be the value of such a "*thing*" as that immediately over the entrance door? An under-exposed branch of some tree, with a background of—smudge, looking like a rough landscape on blotting paper that an unfortunate black beetle, which had just taken a bath in the inkstand, had been crawling over.

The exigencies of time and space will not permit us to make more than a casual reference to a few other subjects.

Mr. Heath makes a fair show. His *Gardener's Cottage, at Endsleigh*, is the specimen which we prefer, and, though the foliage has been sadly interfered with by a stiff breeze, the evil effects have been cleverly counteracted by vignetting the subject.

Mr. William Lloyd may become a clever artist. His view in Beckworth Park is good.

Mr. Bourne has two frames, each containing four subjects, all worthy of attention.

Mr. David Campbell is also an operator possessing considerable skill: his *Auld Brig o' Doon*, Ayrshire, and *Home! Sweet Home!* are excellent landscapes. We perceive that Mr. Wardley puts in an appearance with a scene in *Ambleside* that is very nice. Captain Dixon has some interesting illustrations of Indian scenes. We must not omit to mention a very fine photograph of *Raglan Castle*, on two pieces of paper admirably joined—and almost perfect, whether regarded as a picture or a photograph—the work of Mr. Earl.

Mr. Reeves Traer comes out with a few of his microscopical illustrations.

Mr. Morgan, of Bristol, exhibits some of his well-known landscape beauties, of which we prefer *A Scene in Leigh Woods*. M. Claudet has an admirable likeness of Dr. Becker amongst his numerous portraits. While on this subject, we cannot forbear a few words of high commendation to Mr. Hering for some admirably executed and artistic portraits of children.

With this we must for the present close.

Foreign Correspondence.

Paris, January 11, 1860.

Some months ago I wrote to a friend of mine, belonging to the Expeditionary Corps in China, asking him to communicate to me any information that might be interesting from a photographic point of view. He informed me in his next letter that the stereoscope was in full vogue at Shanghai. The Chinese, whose patience is indefatigable, and who have a mania for imitating everything, had copied with marvellous correctness, he said, the views, whose clearness and delicacy they had so much admired. He added that, speculating on the dissolute morals of the country, European photography had inundated the shops with pictures which were more than light, and that these detestable productions were to be seen, not merely in the *sing-songs*, but in the flower-boats.

In answer to subsequent inquiries as to the photographers to be found among the French officers, he wrote on the 25th of August:—"Antoine Fauchery, official correspondent of the *Moniteur*, is also attached to the *Photographic Mission* of Colonel Dupin, Chief of the Topographic Office Expeditionary Corps. We had also, at the Tche-fou camp, a M. Legrand, a French photographer of Shanghai; but, besides his not being a first-class artist, he has given himself to the liquor trade with the army, and has abandoned the objective for the *petit verre*." Thus, according to this information, there are at least three persons on the theatre of war capable of taking views with the camera, without counting our ambassador, Baron Gros, himself a master in the art. I know that in his high official position he has neither the means or the leisure for turning his operative talent to profit. Still, for those who know him as we do, it is a matter of astonishment that he did not secure the services of one of the persons above mentioned for the representation of the eminently curious objects offered by the country which has been traversed by our troops. I know nothing of Colonel Dupin; but I know that Fauchery, of the *Moniteur*, is a pupil of Nadar, and, consequently, capable of obtaining excellent results. With regard to M. Legrand, I have seen some of his stereoscopic pictures, and, though they are not of the best, they indicate a very sufficient practical knowledge. With these facts before me, I have been unable to understand the regret expressed by General Montauban in his official report of the capture of the Emperor's summer residence. His words are:—"A volume would be necessary to paint all that I have seen: my greatest regret is, that I had no photographers in the expedition to reproduce that which words are powerless to express." It is certain that men of art and of science, and all those who appreciate the value of the artistic riches described with so much enthusiasm by the General-in-Chief himself, will regret, as he does, that at least the image of what was scattered or destroyed has not been preserved. Perhaps the leaders of the English expedition were more fortunate or more provident, and so were not reduced to bear testimony to the utility of photography by deploring its absence.

Those of your readers who have been at Paris during the week separating Christmas from New Year's Day will remember that at that period the footways of our boulevards and leading thoroughfares are bordered by wooden booths, sheltering a host of small dealers. These are mostly work-people, who having bought second-class articles and waste goods at a low price, take advantage of this moment of universal purchasing to sell them for a modest gain. In previous years photography had made its appearance in these open-air bazaars: it had been represented by stereoscopic views on paper, which were half effaced, or which bore traces of defective printing. This year, the goods of this kind were of better quality and of a higher price. Card-portraits lay side by side with stereoscopic pictures; and here and there were to be seen the fashionable photographic albums. The stall-keepers that had selected this branch of Parisian commerce must have been satisfied with their choice, for certainly their receipts were not among the smallest. The licensed publishers, stationers, and printsellers had surpassed themselves in their costly display, in which photographic novelties made the principal figure, and which the amount of their transactians amply paid for. The portraitists, of whose embarrassment from the unfavourable weather I spoke in my last letter, will not have to complain. A fourth-class man has been mentioned to me at whose establishment people were obliged to take their ticket of order two or three days in advance, according to the practice of the most reputed houses. Most letters containing the compliments of the season contained also the portrait of the friend or relative who had written them, and asked for the like in return. It was a general interchange of faces—faces pretty or plain—faces full of dimpling grace, or furrowed by the plough of time—but faces ever welcome; for those even which were not dear to memory at least augmented the collection already begun, and so had their value.

Apropos of portraits: a story was related to me yesterday, which will give an idea of the manner, more ingenious than honest, in which certain ambulant photographers of the class I have already described to you, turn to account every circumstance for *exploiting* the public. One of our most renowned and fashionable portraitists lately announced in the journals that he had just installed a branch establishment in the neighbourhood of Boulogne. Up to the present time, the ground which this branch establishment will occupy is unbuilt on. However, the eager amateurs who repair to the spot find at the door a photographer, armed with his objective, who accosts them thus:—"I am one of M. ——'s first operators. His new operating-room is not yet built; but he has commissioned me to offer my services to those who may present themselves. If you will be kind enough to follow me, I will take your portrait at once." And he conducts the visitor to an adjacent booth, making many excuses on the way for the rustic simplicity of the premises. Many persons prefer to return on some other day; but some allow themselves to be caught, and so the trick is played.

There is some talk at present of experiments whose results I shall probably be able to communicate to you soon. They are on the application of gluten to photography. This body acts chemically, as does albumen, and it is thought that it may perhaps render the same services as the latter, if used as a vehicle for the luminous image. This would be a real progress in a practical point of view, on account of the difficulties presented by albumen in its preparation.

ERNEST LACAN.

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Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE LATE MEETING OF THE LONDON PHOTOGRAPHIC SOCIETY—MR. DALLMEYER'S TRIPLET LENS—APPARATUS FOR INDIA.

To the EDITOR.

SIR,—It appeared to the chairman that the remarks I was addressing to the meeting last night would originate a discussion which might encroach upon the time that would be required by Mr. Fry's paper. It was for this reason I gave way. I should be glad, however, to take this opportunity to put myself right with the meeting, by making the following explanation:—

Prior to the 4th December last, I gave notice to the Secretary of my intention to make, at the meeting of that date, some remarks upon Mr. Dallmeyer's triplet lens; and if the discussion upon Mr. Thomas's paper had not occupied the time it did, I should have done this. I maintain, therefore, that my notice held good for the meeting of last night; and as I yesterday reminded Dr. Diamond of my claim, I think it will be seen that my proceedings were quite in order. I mention this because, at the conclusion of the meeting, I was told that what I had been doing was irregular, and that the chairman was justified in stopping me. To those who think so, I address the foregoing explanation.

As our next meeting will probably be entirely occupied with the business of the annual meeting, I will now ask permission to use your Journal for the remarks I desired to make last night.

There is no question that Mr. Dallmeyer's triplet lens has its peculiar advantages, and that it provides against certain defects of certain lenses; but I should like to be convinced that it fulfils some other conditions. Mr. Dallmeyer says it does. I do not mean to say that it does not, but I confess that I cannot exactly understand what is meant by the assertion that "it is *quicker acting* than the orthographic or single combination lenses." "Quicker acting" is so peculiar a term, that I ask whether it is intended by it—the *size and the definition of the resulting pictures being equal*—that the triplet lens will produce its pictures in less time than the orthographic or single lens?

My own experiments give a result the very reverse of this; but perhaps I do not understand Mr. Dallmeyer's mode of comparison. I must, however, insist that no comparison can be just which does not include perfect equality in the size and definition of the pictures produced.

I cannot help calling attention to the fact that Mr. Dallmeyer's assertion is not made of the Petzval combinations generally, but that for his comparison with lenses of that principle he has singled out the orthographic, which is the lens of Mr. Ross. It is really but reasonably fair, therefore, that there should be no ambiguity about the terms or the manner of the comparisons made. I will merely add, that if it should lie in Mr. Dallmeyer's power to demonstrate the accuracy of his assertions, he will have no cause to regret the remarks I have made here; but, on the other hand, I think that if one or other of those assertions fail to be verified, it will be admitted that the notice I have taken of them is completely justified.

Allow me now to take advantage of this opportunity of addressing you, to call attention to an advertisement in a recent number of the *Photographic Journal*, in which a camera is stated to be "the only camera that will stand the climate of India."

Now, there is no question that, in an advertisement, every one has a right to speak of whatever he may produce new and good in the most favourable manner possible; but no one is justified in an assertion which all who are acquainted with what has been done by photography in India and elsewhere know to be untrue, and which can only be hazarded to catch the ignorant. In my own name, therefore, and in that of the several other manufacturers whose apparatus has been, and is, most successfully employed in India, I protest against this unfounded assertion.—I am, yours, &c., VERNON HEATH.

43, *Piccadilly, 9th January*, 1861.

[As Mr. Heath's remarks referred to statements made in *advertisements*, it is probable that the chairman considered them irrelevant, the advertisements not being then, or at any previous time, before the meeting. We do not perceive the same objection to the discussion in these columns, consequently afford space for the insertion of the preceding, Messrs. Dallmeyer and Rouch having the privilege of reply through the same channel, should they see fit to avail themselves of it.—ED.]

DECOLORISATION OF THE SILVER BATH.

To the EDITOR.

SIR.—I have turned up the *London Photographic Journal* of 8th January, 1859, and have read Mr. Elliot's paper, and find the use of citric acid there mentioned is for a very different purpose than the decolorisation of the silver bath.

Mr. Elliot recommends it for rendering an old collodion bath suitable for printing purposes. There is no evidence in this article that Mr. Elliot knew the properties that citric acid possesses of decolorising an old albumenised-paper bath, although he mentions, incidentally, in the analysing of the precipitate, that it was slightly discoloured by decolorising the plain-paper bath.

I do not believe that any one understood from Mr. Elliot's article that citric acid was to be a substitute for animal charcoal, or kaolin, this being the object for which I recommended it.

Mr. Elliot's use of citric acid is a very valuable one, but in no way forestalls my application of it.—I am, yours, &c., J. G. TUNNY.

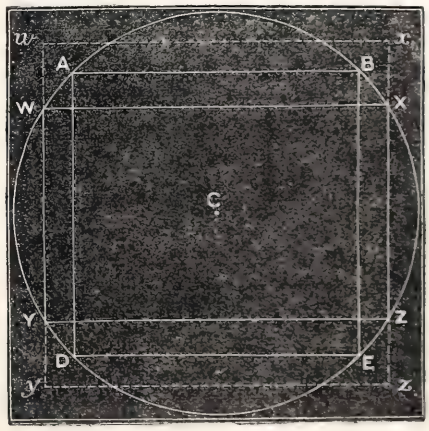
THE AREA COVERED BY A LENS.

To the EDITOR.

SIR,—A photographic lens is said to cover distinctly a given size of glass, which is always more in one direction than the other—*e.g.*, 8½ by 6½, 6 by 5, 4¼ by 3¼, &c. I do not understand why this should be, and I shall be much obliged to you for an explanation. Is not a photographic lens a segment of a sphere? and if so, I should have supposed the definition equal in every direction. If I am in error, would the fact be that the definition extends further in one direction than the other? Is *this* in the vertical or the horizontal axis? But, supposing the size of the picture to be 8½ by 6½, is the 8½ horizontal or vertical? and can it be reversed so as to make the most distinct direction be either way? I fear I have not made out my difficulty very intelligibly; but I dare say you will comprehend it, and no doubt clear it up. Apologising for thus troubling you.—I am, yours, &c.,

MEDICUS.

[You are quite intelligible, and we are not surprised at your being puzzled about a matter that has been a stumbling-block to many. It is, however, very simple, as you will perceive by the following:—The "field," or surface, covered by a photographic lens is not absolutely a segment of a sphere, but of a curved figure approaching more or less closely to that of a paraboloid or ellipsoid, only a small portion of which approximates somewhat to a plane. Now, if we cut off from this curved surface at right angles to the axis of revolution, we shall have a *perfectly circular* disc, but slightly concave, which represents the plane of delineation of your lens. We will suppose this to be of 10½ inches diameter. Now, by drawing a circle of this size (that is, 5¼ inches radius) upon a sheet of paper, you are in a condition at once to perceive why your lens can cover a rectangular surface of 8½ inches by 6½ inches, though not of 8½ inches square; because with the larger parallelogram the angles would extend beyond the circumference of the circle—that is, beyond the part in which any definition is formed. It will, however, cover a square surface of about 7½ inches siding.



The above diagram will render this more intelligible. With a centre, C, strike the circle A B X Z E D Y, and let W X Y Z represent your plate of 8½ by 6½ inches: it is clear that the whole of it falls within the circle; but if you extend it to a square of 8½ inches siding, then it will cover the space occupied by the dotted lines, w x y z, and all the angles will fall beyond the circle. The square, A B D E, however, which falls within the circles, can be covered by the same lens as would do the work upon the 8½ by 6½ plate.—ED.]

"TRADE SECRETS" IN PHOTOGRAPHY.

To the EDITOR.

SIR,—Some articles have lately appeared in your publication in reference to the centering of lenses, and which arose out of an observation made by a member of a London Society, who stated that he held a "trade secret" which enabled him, and perhaps two or three others, to effect that operation in a superior manner. I conclude that the question itself is now to be dropped, and I think you may safely allow it to pass; but another matter arises from its ashes, which demands, I believe, your attention. It is not the first time that we have heard of these "trade secrets," and I think it needful that we should understand the position of those who hold them.

I am not one who believes that a man is bound to reveal everything he knows. I see no reason why there should not be secrets in the photographic as well as in other trades; and I consider that a man who has

spent much time and money, and made many other sacrifices, is fairly entitled to his reward. Such a man knows well enough what he will be likely to gain from public generosity and gratitude: he will think instinctively upon the fate of poor Archer, who, having given his discoveries to the world, was coolly deserted by numbers of those who had built their fortunes upon his ruin.

I blame no man, therefore, for keeping that to himself which he has hardly earned; but I think that he should from that time, and in common honesty, retire from societies which are established for the purpose of making public those things which he endeavours to conceal within his own bosom.

It may be said that the "trade-secret" man does no harm; for if he do not tell everything he knows, he communicates something. I deny the position altogether. One in such a position will naturally be constantly fencing (perhaps without meaning it) to destroy a discussion which he finds to be dangerously approaching his secret; or he may be found to give an opinion which he cannot deal with honestly, and may thus mislead those who look up to him as a high authority. I submit that to belong to any society for the advancement of an art, especially to take a prominent position therein, and to keep to ourselves that which we know will benefit it, is to sail under false colours, and to adopt a system injurious to that object which we profess to forward.—I am, yours, &c.,

W.

GALLO-CITRATE OF IRON DEVELOPER.

To the EDITOR.

SIR,—This developer has been long known, and may be found in *Hogg's Practical Manual of Photography*, 5th edition, p. 59, published by Bolton, Holborn Bars, in 1856. I copy from that work the following:—

"FOR NEGATIVES—No. 1.

Pyrogallic Acid	3	grains.
Glacial Acetic Acid	1	drachm.
Distilled Water	1½	ounces.

No. 2.

Sulphate of Iron	10	grains.
Acetic Acid	½	drachm.
Distilled Water	1	ounce.

Mix equal parts of 1 and 2 immediately before they are required for developing the pictures." The only difference here is the use of acetic instead of citric acid.

Again, in THE BRITISH JOURNAL OF PHOTOGRAPHY, Vol. VII., p. 96, at the conclusion of a paper *On Glass Transparencies*, read by Mr. J. P. MacAdam, at Glasgow, he says:—"I use the gallo-citrate of iron developer, made by mixing together solutions of pyrogallic acid and protosulphate of iron, and adding solution of citric acid, till the precipitate be barely dissolved." Here the citrate is substituted for the acetate.

I am afraid Mr. Tunny's acquaintance with "the periodical or other literature of photography" is not very extensive, or the above could not have escaped his observation.*—I am, yours, &c.,

AN AMATEUR.

P.S.—I am inclined to think that the proportions given in Hogg's *Manual* are better than those adopted by Mr. Tunny. Each ounce of the gallo-citrate of iron solution should contain one grain of pyrogallic acid and five grains of iron, unless in very cold weather, when the relative quantities may be augmented.

DEVELOPERS.

To the EDITOR.

SIR,—If Mr. Tunny refers to page 96, in the April number of your Journal, he will see that his developer was given to the world months ago. I should much like to see the subject of developers ventilated in your columns. Some use the same proportions for all pictures, whether produced by lenses of long or short focus. My own experience goes to prove that for lenses up to fourteen or fifteen inches focus, one and half grains of pyrogallic to three-quarters citric to the ounce of water is best; but with lenses of longer focus, a stronger solution is required, otherwise, even if a very long exposure be given, the results are chalky. With a single Ross lens of twenty-inch focus, half-inch stop, use five grains pyrogallic, one grain citric, to five ounces of water, with an average exposure of two and half minutes—Ponting's collodion. Some operators say that a weak solution and prolonged development is best. My opinion is that a more brilliant picture is produced by a strong developer. I fancy that there is a slight loss of intensity, perhaps; but as people are beginning to think that a white sky is not all that is required in a photograph, this loss of density becomes a positive gain, if the sky does not print through too much. I have a weakness for an iron developer; but unless the exposure is rightly timed to a second, the necessity for using pyrogallic occurs, and in hot weather the plate is almost sure to stain, though I found, during last summer, that after well washing off the iron, if a final swill be given with distilled water, it decreased the chances of stains.

The tent of Mr. Louch, of which you gave a drawing in your last number, has the usual drawback, no room where you want it—*i. e.*, in the centre; but at the bottom room enough to dance a polka in.

I am, yours, &c., R. GORDON.

* See *Ante*, page 18.

QUASI-NEW DEVELOPER.

To the EDITOR.

SIR,—Under the head of "Photographic Society of Scotland," in your impression of January 1st, 1861, Mr. Tunny, of Edinburgh, in recommending to the notice of the Society a new developer for negatives—a combination of pyrogallic acid, sulphate of iron, and citric acid—is reported to have expressed his belief that it had never been mentioned in "any periodical or other literature of photography."

If Mr. Tunny will take the trouble to turn to page 96, Vol. VII., of THE BRITISH JOURNAL OF PHOTOGRAPHY, he will find the same developer, &c., described in a paper read by Mr. MacAdam, at a meeting of the Caledonian Club.

I may also mention, *par parenthese*, that this developer is by no means new; as on a visit to Scotland, last September twelvemonth, Mr. Rodger, of St. Andrew's, no mean authority, was so good as to write it down for me, and I did not understand from him that even then it was new, although I certainly was under the impression that at that time it was known only to a few.—I am, yours, &c., R. M. S.

Exmouth, 5th Jan. 1861.

[We have reason to conclude that it is not improbable that both Mr. MacAdam and Mr. Rodger may both have derived their acquaintance with the developer, directly or indirectly, from Mr. Tunny, whom we do *not* suppose, by the way, to have only recently employed it.—ED.]

ANSWERS TO CORRESPONDENTS.

WE beg to return our best thanks to the numerous friends who have so kindly expressed good wishes for the continued success of this Journal, as well as for those of a personal character. Time will not permit us to acknowledge privately so many letters as we have received of this nature, and we trust that each will regard this notice as especially addressed to himself.

J. H. B.—Not necessary to interfere with the bath. The quantity of bromide may be half a grain, without detriment.

CAMERA.—We have the article in MS., and it shall appear as soon as we can find room for it.

A. S.—We have forwarded your note to the publisher, who will, no doubt, have rectified the omission before this.

SALIS.—We prefer the chloride of *ammonium* for the purpose; partly because the addition of liquid ammonia to the mixture does not interfere with the result; and partly because that salt is less apt to be impure than some of the other chlorides.

FAILURE.—You have omitted a very important ingredient from your developer, if you have accurately described your manipulation. Of what do you suppose the image is to be formed, without you add a few drops of solution of nitrate of silver, which you have previously removed in preparing your plates?

ALMANACK.—We have had one or two complaints about non-receipt of a copy. We are assured by the Publisher that a copy was furnished with each number of the Journal for 14th Dec, 1860, consequently any neglect lies with the bookseller. Any Subscriber not having received a copy of the Almanack can have one forwarded on application to the Publisher.

F. S W.—Much will depend upon the nature of your collodion and condition of your sensitising bath.—You give the diameter of your lens, which is of no consequence in the consideration, and omit its focus, which is important.—We doubt whether you will find five minutes too much in the best part of the day. Developer:—Protosulphate of iron fifteen grains; dissolve in one ounce of distilled water, and add half a drachm of glacial acetic acid.

AMATEUR (Harrogate).—The essentials to a good colour in glass positives are:—*Pure* collodion, containing a bromide as well as an iodide for sensitising material, with a small portion of free iodine; but, above all, an absence of organic matter in the nitrate bath, which should be acidified with *nitric* acid. It is not improbable that your nitrate of silver may be contaminated with organic matter. See the Almanack issued with our last number of Volume VII., 15th December, 1860, page 28.

ALEXANDER SHIRREFFS.—Your questions are not *photographic*, and would take up too much space to reply to with accuracy. You have not named the *form* of your lenses, but if plano-convex, you may arrange them thus:—Tube of body six inches long; object-glass, plane side towards *object*; eye-glass at opposite end of tube, plane side towards the *eye*; field-glass same position, but two inches nearer to the object-glass; diaphragm between the last, at one inch distance from the eye-glass, which also requires a diaphragm in front of it (nearer to the eye), about three quarters of an inch from its surface. You must not expect much definition.

F. B.—1. Citric acid with pyrogallic will do very well for a negative developer. The quantity necessary depends upon temperature. In cold weather half a grain of citric to one grain of pyrogallic acid in one ounce of distilled water. In moderately warm weather the quantity of citric acid may be increased to one grain, and in very hot weather to two grains.—2. The entire quarter-plate combination may be used for enlarging from a negative about 2¾ by 3¼. The front lens alone is not well fitted for it at all, and would be so slow as to be quite unmanagable.—3. Fothergill plates should develop with the developer above-indicated, in from two to ten minutes.—4. Your mahogany box for drying should be varnished inside.—5. Ammonia does *not* produce insensitiveness in the wet process, but, on the contrary, fogging: when added to albumen, all the free ammonia disappears on drying.

H. H. H.—It would be impossible to lay down a definite distance for the stop to be placed from each element of the combination in all cases, because in lenses of the same denomination, even by the same maker, variations of construction do occur; but the correct place is readily ascertainable in all cases, thus:—Focus for a distant object accurately, and measure the distance from the object to the *shoulder of the screw* of the back combination, and call that distance A. Reverse the lens entirely, and again focus for the same object. Measure the distance from the image to the *same shoulder* in its new position, and call that distance B. Ascertain the difference between A and B, and divide it by two; the product will give the correct distance for the stop, measured from the same shoulder of the screw of the back combination. You must remember that by placing the stop in this position the following results will arise:—the marginal lines will be undistorted—the field covered will be larger, but it will also be *more curved* than with the diaphragm in contact with the front combination. The size of diaphragm must depend upon the subject delineated, and, if *smaller* than the front lens, the principle is carried out to some extent in all cases; the area of field affected by it being greater as the diaphragm is smaller, and *vice versa*.

*** In consequence of the very dull weather, Mr. Hughes has been unable to verify, by experiment, some important points in connexion with his papers *On Albumenising*. The continuation of Mr. Hughes's articles on this subject will, therefore, be postponed for a short time.—We are also compelled to defer till our next number the continuation of Mr. A. H. Wall's interesting series of articles on Photographic Colouring.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 135, Vol. VIII.—FEBRUARY 1, 1861.

Art-Photography.—An occasional retrospective glance at the incidents which occurred during the earlier days of any particular science or art is, when considering its actual state, generally interesting, and often profitable—the various phases through which it has passed not unfrequently presenting a complete cycle of events. This is the case to a double extent with regard to photography, upon which all the disturbing influences both of science and art act and re-act upon one another. The present moment is one in which the art-aspect is more truly in the ascendant than has ever heretofore been the case; and this we think arises partly because the scientific branch has made sufficient advance to enable the skilled operator to use his weapons with greater freedom than formerly; and partly because the two principal classes of photographers find by experience that they can neither of them well do without the other's aid. Almost immediately after the establishment of the Photographic Society it was threatened with a grand disruption, owing to the very dissimilar elements of which it was composed, chiefly men of science—whose ideas are generally practical, decided, definite—and artists, who are more addicted to the vague, speculative, and fanciful. Is it to be wondered at, then, that men who scarcely had an idea in common—whose very language was scarcely understood by the opposite section—should fail to coalesce with that cordiality which was hoped for? We have a very vivid recollection of the first few meetings of the Photographic Society: the spirit displayed was by no means amiable, and most certainly the artist section, which in cricketting language may be said "to have had the first innings," not only "threw the first stone," but did it in such a manner as to outrage every cherished feeling of the scientific portion. The fact was that many artists looked upon the new art with fear, not unmixed with jealousy, and hoped to make it remain in a thoroughly subordinate position; consequently they exaggerated its defects, patronised it with a supercilious condescension, and affected to consider that, if the scientific workers were diligent in improving photographic manipulation, it might one day prove a *useful handmaid* to the artist. It was intimated that no negative could be considered fit to print from until it had received the requisite improvement (!) at the hand of the artist, by the addition of a sky or back-ground; that the lines of the photograph were offensively hard and exact; and that the only way to obtain breadth of effect was to *put the lens a little out of focus.* One young gentleman went so far as to assert that the camera was unfit to delineate a picture, because it rendered the outline of every individual leaf exactly as in nature—declaring that the true artist would not copy any one particular leaf, but adopt a form that might be considered as exhibiting the *general type* of the whole, and repeat that as often as necessary in his drawing; and the same acute observer drew a caricature of the "photograph of a distant church," as seen through a railing—the said illustration consisting of one horizontal and a series of thick perpendicular black lines for the railing, surmounted by a pert-looking cock sparrow, a dim outline of the church being visible between the spaces of the railing. The only conclusion at which genuine photographers could arrive was that if the young gentleman ever had seen such a photograph *it must have been one of his own taking.*

We need scarcely state that this was rank heresy to the men of science, who now, in their turn, did injustice to the art section. They held out for "truth, the whole truth, and nothing but the truth." So indignant were they at the position which had been assigned to them, that we verily believe they considered it almost in the light of a concession to allow of the selection of a point of view. They were determined to have nothing whatever to do with art and artists, and hoped to beat them out of the field altogether. It was as if the *savans* and the artists had met on the opposite banks of a great river, and that the former declared the stream to be flowing towards the right hand, while the latter as vehemently asserted that it flowed towards the left—both holding a portion of the truth, but utterly forgetful that what was right to one party was left to the other.

Happily, this is now altered for the better. A more amicable feeling exists between the members of these two great sections. They have now some approach to a common language, though there are still many obscure phrases employed occasionally on each side; but, for the most part, they are willing to afford and to seek each other's aid. It is not now considered a very heinous offence to "black out a sky," or to "print one in" from another negative—a proceeding regarded formerly by the *scientiæ* as evincing the utmost turpitude, though smiled on by their "artful" brethren; but, singularly enough, the printing from several negatives, which appears to savour very much of the same character, has been more decried by the latter than the former.

It is wonderful how a squabble sometimes arises upon a mere question of words and names, while the facts are almost entirely lost sight of. We remember a legal anecdote with which we were highly amused at the time we heard it, and which illustrates this question. A witness under examination was asked—"You saw Mr. —— present on the occasion: what did he say about the matter?" The counsel on the opposite side objected that it was not a proper question, and that the answer could not be admitted as evidence. Cases were cited on both sides, and the contest was fast and furious for about half an hour, the witness remaining all the time an amused spectator. At last the court decided that the question was admissible, and again the question was put—"You saw Mr. —— present on the occasion: what did he say?" The reply was scarcely worth the squabble, and consisted of but one word—"Nothing." Although this question of "touching" or "not touching" a photograph may now be considered as in the same category as the above, we must not forget that at one time it really was of considerable importance; because, then, it would not have done to be under any doubt whatever as to what could and what could not be done by photography *pur et simple*, and all parties, including the artists, are now the gainers by the jealous precautions then taken.

We have been led to these remarks by a perusal and re-perusal of Mr. Hughes's capital paper on *Art-Photography*, pub-

lished in the first number of the current volume, pages 5 to 8, and which we recommend our readers to glance at a second time. Now, without going so far as to accept all Mr. Hughes's conclusions, we do say that we concur with the majority of them, especially with the following:—"He is the higher artist who produces the greatest results with the smallest means." On first reading the paper there were several remarks to which we took exception; but their number sensibly diminished on a second perusal. The fact is, the matter is discussed in a liberal spirit, guided by good, sound common sense, and we heartily commend a consideration of it to our photographic brethren.

Mr. Hughes draws attention to a method adopted by Mr. Mudd, of Manchester, with regard to skies, and with justice; for on examining this gentleman's productions now on view at the Photographic Exhibition we were much struck with the excellence of the effect produced, by a method, be it remembered, quite within the skill of any accomplished photographer. The artistic feeling is indeed requisite, but so also is it in taking the photograph.

The designation suggested of "artist-photographer" instead of "photographic artist," appears to us but a temporary palliative of a very ephemeral character, in place of a radical cure; for will not the pseudo-photographic artists who have shown themselves unworthy of the name as readily, nay more readily, adopt the newly-proposed style when it is perceived to hold a higher place in public estimation?

We can scarcely subscribe to the divisions of mechanical art and high-art photography as defined by Mr. Hughes; and we are not sure that we can conscientiously join in the outcry lately so lavishly bestowed against white paper skies—that is to say, to anything like the extent to which it has been raised by a small section of our brethren. We have come to the conclusion that, in this country at least, white paper skies are in nature the rule rather than the exception. Generally, albumenised paper is not so offensively white and chalky as to be obnoxious, though we allow that some plain paper may be so; and we admit the advantage of a slight, say very slight, tint being thrown in, even on albumenised paper, until we can obtain the natural clouds (when present), but altogether dissent from the opposite error now, alas! frightfully prevalent—that of giving the appearance to many landscapes of having been taken just prior to a thunderstorm. We point to Mr. Bedford's and Mr. Mudd's productions in the Photographic Exhibition as best satisfying the critical eye when we are unable to obtain the "genuine article," as Mr. Wilson frequently does. And here again we have a strong ally; for we perceive that Mr. Wilson, who knows so well the value of a natural sky, when from circumstances he is debarred from obtaining it adopts the other alternative, and leaves it quite or nearly white. We are quite conscious that in hazarding this assertion we have figuratively thrown down the glove: be it so, we only say—"Strike, but hear!"

Practical Optics of Photography.—We know of no subject upon which at the present moment photographers, as a body, feel a greater amount of interest than the practical application of the science of optics to the furtherance of their art. Our readers will therefore, no doubt, learn with pleasure that arrangements have been made with Mr. Rothwell for the publication of a *series of papers*, to be supplied by him, on THE PRACTICAL OPTICS OF PHOTOGRAPHY—the first to appear shortly, and the remainder of the series from time to time, as space and circumstances may permit.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XVII.

The *Chemical News* of January 12th, 1861, contains a paper by Mr. Frederick Field, F.R.S.E., in which photographers will be interested. The author speaks of the solubility of the chloride, bromide, and iodide of silver in certain solutions; and although his conclusions differ from those ordinarily received, they bear the aspect of being sound and trustworthy.

In sketching briefly the contents of this paper, we notice, in the first place, the solvent action of iodide of potassium upon iodide of silver. It is found to vary with the degree of concentration of the aqueous solution to a far greater extent than is usually supposed. The general impression probably is, that a strong solution of iodide of potassium dissolves a large quantity of iodide of silver, and that a dilute solution, say two grains to the ounce of water, dissolves a smaller quantity. Mr. Field, however, shows that, for all practical purposes, iodide of silver may be considered insoluble in a dilute solution of iodide of potassium—in other words, that the decomposition of the double iodide of potassium and silver by dilution with water is *complete*, and that it splits up entirely into free iodide of silver and free iodide of potassium. The same observation applies in a still greater degree to the double chloride of potassium and silver; and it is necessary to bear this circumstance in mind in studying some of the reactions which take place in photographic chemistry. For instance, the *rationale* of the alkaline chloride of gold toning bath is sometimes explained as follows:—A solution of double chloride of *gold* and sodium, in acting upon the image, becomes a solution of double chloride of *silver* and sodium, whilst an equivalent quantity of gold is deposited. The truth, however, appears to be that a solution of chloride of sodium of the strength indicated would not dissolve chloride of silver, and hence the reaction must be interpreted in a different manner.

Concentrated solution of iodide of potassium dissolves iodide of silver with facility: bromide of potassium dissolves bromide of silver, but with greater difficulty, and not in so large a quantity: the action of chloride of potassium or sodium upon chloride of silver is still less decided. Although iodide of silver will dissolve in a strong solution of iodide of potassium, it is insoluble in a strong solution of chloride of sodium. Even a saturated boiling solution of common salt dissolves only traces of iodide of silver, and these are re-precipitated on cooling.

Mr. Field's papers have shown most conclusively that, in aqueous solutions, the affinity of iodine for silver is greater than that of chlorine, whilst that of bromine stands intermediate. If you mix together solutions of iodide and chloride of potassium, and add nitrate of silver with the proper precautions, the first precipitation which takes place will consist only of iodide of silver, and not until the whole of the iodide has been thrown down will any formation of chloride of silver be perceptible. Supposing iodide, bromide, and chloride to be present in a solution, and nitrate of silver to be cautiously added, the iodide deposits first, then the bromide, and afterwards the chloride.

If a moist precipitate, consisting of iodide, bromide, and chloride of silver, in a state of mixture, be digested with a weak solution of chloride of sodium, no effect is produced: if with a weak solution of bromide of potassium, the chloride of silver is converted into bromide, and chloride of potassium is found in the solution; whilst if a portion of the same mixed precipitate be treated with dilute solution of iodide of potassium, it is converted entirely into iodide of silver, and the bromine and chlorine pass into the supernatant liquid, in combination with potassium.

The author next speaks of the action of hyposulphite of soda upon the chloride, bromide, and iodide of silver, and in this portion of his paper we were more especially interested, having recently published our own experiments in that direction. Taking equivalent quantities of the chloride, bromide, and iodide of silver, and suspending them in water, he found that it required *four times* more hyposulphite of soda to dissolve the bromide than the chloride of silver, and nearly *nine times* more for the iodide of silver. Further than this, when an equivalent quantity of iodide of potassium was added to the solution of the chloride of silver in the hyposulphite of soda, nearly the whole of the silver was re-precipitated in the form of iodide of silver. Thus it appears that a dilute solution of hyposulphite of soda has little or no action in dissolving iodide of silver. Few readers of the journals of photography will be prepared for this statement; and our own experiments scarcely led us to anticipate so complete an insolubility of iodide of silver in a weak fixing bath.

When iodide of potassium in excess is added to a solution of iodide of silver in hyposulphite of soda, a portion of iodide of silver is thrown down, according to Mr. Field; but if chloride of sodium in excess be added to a solution of chloride of silver in hyposulphite of soda, the solution remains clear, and there is no precipitation of chloride of silver. This statement we do not dispute; because, in the solution of chloride of silver by hyposulphite of soda, Herschel's soluble salt, containing two atoms of

hyposulphite of soda to one atom of hyposulphite of silver, is usually formed. If, however, the second salt of Herschel—viz., that containing single atoms of each—be dissolved in water, and chloride of sodium be added, we find that chloride of silver is immediately precipitated.

The inference which we are disposed to draw from the last-mentioned experiment is that, in using hyposulphite of soda as a fixing agent for chloride of silver, the action will always stop at a rectina point; and that the quantity of silver converted into hyposulphite will be less than if an equivalent quantity of nitrate of silver were substituted. We commend this matter to the consideration of MM. Davanne and Girard, who have given in their adherence to the statement that nothing but common salt remains in the liquid when the fixing bath is agitated with a large excess of chloride of silver.

In reference to the great insolubility of iodide of silver, we remark, in conclusion, that if the unwary photographer should at any time take a draught of his own nitrate bath in mistake for water, we advise him to use iodide of potassium as the antidote, instead of chloride of sodium. Chloride of silver is undoubtedly soluble to a certain extent in the juices of the stomach; but iodide of silver is more insoluble, and would be less likely to be absorbed into the system.

HOW TO ASCERTAIN THE AMOUNT OF NITRATE OF SILVER IN A SOLUTION; WITH REMARKS ON SILVER BATH METERS.

By C. Jabez Hughes.

[Read at a meeting of the North London Photographic Association, Jan. 30th, 1861.]

The purpose of the present communication is purely practical, and has reference to a paper I read before this Society about twelve months since. I then expressed my belief that many of the faults of albumenised prints arose from having the sensitising solution too weak, and urged the use of a little instrument known as the silver-bath meter, based on the principle of the hydrometer, to insure that the silver solution should not be employed below a known strength. I recommended it, not as a perfect instrument, but as one very simple and easily managed, and sufficiently accurate for *printing* purposes.

Since then I have heard it spoken of depreciatingly, and even denounced as leading *only* to false results. As I am not aware that any body has gone through experiments to ascertain how far it is right or wrong, or of comparing it with other instruments for accomplishing the same end; and, being convinced that I had derived much benefit from its use, I determined to make a series of experiments to satisfy myself of its exact value. Understand me, I am not the inventor of this instrument; I did not bring it out; I do not know who did, and am its advocate only so far as I believe it to be useful in aiding the production of good prints.

The most valuable substance in photography is nitrate of silver; it is the most important material that is consumed, and costs the most money. If the operator use it too strong he commits extravagance, and if too weak he defeats his own object. He ought to use it then the right strength, and know how to keep it so. Many methods have been proposed to ascertain the amount of nitrate of silver in an aqueous solution. They are nearly all based on changing the soluble into an insoluble salt; one method judging by the quantity of precipitate produced, the other by the amount of material required to cause complete precipitation.

The silver may be thrown down as a chloride, cyanide, sulphuret, oxide, or metal; but from the nitrate solution is most easily treated as a chloride.

When a perfectly accurate result is required—a nitrate solution being under examination—it must be strongly acidified with nitric acid, and pure hydrochloric acid added till all precipitation ceases. After well shaking, let it settle for some hours; decant and wash the precipitate well with distilled water. Do this many times till the last water does not redden litmus paper, then pour off the water and evaporate, finally fusing the chloride. Then weigh it carefully, and the amount of nitrate contained in the original solution can be inferred from the amount of chloride obtained, allowing 3½ grains of the nitrate for every 3 grains of chloride; the exact proportion is 3 of the former to 3·555 of the latter.

This method is theoretically correct, and if perfectly conducted must lead to exact results; but is far too troublesome and lengthy for our daily wants, and requires a person to be acquainted with chemical manipulation.

A much readier method is based on the principle that, as there is only a limited amount of silver in any solution, if we can know how much chloride is required to precipitate it we can infer the quantity contained. This saves all the trouble and time of collecting, washing, drying, and weighing the precipitate.

Many applications of this principle have been published. Mr. Heisch read a paper at the Blackheath Photographic Society, which was published in the journals, in which he showed how silver can be estimated to the hundredth of a grain per ounce of solution. In the appendix to Mr. Hardwich's *Photographic Chemistry* another method is given, accurate to a grain, or even half a grain per ounce of solution. These are based on making standard solutions of certain exact strengths of pure chloride of sodium, and according to quantity consumed is calculated the strength of the silver solution. These operations require to be conducted with the greatest nicety, or correct results cannot be obtained.

To obviate the necessity of calculations, certain instruments have been invented and graduated to scales suitable to the standard solutions that are used with them.

Mr. E. G. Wood's argentometer is a glass tube graduated from 0 to 60, which he fills to 0 with a standard solution of pure dry chloride of sodium 33 grains, distilled water 13 ounces 1½ drachms. Into a measure glass is placed a drachm of the bath to be tested. The saline solution is poured from the tube into the measure. A dense white precipitate immediately falls. The standard solution is added until the last drop or two causes no more precipitate, when the quantity of the solution used from the graduated tube shows, by the number of the divisions at which it stands, how many grains per ounce of nitrate the bath contains. Thus if 30 divisions are used the bath contains 30 grains; if 40 divisions, 40 grains, and so on.

Mr. Hockin has devised another form, a graduated syringe. It is used with a standard solution of pure dry chloride of sodium 69 grains (68·94) in 1000 minims (2 ounces 40 minims) of distilled water. In using, 1 or 2 drachms of the nitrate bath are to be added to an equal bulk of nitric acid and twice or thrice the bulk of distilled water. Fill the instrument to zero by slowly raising the piston, the point being kept under the test liquor. Depress the piston and cause the test fluid to pass into the portion of the bath prepared as above, vigorously stirring all the time. A heavy white precipitate of chloride of silver takes place directly. The solution requires well stirring and the standard fluid added till only an opalescent appearance remains, and when, after being used drop by drop, no more precipitate is formed, the operation is complete. The number of graduations left empty indicates the number of grains of nitrate contained in the quantity of solution examined.

Messrs. Horne and Thornthwaite's bath tester is a graduated tube, marked from 0 to 100. They employ a standard solution, pure dry chloride of sodium 84¼ grains in 20 ounces distilled water. To use, fill up to 0 with the bath solution to be examined, then gradually add the standard solution, shaking violently between each addition. When no more precipitate is produced the number of the graduations at the top surface of the fluid shows the number of grains per ounce of nitrate of silver in the solution tested.

The other little instrument I introduce professes to estimate the strength of the nitrate of silver solution on the principle of the hydrometer. To use it, it has only to be immersed in the solution, and the number on the stem of the tube, where the surface of the solution intersects, shows the supposed number of grains of nitrate of silver contained per ounce.

The experiments were performed with great care. Pure well-dried chloride of sodium was accurately weighed and dissolved in distilled water, as directed.

Of the five nitrate of silver solutions, two I made up myself—one ten grains to the ounce, the other thirty—and being tested directly they were mixed, no foreign substance was present to influence the result. Another solution was a portion of a bath, mixed up I cannot tell when, certainly some years since, and has always been receiving additions of nitrate of silver and distilled water, and was therefore a severe test. Another one was a sixty-grain solution of port wine colour, obtained from one of our Regent-street photographers, and had only been used to sensitise a few sheets.

The other bath was one made up about four months since, and been used for sensitising collodion plates only, and of course contained a good deal of ether and alcohol.

	Hydrometer Silver-tester.	Wood's Argentometer.	Horne & Co.'s Bath-tester.	Hockin's Argentometer.
New ten-grain bath	10	11	12	12
New thirty-grain ditto	30	31	29	31
Sixty-grain bath, port wine colour.	60	61	60	62
Very old albumenised paper bath	56	56	54	56
Bath used for collodion plates	16	25	23	25

From the above experiments it will be seen that, where the strength was exactly known, in one instance only did the "standard-solution" testers give *precisely* the amount, all else being one or two grains over or under. That there should be such variations is only reasonable; for, unless the most scrupulous care be taken, many errors may creep in. The chloride of sodium may not be quite pure or dry, and the graduated measure not quite accurate; the minim-glass with which the drachm of nitrate bath is measured, may not be perfectly graduated, and we know in commerce how they vary: there is also the risk of putting in two much of the test solution at the very last, to ensure all the nitrate being thrown down. All these are sources of error always more or less present when these instruments are in the hands of the general public. Again, as there is only a drachm of the nitrate solution experimented on, from which to infer the quantity contained in the ounce, it is clear that, if there be an error, it is magnified eight times.

It is hoped that these remarks will not be considered as depreciatory of these useful and ingenious instruments, as they are only intended to show the great care necessary to prevent obtaining false instead of true results.

In my experiments I might have used graduated glass measures that had been verified by standard ones; but I felt this unnecessary, as I wished to place myself in the position of an ordinary operator, and therefore employed the usual well-made graduated glass measures supplied by respectable houses.

If proper precautions be adopted, my impression is that these instruments may be relied on for giving within about two grains either over or under the exact amount contained in each ounce of nitrate solution. In my experience they appeared rather to overestimate the amount.

I do not feel at liberty to say which is the best of the three, as they are all different, and have each a merit peculiar to itself. Messrs. Horne and Thornthwaite's does not require any additional graduated measure for the drachm of bath to be examined, which removes one source of error. Mr. Wood's is very neat and elegant, and the result easily read off. He has two forms, and I used the cheaper one. Mr. Hockin's graduated syringe is theoretically perhaps the most perfect, and when a person has got used to it, he may work it very exactly; but I fancied, if the test solution were less concentrated, or the graduations made wider, it would be improved. I have, however, to repeat that they are all very ingenious, and do their work without giving any trouble of calculation. They are equally applicable to the baths for sensitising collodion plates and albumenised paper, but must not be used in solutions containing cyanides or hyposulphites.

The other little instrument, based on the hydrometer principle, when tried in new solutions of known strength, I found to be perfectly correct, and with the old printing solution—the real practical test—it corresponded with two of the "standard solution" tests and differed only two grains from the third. The principle on which it is constructed, the increased weight given to water by the addition of nitrate of silver, is quite hostile to the introduction of such light fluids as ether and alcohol; and as the bath for sensitising collodion plates always contains these, it was hardly necessary to try it on an old bath for this purpose. Still, as I tried the others, I tried this too, and, as I surmised, it did not register correctly, showing much less nitrate of silver than the bath contained. This instrument is not fitted for solutions of this character; but as the errors are always on one side, even this peculiarity may occasionally be useful, for it never can register *more* nitrate of silver than it contains—always *less*.

Speaking generally, then, this instrument is less perfect than the others, because it is applicable to only one of the two photographic silver solutions; but for that one it answers admirably, and may be depended on more certainly than the others. As this solution—the printing one—is the one that daily requires to be tested, the little instrument should be considered peculiarly fitted for it, and it only.

I began these experiments—for I have gone through a great number besides those reported—without the knowledge of the degree of accuracy of these argentometers. I determined to test them carefully and strictly, and to record the results impartially. I am happy, therefore, to bear testimony to the usefulness and practical approach to perfection of the gentlemen's instruments whose names I have mentioned.

With respect to the other instrument, I confess I had misgivings of it, for one cannot avoid being influenced by frequent condemnations; and I am agreeably disappointed with its accuracy in its more limited vocation. That it fails in the presence of ether and alcohol is what any intelligent person would be prepared for, and therefore should never be so used. Each instrument should therefore have credit for what is due to it; and, for utility sake, I think every photographer should have one on each principle — the "standard-solution" one for testing his collodion bath, say every week, which he should do himself, with all the precautions named to prevent mistakes; and the other for his assistant or printer, to be used daily, for he has only to immerse it in the solution and its strength is told.

After again rendering full justice to the other useful and ingenious instruments, I feel more confidence than ever in recommending the little "hydrometer silver-tester" for printing purposes, and conclude in my own words, used twelve months ago:—"The merits of this little instrument is its simplicity. Without professing analytical accuracy, or the perfection of more complicated instruments, it is sufficiently correct for practical printing purposes, and no knowledge of chemistry is required for its use. It is always ready, needs no calculation, and the dullest boy can employ it."

REMARKS ON THE TONING PROCESSES.

By Charles Heisch.

Will you permit me to say a few words on the subject of my remarks on the Alkaline Toning Process? I was quite prepared to find many who would be surprised to hear a doubt expressed as to the *superior* stability of the said process; but I was not prepared to find myself called an enemy to progress, and misrepresented as a foe to the Alkaline Toning altogether. Such is far from being the case. I expressly state that the process has so many advantages that, if it be only as stable as the older process, it would be universally used. I have my doubts on this point, and neither your remarks or any other that I have seen convince me that I am wrong in recommending close watching of the prints to see if they be as stable as we hope they may prove. What the points are which have been "satisfactorily settled" on which I throw a doubt you do not say; but I would remark that as those who have experimented most largely on the subject are still not agreed as to the exact composition of the image to be toned, the theory of the action of any toning bath on that image cannot be "satisfactorily settled." Again, in Mr. Hardwich's *Photographic Chemistry*, page 159, I find these words:—"The ordinary plan of fixing and toning in one bath has been *proved to yield permanent prints* if proper precautions are observed." This is stronger language than any I have used about the permanency of prints: if it be true (and I believe it to be so), what other process can do more as far as stability is concerned? Yet we find this process abused as the author of all the faded photographs and yellow skies in existence. It is against this abuse of an old and tried process (simply because a new one has been brought forward which is by some people considered theoretically more correct), that I wish to protest. Now, with respect to the special points mentioned in your remarks, I can only go with you to a certain point. I quite admit that a well-prepared bath contains the double hyposulphite of soda and gold, hyposulphite of soda, and, in the bath, as I recommend it, soda. Now, perfectly to understand the action of this solution on the print a *perfect* knowledge of the nature of that print is necessary, and this we do not yet possess; but I can by no means admit the necessary formation of sulphide of silver, which in your explanation you take for granted, if the action be between reduced silver, as you state, and the double hyposulphite of soda and gold. Under such circumstances why may there not be a single interchange of bases? Gold being deposited and soluble hyposulphite of soda and silver formed. That a deposition of gold without any liberation of sulphur takes place when pure silver acts in sel d'or, or on a properly prepared mixture of chloride of gold and hyposulphite of soda, seems certain from the process of gilding a daguerreotype plate, where the plate, after being treated with hyposulphite of soda and well washed, is warmed in a solution of sel d'or, and becomes covered with a film of gold, but without any formation of sulphide of silver, the smallest trace of which would effectually spoil the picture. You next say that "if a print be first fixed in hyposulphite of soda it cannot be afterwards toned in sel d'or." On this point doctors differ. In 1849, Le Gray published a process of toning by sel d'or in which he directs that the prints, *after being fixed in hyposulphite of soda*, should be floated on a bath of sel d'or, five grains to the ounce, when fine velvety tones would be procured. This process I tried in 1851, and found I could tone prints to a black colour, even after they had been washed and kept dry for some weeks after fixing. Its action was, however, a little uncertain, and the tones rather too blue. I have some of these prints now, perfectly good.

With respect to time being an important element in chemical changes, it is just because I think so much of its importance that I say—Watch your prints. I have prints by the dozen, toned in the double hyposulphite bath, which have for nine or ten years been subjected to all fair and much unfair usage, without showing any symptoms of fading, even a sojourn in New Orleans having failed to give them "yellow fever." As much cannot be said for any alkaline-toned prints, simply because none have been so long in existence. While quite admitting that the tests to which you refer give strong reason for expecting the permanence of

prints, I cannot admit them to be as good evidence as the exposure to all ordinary accidents for a number of years.

You next deny my assertion that, in the alkaline process, the pores of the paper, when it goes into the hyposulphite of soda, are filled with a mixture of chloride of gold and carbonate of soda, because the proof is well washed before being placed in the fixing bath. If any one washes his prints so perfectly as to remove all the solution from the pores of the paper, of course the remarks founded on this one point are not applicable to his prints; but such washing is certainly not the rule. Mr. Hardwich says—"Wash them *for an instant* under a tap;" and I know many photographers who do not wash them at all. My own practice has been to wash them for much more than "an instant;" but I think, if such an elaborate washing be necessary as is required to remove the whole of the toning solution from the pores of the paper, it will go far to bring the process into disrepute; and so long as any remains the decomposition between it and the hyposulphite of soda must be the same in the paper as in the older toning bath—with this difference as regards the print, that, in the bath, the precipitated sulphur, if any form, is filtered off, while, if it form in the paper, there it remains. The different condition of the image may, to a certain limited extent, modify the deleterious action; but, as all experiment shows that there is still silver in some shape in the prints, it cannot be altogether different. One remark, and I have done. It is customary, in speaking of the alkaline process, to call the gold bath the toning, and the hyposulphite the fixing bath, as if the only action of the latter were to dissolve out unchanged chloride of silver. If such were the case why cannot ammonia be substituted for the hyposulphite of soda, and so the very presence of any sulphur compound throughout the process be avoided? The answer is, that the colour of the prints would not be good. In fact, toning strictly takes place as much in the hyposulphite as in the gold bath. To what is this toning due? To something more than the mere removal of unchanged chloride of silver. Mr. Hardwich, I observe, says that the fixing bath may be kept for many weeks, and gives a slightly improved colour when it has been much used; that is, when there has been time for decomposition to set in between the hyposulphite and the dissolved salts of silver. This seems to me rather like a return to sulphur toning than going farther from it. In no process would I risk the use of an old bath. In conclusion I would say that I wish all success to alkaline toning; but success is not attained by shutting our eyes to the weak points of a favourite process, and I repeat that seven or eight years hence we shall be in a better position to form a correct judgment on its superior stability.

PHOTOGENIC TRIBULATIONS.

RECITATIVE.

Soul of the universe! oh, hear our prayer!
Drive not thy suppliant vot'ries to despair.

CHORUS.

Bright orb! send forth thy rays.
In floods of splendour, god arise!
Dispel the storms, ascend thy skies
In one effulgent blaze.

Virgins of the Sun.

PROFESSIONAL photographers are a badly-used race. Some one has always a stone of abuse to add to the already large heap. The sting of satire exhausts its venom on their works. The stroke of wit descends sometimes not too gently on their efforts. But the novelty of all this has passed away, and the once unaccustomed ridicule falls more lightly upon its victims.

The esteemed conductor of *All the Year Round* makes it to be an apparent necessity of all whose lot has fallen in the desert of London out of season, that they should get themselves photographed; and it certainly is difficult to escape the wiles and temptations held out in this direction in that great city. Photography is everywhere—"*rampant, regardant, passant;*"—and if you seek refuge at the seaside you do but flee from Scylla to Charybdis, and are continually invited to "walk in and be done."

One occasionally meets with people to whom the Exhibition of 1851 is only a matter of hearsay. There are even travellers in Spain who have not seen Madrid. One day, last autumn, while walking, camera in hand, on the lofty cliffs of one of our favourite resorts, we met a man who, *mirabile dictu!* had not had his portrait taken. Here was a curiosity, indeed! We looked at him with astonishment while he told us that he had resisted generally the blandishments of the professional world, and particularly those of his brethren, and even those of his cousins. What self-denial in an age like this, when every parish vestryman lives in hope of a testimonial to himself of his own effigy, together with a silver teapot for Mrs. P. V.! But there the man stood, a likely person enough and well-favoured, but with blue eyes and sandy locks withal, which would not delight a photographer; and we had to enlighten his ignorance as to the mystery of our own proceedings, and sent him home musing about the solar spectrum, actinism, and the like. When we hear of officers of the line and their volunteer compatriots being "taken off" by the dozen, and even social societies, such as the Harmonic Brethren, handing down their images to posterity, such an instance as we have quoted must be a rarity indeed.

We do not know what Mr. Wall will say, but we incline to the opinion that photographers are scarcely responsible beings. We are strengthened in this heresy (it may be) by a thing we met with the other day, and which, acting on the Cape'n's advice, we made "a note of." A small man and his huge wife wanted their portraits taken in a group, probably to show that in life at least they were not divided. The lady, standing at her lord's side (the master was sitting), completely overwhelmed her better-half by her matronly proportions; and when another plate was tried, and the situations reversed, the lady appeared sitting upon a comfortable *chevaux de frise* of letter V's, which formed the marginal device of her extensive flounce. What was the poor photographer to do? He was clearly not responsible for this. It was not for him to put asunder what had otherwise been joined together; but in no way could he produce either to our mind or his own a presentable group.

People *will* get into their pet attitude, which, perhaps, after all, pleases their friends, and perhaps pays the artist: so that we ought not to grumble. But we want to alter prevailing tastes. We want to see fewer young ladies languishing at the memory of imaginary lovers. We are tired of aldermen sitting at immortal tables, with one hand in their purse pocket. We got immensely tired once of a smuggler whose figure, looking through a casemate in a sanguinary manner, stared us out of countenance wherever we turned; and we are now equally tired of weird figures of young men (who have apparently been out all night) drawn on backgrounds of cerulean hue. Why do not artists take up some work of art—Hogarth, for example? There are figures in the *Marriage a la Mode* which cannot be improved upon; and the "conversations" of his time might be revived on paper well enough. But there are objections to this; and though it might be quite appropriate in one sense, one would not like to be figuring as *Thomas Rakewell*, nor as the matrimonial hero before alluded to, while other objections will constantly present themselves: so it is a matter of extreme difficulty to an artist rightly to pose and arrange his sitters, and it is too bad to blame him for all the miserable results one sometimes meet with.

We have seen some portraits slightly printed on ground glass, and then coloured. These are very effective, and might be good substitutes for the present fashion. We saw some at Llandudno, by an artist who has also a place in Liverpool, of which we approve very much. A short time ago we were shown one coloured by an amateur, who had contrived to make it as unlike the original as he could; but taste differs much in this particular as in other matters.

There are a thousand and one difficulties in the photographic pathway. Thorns spring up on every side, and the artist has need of a patience like that of the patriarch of old before he can meekly put up with and succumb to them all. Did the reader ever spend an hour behind the background screen of a studio, and play Dionysius to those on the other side? If he has, it is not needful that we should reiterate what has echoed in his ears—criticism the most unkind and inappropriate, compliments of a most questionable kind, complaints of a pecuniary character, come as a matter of course, apparently, from visitors. We sometimes think the situations of the studios is the cause of this. Mounting up six flights of stairs is at all times unpleasant, and seems to have a bad effect both on the lungs and temper of its victims. It is not pleasant to walk into a mousetrap even for the sake of the cheese; and too many look on it in this light.

Well, then, the weather has a great deal to answer for; and last year above all others has been the worst since it lay in everybody's power and means to have his or her portrait taken. *Nulla dies sine linea* may suit the academy; but old Phœbus Apollo forces many such days on the photographer, and the public do not all think of this. So long as it does not rain (that touches their own convenience), so long they think the actinic influence may be successfully invoked on their behalf. Photographers themselves err, we think, in the other way, and so lose many days; but this has its blessings also, and a cessation from toil may prove of much good, as it generally does. The spider that always spins never catches flies, and will starve in the long run.

But we have not done with photographic difficulties, and for the present commend to our readers the passage which has been placed at the head of this article as being peculiarly appropriate to the last season.

While discoursing of photogenic troubles, we may be pardoned, perhaps, for a slight reference to those we have recently got into

ourselves. On reference to a recent report, we find we have inadvertently attributed to our friend Mr. Wardley what another friend of ours (Mr. Rogerson) said; but though this correction, in fact, is called for, we do not think we erred much, as what is reported of Mr. Wardley is the same in spirit, though his *ipsissima verba* differ. So much for the charge of inaccuracy. As for that of wrong motives we do not care to notice that, except to say that, if a writer cannot escape it because he chooses, like the Veiled Prophet, to remain unknown, "'tis a pity, pity 'tis 'tis true;" and we are content to bear it along with the still unknown Junius whose name has been imported into the discussion. Σ

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. III.

After seeing Mosta, I did not think the cathedral at Citta Vecchia so grand as I might have done, notwithstanding its gilded and fresco-painted ceiling, its many-coloured marble pilasters, gorgeous marble altar, and real silver services.

Boom! go the guns of H.M. ship "Agamemnon," reminding me as I wrote that I was under the protection of some ten or a dozen of the largest of our wooden walls. No fear of forgetting that there, though; for one saw sailors everywhere. Rare sport "Jack" makes, too. He is fond of being mounted; and such a row he makes on horseback! The Maltese, whose horses they hire, are generally good runners, and manage, by keeping up with the tars, to save "Jack's" neck and their own horseflesh. One day we saw one deliberately trotting behind, and while the sailor belaboured the beast, and spurred and kicked, the owner by twisting and pulling the horse's tail managed to "steer" him through the crowd of amazed passengers.

The city of Valetta, from which I write, and which, as the seat of government and harbour of the island, is the chief or capital city, is built on a narrow neck or strip of land, about half a mile broad and less than two miles long. On one side of the city is the quarantine harbour; on the other, the naval and merchant harbour—both very fine and safe roadsteads, and both, I believe, perfectly protected by the many forts which are planted at the entrance and on every point which commands them. The city, as a whole, looks quite European, though there are several features which are peculiarly Eastern. A large extent of dead wall, a great scarcity of windows, and still greater scarcity of glass, are prominent characteristics. The roofs are all flat and paved over, affording a fine terrace for enjoying the evening breeze and a view of the surrounding country. The shops are decidedly peculiar. There is no window, and the door is the full breadth of the shop, or nearly so—not a very convenient arrangement for those businesses which have work to do. Tailors and shoemakers, in order to see to work, sit at or outside the door, and pursue their stitching vocations. The same with other trades. The temperature being so mild, the Maltese do a great deal in the open air. I think them a fine people—faithful and honest, tolerably industrious, and able to endure a great deal of fatigue. It is rather singular they are not a richer people. But I do not think they are ambitious, or fond either of wealth or power. They seem better suited for servants than masters. In the former capacity they have a name over the world as the embodiment of obedience, faithfulness, and reasonable industry. As a people they are vain in a high degree, and immensely fond, in consequence, of jewellery and gaudy ornaments about their persons.

Their incapacity for government, as a nation, may almost be held established in the fact that in no case have they ever even aspired to it, though they have changed masters times without number since they bowed to the Phœnicians, more than two thousand years ago. They now willingly submit to the mild government of her gracious Majesty. It would be difficult to relate all the changes of masters they have had. The "Knights" alone have left numerous and decided mementoes of their government, and are by all allowed to have ruled well. This city was designed and, in great part, built by one of the grand masters of that order, La Vallette. For nearly three hundred years the island was the abode of this embodiment of the chivalry of Europe. In the church of St. John of Jerusalem, in the centre of the city, lie buried the knights and their squires. The whole floor of the church is covered with the monuments, which form a kind of Mosaic pavement.

Photography has found two creditable professional representatives here, and I believe numerous amateurs. I put out my baths the other day, and took a few views of the streets and more prominent public buildings of Valetta. In a few days I purposed taking a trip to St. Paul's Bay, in order to carry off a memorial of that interesting locality. The water in Malta I found extremely hard, causing a dense deposit of silver salts in the washing waters. That, however, I knew would do no harm whatever. I had been accustomed always at home to use the ordinary water for all purposes. When I came to the development in Malta, I found it very difficult indeed to get on. The amount of silver I had been accustomed to add to the developing solution I saw was precipitated, and found, on applying it to my plate, that there was no image appeared, though I was confident it had been sufficiently exposed. I procured distilled water, and with it proved that everything else was right but the water. I could not, however, make up my mind to use distilled water all through my intended journey for that purpose, as I had no means of distilling it myself, and I felt confident there would be no other way of obtaining it in Syria. By adding a considerable quantity of silver—five or six times as much as I had been in the habit of doing—I got good pictures, using the ordinary spring water of the country. Strange, the rain water which was in the "well" of the hotel I lived in I found extremely hard, from the lime on the house-tops, and also the lime-lining of the well itself.

An observable feature in Maltese houses is the balcony. It is similar to what is sometimes seen at home; but at home the balcony is generally only a railed-in space outside the window. The Maltese one is quite enclosed, and reaches to the top of the window, and often extends along the whole front, taking in two or three windows, and is all glazed. It projects a good deal; and in this quiet retreat, sheltered from the sun by blinds, and from rain or wind, the Maltese dame enjoys the luxury of observing what passes below all along the street. In our climate it would shut out the sun too much from the rooms, as all the light has to pass through these balconies; but everything there seems to aim at making the dwellings as cool as possible. Just now the temperature is not high; though, bordering on seventy in the shade, it is warm enough to a Scotchman.

It was pleasant, though, to look on the yellow waving corn, and think it was ripe in the end of April; and pleasanter still to have been eating ripe strawberries for a fortnight. Tropical plants grow there, though I believe the palm-tree barely grows, giving a thorough oriental feeling to the landscape. I was disappointed with the orange-tree: I was told it would look better a few months afterwards. There were very few leaves, and the large yellow fruit seemed stuck-on like. The cactus, or prickly pear, was there everywhere abundant, and was very observable from its peculiar character. I was assured I should enjoy its appearance more on my return, when the fruit was formed and ripe. Medlars I saw yesterday in abundance, and was assured they were ripe. I thought them sour: perhaps that is their best taste.

After the grain crop is removed, I believe the Maltese farmer grows a crop of cotton. I shall see that for the first time on my return in autumn. Another crop, I was informed, follows the cotton.

There is scarcely anything of national peculiarity in the dress of the Maltese, except in the head-dress of the women. The "onnella," which is at once a covering for the head and shoulders, is not unlike what prevailed in Scotland forty years ago. It is usually made of silk, and has a piece of whalebone sewed into it, which makes the cloth stand out from the face, and forms an arch over the head; the left arm is covered by the habit, and the right hand is used to hold it together. The hands so placed, and the mild, resigned-like looks of the Maltese ladies, give them the appearance of nuns or religious devotees, especially as they are so often going to and from church.

The whole population seem very great church-attenders. Every hour in the day, and every day in the week, you find crowds hurrying into their places of worship. I would say they are a religious people. Pity they are not blessed with a more intelligent religion!

There are no manufactures there, nor, indeed, any commerce. It is a large victualling-yard for the navy and merchant service. The government seems to be the principal employer. The climate, I suppose, is healthy. I understand many invalids go there in search of health; many, no doubt, to find a resting-place in the little cemetery at Floriana. I should think Malta is disposed to make one bilious; so those so disposed had better not go there. The people are very highly bilious in temperament, no doubt produced by the soil or climate, or both; and during my short stay there I have seen enough to convince me that new-comers feel the influence. The good-looking among the Maltese are, I think, beauties; but that is the exception. As a rule, they are spare and hard-featured; and the children never being chubby, but thin and hard-muscled, are

either ugly or unchild-like—at best, miniature men and women. Sometimes one lights on a pair of glorious black eyes, which, if I were not a sworn bachelor, might produce fatal effects. As it was, I admired Nature's workmanship, and passed on.

During my stay I went to St. Paul's Bay, which tradition has fixed on as the place of shipwreck of the great Apostle of the Gentiles, while on his perilous voyage to Rome to have his appeal heard before Cæsar. This is about ten miles from Valetta, and an agreeable drive for a day. I took views of the bay, the "creek with the shore," into which the sailors "were minded if it were possible to thrust in the ship;" also of the "place where the two seas meet," where the ship was run aground. All went tolerably well with me photographically. The heat was considerable, but not such as to be either personally troublesome or materially to disturb my photographic operations.

I must now finish my very hurried, imperfect sketch of what I have seen and heard in Malta. I leave to-morrow for Jaffa, and in a few days more I hope to be in Jerusalem.

May 1st, 1860.

WHAT IS THE "ART AND SCIENCE" COMING TO?

THE following advertisement appeared in *The Telegraph* and *Lloyd's* newspapers:—

> TO PHOTOGRAPHERS.—WANTED a Young Man that understands the Photographing Business; one who understands the Hairdressing Business preferred.—Inquire at * * * * E.

We intend visiting the "establishment" in expectation of seeing a notice—

> YOUR HAIR CUT
>
> YOUR EXTERIOR PHOTOGRAPHED,
>
> AND
>
> YOUR INTERIOR REGALED
>
> WITH
>
> A GLASS OF "I'LL WARM YOU"
>
> ***FOR FOURPENCE!!!***
>
> *THE ORIGINAL ESTABLISHMENT.*

What next—and next?

In passing down a street in the neighbourhood of Covent Garden, one Sunday evening, we were startled by "A Blaze of Triumph," announcing that Portraits were taken *every* night "By the Electric Light." On arriving at the door a touter very politely requested us to "Step in and be DONE." We need hardly say that the Electric Light resolved itself into Moule's Photogen. H. S.

AUTOMATIC WASHING TROUGH.

[We copy the following letter, which has been addressed to the Editor of the *American Journal of Photography*.]

SOME time since you published a communication from me on this subject, and explained its action by a drawing, which was copied by THE BRITISH JOURNAL OF PHOTOGRAPHY, No. 128. In No. 129 of the last-named Journal appears an article, signed "William Church, Jun.," in which the writer asserts that the trough suggested by me "cannot be trusted to as self-acting, and it is not therefore to be depended on for the washing of prints to be left to themselves for a prolonged period." He also declares that "a siphon of four times the capacity of the feed-pipe, as spoken of by 'H.,' cannot *fill* except by help or accident," &c.

So much for conclusions; now for facts and figures—stubborn things.

In my article I stated that "care must be taken to have the siphon of capacity sufficient to run the water off very fast, at least four times as fast as the feed." I admit that it need not of necessity be four times as fast, but even at this rate it will act as mine does. In making that statement, I took a Yankee's undisputed privilege, that of *guessing* as to about how fast my own worked; and you will see by the time below given how near I proved true to my natural instincts. Being only an amateur, of course my box, or trough, is small, compared with that of some of our practical friends.

The box, or trough, measures inside two feet four and three-quarter inches long, thirteen and three-quarter inches wide, and eight and a quarter inches deep. Down through the bottom, and turned up *outside*, passes the siphon (not inside, as printed by you), made of lead pipe of three-quarter inch bore, and down again, as drawn to a point, nine and three-quarter inches below the bottom.

Now start the water, and in from seven minutes and forty seconds to eight minutes it begins to drip slowly from the lower end of siphon; in forty-five seconds more it begins to run a full stream; and in two minutes and fifteen seconds from that time the tank has emptied itself and is filling again; and so it will continue to operate just as the water flows with any degree of regularity.

Now, in conclusion, let us see how near the mark my guess was, as to the capacity of the siphon compared to the feed. With my tank full to the point of overflow, seven-eighths of an inch of the top, and water shut off, it empties itself in just one minute and fifty seconds (average time to fill); thus it will be seen that the overflow or siphon is *more* than four times the capacity of the feed. Perhaps my photographic brother, on the other side of the "big pond," will now give up his theory for my *facts*, and the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY will not have occasion for his very ingenious "frame balance valve" to make the "fixins" work. Having adopted the name given to my washing apparatus, by William Church, Jun., it being eminently correct and proper, and trusting it may meet with general approval and adoption, just in proportion as it is better than the "old fogey" contrivance now in use, I remain, yours, &c., H.

NOTES OF A PHOTOGRAPHIC YACHT VOYAGE IN THE MEDITERRANEAN.

By W. J. C. MOENS.

(*Concluded from Vol. VII., page* 370.)

ON Sunday we went through the torture of a Turkish bath, part of the process being to crack all your joints. It was most ridiculous to see a grinning demon of a Moor putting his foot against your ribs, and hauling with all his might, to crack the joints of your arm. After reclining on a divan, smoking a chibouque and drinking coffee, we engaged a carriage, and drove to Ghomart, twelve miles off, to pay a visit to Dr. Davis, who resided there with his family. The Europeans at Tunis considered it so dangerous that they were quite afraid to go and see them, and the Bey had sent word to him that he would not be responsible for their safety. One of their servants, Ali by name, confessed to Mr. Davis that he had committed no less than seven murders; but he was very much attached to the family, and would do anything for them. The figure on the extreme right in the group is the individual I refer to. We were received with a hearty welcome, and after dinner walked up the hill to see the catacombs, which were inhabited by hyenas and jackals. The next morning we took a picture of Ghomart and Mr. Davis's family, and late in the afternoon tried the Plain of Carthage, but it was too misty: the camera had to be pitched facing the south, so that it was only do-able in the very early morning or late in the afternoon. The next morning it was misty and rainy, so it was no-go for the plain. We started with Mr. Davis and the ladies for the village of Moalka, in a chaise and cart, in order to photograph the large cisterns there, a good many of which are turned into dwellings. When we arrived there it was raining, so we took shelter in one of the cisterns, and erected the dark-box, and between two showers managed to do the work: the camera was pitched on the top of an old wall, in a most difficult position. While I was developing a plate the camera was again blown over by the wind, and was only saved from utter destruction by my friend, who was standing by it, catching by one of the legs. I heard all the party call out, and guessed at once what was the matter; but I continued developing, and, on emerging from under the black cloth, was told it was all right, which greatly comforted me, for I had imagined it had been dashed all to pieces. We then proceeded to the ruins, and, after lunch, took a stereoscopic picture of the Temple of Saturn, and in the evening returned to Goletta and went on board.

The next week we spent in a shooting expedition to Bezerta, leaving our cameras, &c., at Tunis.

On Friday, the 20th Jan. we started for Zoghwan, about thirty miles from Tunis, in order to take pictures of the noble aqueduct that used to carry water to Carthage. With great difficulty we got in the carriages to where it crosses the stream, in the centre of a plain about five miles wide, across which the stupendous work runs—not quite in a straight line, but a little in and out, in order to protect it more from the force of the wind We had some debate on the best position to take it from, and it was settled by taking pictures from two points. You can see from the copies I hand round the grandeur of the work, the piers near the river being built of stones about two feet high, neatly bevelled off at the edges. There are sixty-two rows of these, and in many of them you can see the holes in which the clamps were put to raise them by. Also you can notice one column built of sun dried bricks, by the Saracens, who did not take the trouble of restoring it in the same style as the rest. In another place the

top of one of the arches had been repaired with long Roman bricks. Aqueducts built with two tiers of arches are very rare, and this is a far grander work than the one in the Roman Campagna, which we saw some months after. The large pier on the right of the picture was in process of being blown up in order to make a bridge with the materials, so that my photograph was the first and only one that would ever be taken of it. The figures on the other side of the river are the American Consul at Tunis and his dragoman, who had gone to shoot a fox that we had seen just before.

We left at twelve for the ruins of Udina, an old Roman town, where the cisterns, amphitheatre, and stables capable of containing several hundred horses, are very perfect. An old Arab we met on the ruins moralised on them, and said:—"Look at these old ruins: who knows what people built them? What has become of them? and where are they now? Shall not we also pass away in the same manner, and those that come after us will know as little of us as we know of those that dwelt in this town?" We had not time to photograph, so we had dinner on the ruins, got into our carriages again, and arrived at the town of Zoghwan at half-past four. There were no roads for carriages, but we had to go over the country the best way we could—over the corn just sprung up, or through the bed of a river. There were three horses harnessed abreast in each carriage, and the drivers were Maltese, who always act as coachmen in this region: we paid about ten shillings a day for each vehicle, provender included. When we entered the town the Cadi was informed of our arrival, and he had to find a house for us, and to supply us with provisions, horses, and, in fact, everything we required.

The documents that the Bey had presented to us at Tunis enabled us to make all these demands from the head of the town. The next morning it was raining hard, to our great disgust. It was impossible for us to move out of doors, but at twelve it looked a little lighter; so we ordered a horse to be brought, with panniers, and we started for the ruins of the Temple, built over the place where the spring gushes out of the mountain. The water was conveyed to Carthage by the aqueduct from the Temple being on the side of the mountain, which towered some thousands of feet above it. There was some difficulty in finding a suitable place to take it from; but we found one on the other side of a ravine: this was some distance from where I had put up my dark box under cover, so I transferred my macintosh from my shoulders to my camera, and went back to prepare a plate. I had to give a long exposure. It was raining all the time, but the picture turned out pretty well. I then took two stereoscopic views from the top of an old arch which I thought would tumble with me all the time. It continued raining all day.

The next day the American Consul, who was with us, had a dispatch from Tunis to say that the Bey was going to be installed the next day, the firman having arrived from Constantinople the day before; so we returned at once, for it was a point of etiquette for him to be present. On Monday we went with the diplomatic corps to the Bardo Palace to view the spectacle, which was one of barbaric splendour, the whole road from Tunis to the Palace, about a mile, being lined with the troops, and about 8000 Arabs, all mounted on their own horses, who had come from the interior to pay homage to Si Sadoc, their new sovereign. After the ceremony they engaged in tournaments and all sorts of wild games.

In the afternoon we bade adieux to all our friends in Tunis, and returned on board. In the evening I tried to make some varnish, with some gums I had got in the town, and, to my great horror, upset the alcohol, which caught fire, and ran all over the cabin alight. We soon put it out, but it caused a great fright; for we were lying out in the bay, about a mile from the shore. All spirit operations by candle-light were interdicted for the future. I was in despair about varnish; for we had nothing but some nasty crystal varnish, that was not at all suitable for negatives. The next day we put all the printing apparatus in the boat, and rowed round Cape Carthage to Ghomart. We had some difficulty in landing, on account of the surf. We stopped here a week, for our friends would not hear of our going while the weather was so bad; so we spent the time in printing pictures, and taking portraits of ourselves, dressed in wild native costumes. I sent one of myself home to England, without saying who it was. It was not recognised till, in the next letter, I asked what they thought of me dressed as an Arab?

On Monday, the 30th, the weather was more moderate, and we sailed for Palermo, at about two o'clock, saluting our friends with two little cannon we had on board—they in return waving flags from the top of the hill. The next morning, by ten, we reached Palermo, having sailed about 180 miles in twenty hours.

STEREOGRAPHS.

Views in the Catskill Mountains and in the Highlands of the Hudson.

(E. Anthony, Broadway, New York.)

It is much to be regretted that out of a dozen slides now before us no more than four have any indication of their precise locality attached to them, nor even any numbers: so that it is very difficult, if not impossible, for us to indicate intelligibly those to which the remarks we would otherwise make would apply.

There are two slides of the Catskill Falls—one described as "from below." These present a very different aspect to the "falls" in the northern parts of our own island, not so much on account of their magnitude as of their surroundings; the geological character of the district of the American falls presenting a laminated structure, so that there is an absence of the roundness noticeable in the rocks of a different structure, over which a stream of water is continually passing. Of these two, one is a view taken from an elevation, where the waterfall is seen against a background of nearly still water of the lake below, which a little mars its effect, and in neither is the gauzy transparency of the falling water given with anything approaching the perfection with which Mr. George Wilson would have rendered it. But this is a a highly interesting slide notwithstanding, containing, as it does, a beautiful scene with which European eyes are generally unfamiliar:—a dense pine forest, growing quite up to the margin of the lake, the stems springing apparently from out the solid rock, and all faintly suggested again, rather than repeated by reflection, from the calm waters.

The Bastion Cascade in Catskill Mountain Glen is open to the same objections as regards the "fall" as the preceding, the water being far too opaque for artistic effect, but the subject, if fairly treated, would be a fine one.

Silver Lake, Catskill Mountain Top, gives an admirable idea of the solitude and repose of the locality, and is of a very simple character, consisting merely of a dense pine wood on the margin of a still lake. On the near bank two birch trees stretching over the water, with the peculiar light-coloured bark peeling off the stems, form a striking picture.

Of the *Highlands of the Hudson* we can say but little, for the reason already assigned; but several of the slides disclose expansive and beautiful views, including mountains, hamlets, and the noble stream of the Hudson river. Were these properly brought before the public, we have but little doubt they would meet with a ready and extensive sale—not only on account of their novelty, but for their real beauty also. We believe that Mr. Atkinson, of Liverpool, is Mr. Anthony's agent in this country.

Views of Coventry and the Neighbourhood, by J. Wingrave, *High Street, Coventry.*

Mr. Wingrave has been attempting to "kill two birds with one stone" in preparing the series before us: firstly to procure a supply of the most interesting objects in the vicinity of Coventry, wherewith to tempt visitors; and, secondly, to test the excellence of the various dry processes upon glass, which have been so abundantly brought forward of late. We perceive, on looking over the specimens, that the metagelatine process has been most in favour; and this is not surprising, as the best slides are amongst those printed from negatives taken by it. Of these we will mention a few:—

Grey Friars' Hospital, Interior of a Courtyard (No. 8), is a curious specimen of ancient domestic architecture, and was founded in 1529, as we learn from the label attached to the slide. The windows of the upper storey all look into the courtyard, or, to speak more correctly, the whole of the internal sides of the quadrangles are windows.

St. Mary's Hall (No. 15), without any pretensions to beauty, is still interesting to the local antiquary, and the slide contains also, apparently from its close proximity, a specimen of one of those wooden houses, with projecting upper storeys, so picturesque in a drawing, though obnoxious in a sanitary point of view.

The Reredos, St. Michael's Church (Nos. 100 and 101), are good illustrations of the great advantage of the stereoscope in reproducing, in a striking manner, the effect of sculptured ornamentation. One consists of an oblique view of four of the compartments, and the other of a front and nearer view of two of them: in both slides the several subjects treated in each compartment are plainly distinguishable.

Want of space will not permit us to do more than name two or three other specimens, without attempting any description, which, in fact, is scarcely necessary, owing to the subjects having been for a long time popular, as affording picturesque illustrations for various editions of Sir Walter Scott's works.

Kenilworth Castle, Cæsar's Tower (No. 82), Archway of the Great Hall (No. 88), Interior of Great Hall (No. 85), will no doubt be amongst the most popular. No. 84, another view of the Great Hall, being the best as a picture, will probably receive a double share of favour.

Nos. 67 and 103 are fairly executed interiors of Trinity Church and St. Michael's Church respectively, but do not present sufficient architectural or pictorial attractions to command more than a local interest.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible, we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they will forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.

No. I.

MOULE'S PATENT SELF-ACTING WASHING APPARATUS AND CHEMICAL FILTER.

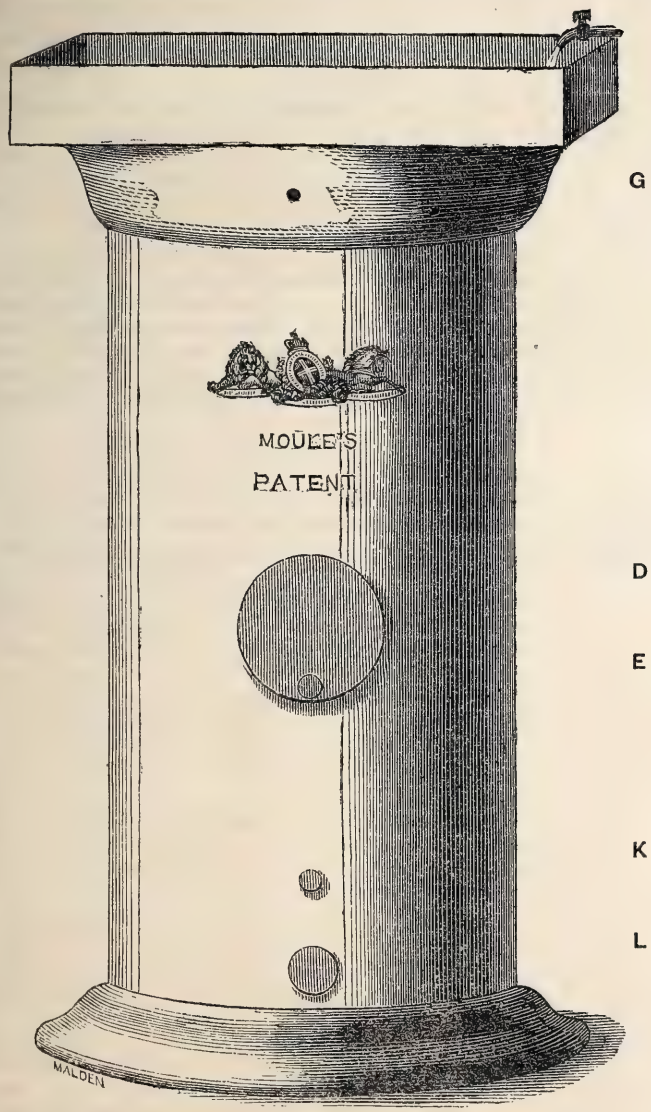


FIG. I.

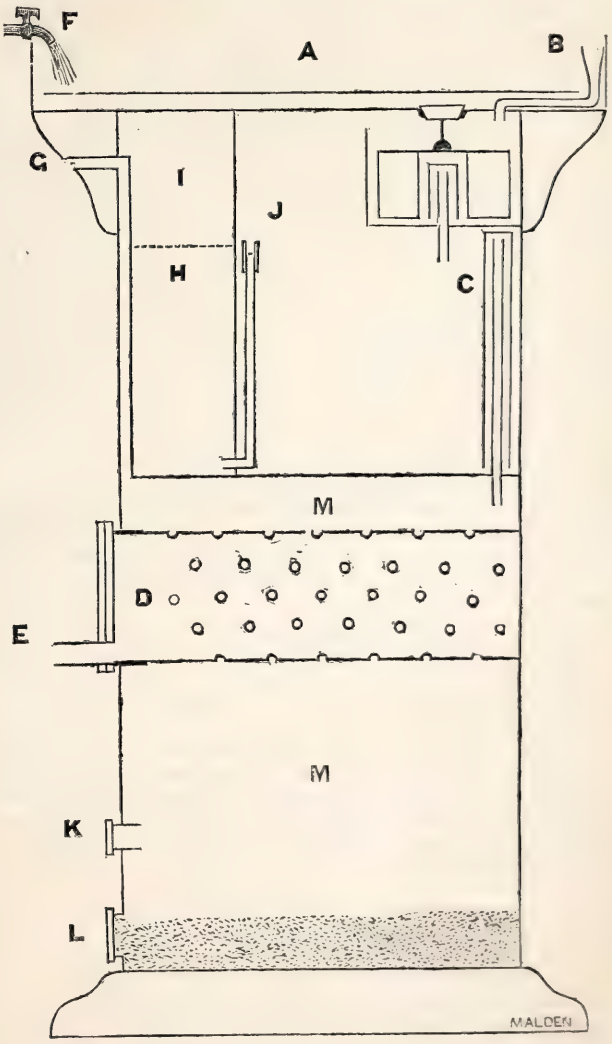


FIG. II.

In consequence of the recent discussion in the pages of The British Journal of Photography as to a practical form of self-acting washing apparatus for positive prints, Mr. John Moule has been induced to place his invention before the public rather sooner than this inclement season, so unfavourable to printing operations, would have encouraged him to do, though it was embodied in a patent dated June 16th, 1860, and entitled "*An improvement in the construction of self-acting apparatus for precipitating and collecting from solutions, metals, and their salts, part of which apparatus is applicable to flushing purposes.*"

All practical photographers are awake to the importance of an efficient method for thoroughly washing their prints, but it is a question whether all are equally convinced of the importance of recovering the noble metals from the washings, which, it is feared, only too often find their way into the sewers. A recent writer* has observed:—"There is an operation of no small money importance to the photographer, and in which a great deal of chemistry is involved, viz., the treatment of residues; and as it has been ascertained that of all silver used in the production of a print only five per cent. remains on the paper to form a picture, an easy and efficient process whereby the remaining ninety-five per cent. can be saved becomes a desideratum."*

The chief difficulty that has presented itself in the treatment of washings from photographic prints has been the large amount of liquid that presents itself in comparison with the amount of silver contained therein. To avoid the trouble and loss of time entailed by precipitating the silver, and afterwards decanting the supernatant liquor, these washings have too frequently been allowed to flow away. From personal experience of these annoyances, Mr. Moule was led to devise a self-acting arrangement that should

* *The Photographic Art: its Theory and Practice.* By James Martin.

* See also Hockin's *Practical Hints on Photography*, pages 94 to 102.

effect the necessary operations, and rapidly get rid of the excess of liquid after it had been thoroughly exhausted of every trace of the precipitated silver salt. The following is a description of his ingenious invention, and the method of using it. *Fig.* 1 is an external view of the apparatus; but it is to the sectional drawing (*fig.* 2) we must refer to make its interior arrangement intelligible. The prints are placed on the false bottom of the oblong washing trough A, which is supplied with water by means of the tap F. When the water rises to the height of the lip of the funnel of the waste-pipe B, it passes into "the float chamber" beneath; and, when this chamber is filled to a certain height, "the float" begins to rise, and, at the same time, it lifts the valve attached to its upper surface, which, when at rest, accurately fits a conical hole in the bottom of the trough A: this is in consequence emptied of its "washings," which, in the first place, pass into the float chamber, and ultimately (by means of an aperture in its upper part and a syphon tube covered by the float) into "the mixing chamber." As soon as a sufficient amount of liquid has accumulated in this to reach the top of the tube J, it passes down into the "salting chamber" H, and is there saturated with chloride of sodium, by means of crystals of that salt placed in a perforated compartment, I. As soon as the washings have accumulated sufficiently high to reach the top of the syphon C, and start the same, *a flush* takes place from the chamber H, and a part of its contents return charged with salt, and the mixture is then carried over into "the precipitating chamber" MM, by the action of the syphon C: here the chloride of silver formed settles to the bottom and accumulates, and the superabundant liquid is carried off, after passing through "the filter" D, by a waste-pipe E. This filter is formed of a perforated tube, filled with cotton wool and zinc filings, so arranged that any particles of unprecipitated silver salts that may have escaped the first attack may be reduced by the zinc and retained in the interstices of the wool. G is an air tube, which, however, may be connected with the developing sink, so that its drainings may be carried into the lower vessel M. K is a capped tube for drawing off the supernatant liquid, when it is wished to remove the precipitated silver salts through the stoppered aperture L. All the parts exposed to the action of the solution are constructed of a material that is impervious to water and the chemical action of acids, &c., and, therefore, not likely to readily get out of order. The frequency of the change of water in the trough B is regulated for any given interval of time by the adjustment of the supply by means of the tap F.

The compartment H, once charged with a saturated solution of salt, and rock salt placed on the perforated bottom I, is calculated to be sufficient to precipitate about fifty ounces of silver; and, beyond keeping the compartment I charged with salt, no other attention is requisite.

This apparatus is about two feet six inches high, and ten inches in diameter, and not by any means cumbersome in appearance.

Mr. Moule states that, independently of the prints being *thoroughly* washed without trouble or attention, he finds that the amount of solution which can be exhausted of every trace of silver is one hundred gallons in the course of a day.

Exhibition.

ARCHITECTURAL PHOTOGRAPHIC ASSOCIATION.

THE fourth Annual Exhibition of this Society was opened by a private view on the evening of January the 15th, when a numerous and fashionable assemblage of subscribers and those favoured with cards of invitation filled the galleries of the Architectural Union Company, at 9, Conduit Street, Regent Street, W. The collection for the present year comprises 488 photographs not previously exhibited, together with 81 sent in on former years. Most of the subjects have been selected according to the taste of the exhibitor; but others have been taken expressly for the Association, and these illustrate some special point of architectural interest. During the season, evening lectures will be delivered on *The Egyptian Photographs*, by Joseph Bonomi, Esq.; *The Photographs of French Renaissance Architecture*, by E. l'Anson, Esq.; *The Photographs of French Gothic Architecture of the 13th Century*, by R. P. Pullan, Esq.; *The Collection of Indian Photographs*, by James Fergusson, Esq.; *Architectural Progression*, by E. B. Lamb, Esq.; *The Grotesque in Art*, by J. P. Seddon, Esq.; *The Collection of Photographs Generally*, by W. Burges, Esq. Arthur Ashpitel, Esq., will also give a lecture on a subject not yet determined on. Those who may have recently visited the Exhibition of the London Photographic Society will not fail to mark the striking difference in the general aspect of the two collections; for, as a rule, the *picturesque* element is here, as might be anticipated, to a great extent wanting; nevertheless the photographs possess features of the greatest interest, and the excellencies of execution testify as to the valuable aid photographic delineations are capable of rendering to the architectural student; for, as Petit observes in his *Architectural Studies*, "The value of photography in conveying architectural character, combined with the most faithful accuracy of detail, is universally recognised. It is applicable both to general outline and minute ornament." The productions of each exhibition are grouped together, but are subdivided as to size.

We will proceed to notice the productions of the principal exhibitors, in the order in which they stand in the catalogue. Bisson contributes a fine series of sixty-five photographs, varying in size from 25 by 20 to 14 by 12 inches, comprising general views, together with the details of continental cathedrals and other public buildings. Of these we may draw attention to *The Tower of St. Jacques de la Boncherie at Paris* (No. 1), which, however, would be improved as a picture if the mass of white sky surrounding the shaft of the tower above the houses were broken up, after the manner Mudd has now accustomed us to. *The Tympanum of the South Portal of Notre Dame* (No. 4) represents a quaint sculpturing of the martyrdom of St. Stephen. No. 6 is a large and effective view of *The Principal Entrance to the Palace of Industry.* The well-known *Place de la Concorde*, and that magnificent pile of building, the *Hotel de Ville, Paris*, are finely rendered in Nos. 7 and 8. The *West Portal of Rheims Cathedral* (No. 9), and the *West Front of Rouen Cathedral* (Nos. 13 and 14), attract attention, together with the *Palais de Justice* (No. 19) of the same place. The *Staircase of Francis I. at the Chateau de Blois* (Nos. 27 and 28), the interesting *Byzantine Doorway, Bourges* (No. 33), the *Details of the Portals of Chartres Cathedral* (No. 36), the quaint *West Front of Notre Dame, Poitiers* (Nos. 44 and 45), the *Doors of Rouen Cathedral*, carved by Jean Goujon (No. 50), the *Hôtel Bourgtheroulde*, of haunted aspect (No. 56), and the *Groups of Antique Sculpture in the Palais de Beaux Arts* (Nos. 59 and 60), all possess features of archæological interest. Nor must the *Roman Theatres at Arles and Nismes* (Nos. 21, 22, 40, and 41) be overlooked.

Legrey contributes four views from the tympanum of the portal of Notre Dame, Paris (Nos. 66, 67, 68, and 69). One of these represents a quaint sculpturing of *The Last Judgment*, and the last a detail of grotesque character representing *An Angel holding a Balance*, with a praying figure in one of the scale pans weighing down a devil in the other, whilst the arch-fiend, with greedy eye, is watching the important operation, and an attending demon is attempting to turn the beam in his master's favour by hanging on to the side out-balanced. A file of kings, counsellors, knights, priests, and queens, who have passed the scale and been "found wanting," are chained together, like a gang of dockyard convicts, and politely attended on by demon warders, who are pushing them on to a warm reception-room.

W. Nichols exhibits views of the Cambridge colleges, the best being that of *The Fitzwilliam Museum* (No. 74).

Messrs. Cundall and Downes exhibit forty views in England, France, and Spain. No. 91 represents the engineering works of the *Albert Bridge at Saltash.* Nos. 92 to 99 are photographs of *Winchester Cathedral.* No. 93 is particularly free from distortion, showing the *Interior of the Nave, looking West. The Triple Arch, Saint Cross, Winchester*, and *The Old Well, Alnwick Castle*, are of archæological importance. No. 103 is a pretty vignette view of *St. Paul's Cathedral from the River*—in fact, one of the best photographs we have seen of that noble pile. *The Grand Entrance to the Palais de Justice, Rouen* (109) again presents a subject that attracts attention.

Barnes exhibits two neatly-executed views, the subjects being King's College Chapel, Cambridge, and the Patriotic Asylum, Wandsworth.

R. Gordon's views of antiquities in the Isle of Wight next present themselves, the best being that of *Yaverlund Church.*

Tyley exhibits two views of Bristol Churches.

Frith's Egyptian views, 31 in number, are one of the features of the present Exhibition. No. 144, giving a distant view of *The Island of Philæ*, is a picturesque subject, showing a curious stratified appearance in the shallows of the rivers towards the foreground. *Pharaoh's Bed* (145) and *The Details of the Columns* (146), and *Colossal Sculpture on the Pylon of the Structure* (147), possess considerable interest. *The Ruined Roman Arch on the Island of Biggeh* is as picturesque from a photographic point of view as it is

attractive from an archæological one. *The General View of the Temple of Soleb* (151), and *The Details of the Pylon and Columns* (152-153), claim attention. From being above the sixth cataract of the Nile, this is seldom visited by Europeans.

Mr. Moens contributes a unique collection of photographs of the ruins of Carthage, being those described in his "Notes of a Photographic Yacht Voyage in the Mediterranean" that have lately appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY. These include *The Cisterns at Moalka; Cisterns at Carthage;* views at Zoylievare, showing *The Ancient Aqueduct to Carthage* (Nos. 159-159); and *The Temple* at that place over the spring of water. *The Gate of Lions, Mycena; Temple of Jupiter, Egina;* and *The Temple of Minerva, Sunium*—are perhaps the most noticeable of the seventeen photographs exhibited by this gentleman.

Dr. J. Murray contributes twenty photographs of Indian subjects, all of which possess great interest; but we would call attention to No. 168, *The Gateway of the Gardens of Secundra;* 173, *The Great Temple of Bindrabund*; 174, *The Taj;* 176, *The Fort at Agra*—a fine group; and 182, an unnamed subject, representing a temple-like group of buildings, with a curiously carved low wall advancing from the centre of the picture to the left side of the foreground.

Mr. Annan has sent in ten views of the antiquities of Iona: *Mac-Lean's Cross* (187), *The Doorway of St. Oran's Chapel* (188), *The Burial-place of the Scottish Kings*, being those that first fix the attention. He has also given one of the best general views we have seen of Edinburgh, looking towards Calton Hill from Holyrood.

Roger Fenton exhibits twenty-four fine views of Furness Abbey—206, 208 *(Norman Arches)* and 211 being the most to our fancy—*Southwell Minster, Harewood House from the Parterre* (224), and *Kirkstall Abbey* (225). The last, however, is of a gloomy, inky tint, being the most marked of a style Fenton has adopted this season, we presume to avoid the defects of the much-decried white paper skies. The treatment of his subjects is, however, always artistic.

Bedford contributes seventy photographs, inclusive of twenty-nine subjects taken expressly for the Association. This collection includes some fine cathedral interiors, marked by the rich tones and the exquisite rendering of the lights and shades that characterise the productions of this artist in the treatment of such subjects. The wrought-iron work and the Grinlin Gibbon's wood carvings in St. Paul's Cathedral present subjects of interest. *The Excavations at Wroxeter* (227) arrests the attention of the archæologist. Salisbury, Bristol, Wells, and Exeter have furnished ample material for Mr. Bedford's camera. The subjects taken for the Association comprise architectural details or general views of Rivaulx Abbey, Tintern Abbey, Whitby Abbey, York Cathedral, Fountain's Abbey, Ripon Minster, Chepstow Castle, Raglan Castle, Carnarvon Castle, Conway Castle, Barfreston Church, and Canterbury Cathedral.

Delamore and Bullock exhibit subjects from Ely, Iffley, Cambridge, and Oxford—the most interesting being those of the interior and details of the New Museum at Oxford: Nos. 328-9-30, show the fretwork of the elegant iron arches that support the roof of that building. S. Thompson also exhibits some good representations of the same building, which has lately attracted so much attention; but we are surprised that in neither of these collections are to be found *details* of the capitals of the marble columns, which are sculptured with novel designs from Natural History subjects, by local artists, as these excited considerable interest among the visitors at the recent meeting of the British Association at Oxford.

Captain Austin contributes some admirably-rendered *Interiors of Canterbury Cathedral*, quite worthy of a professional photographer.

Mr. Church, jun., sends some interesting views of various parts of Glasgow Cathedral. Irish Antiquities find their representor in Dr. Hemphill, *The Round Tower at Cashel* giving a good idea of those peculiar constructions.

Mudd gives perhaps the most picturesque treatment of an architectural subject in the exhibition. *Goodrich Castle* (417) is, we think, one of the gems of the collection. His subjects are from Lincoln, Roslyn, Linlithgow, Edinburgh, Fountains, Tintern, Raglan, Chepstow, and Worsley, Lancashire.

Frost contributes views of *Beaulieu and Romsey Abbeys.*

Cocke confines himself to *Exeter Cathedral.* Nos. 435 and 437 are the best by this excellent photographer; but the last view is somewhat marred by the Punch-and-Judy-looking "tent" putting in too prominent an appearance beneath the noble Porch of the Tower of the Cathedral.

The Terrace at Sir W. F. F. Middleton's, by Cade, is a fine subject, well treated, and taken expressly for the Association.

Captain Dawson contributes some interesting views of Indian structures, amongst which we may specify *The Pagodas* and *Horse Court at Seringham*, and those of *The Rock at Trichinopoly* (Nos. 463, 464, 465). *The Bridge over the Cauvery River* (460), with its vista of arches across the broad stream, strikes one as a remarkable engineering work in such a country.

Captain Henry Dixon contributes a numerous series of peculiar interest of the Rock-cut Caves of Orissa, and the curious structure of the Native Temples at the same place, together with two views of the great Temple of Juggernaut at Pooree.

The entire collection presents numerous features of varied interest, whether the visitor be interested in archæology, architecture, and engineering works, or not, and is well worthy of a visit from those wishing to mark the progress of photography in its various applications. S. H.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at St. Peter's School Rooms, Walworth, at Eight o'clock on Thursday Evening, the 17th ult.,—the Rev. F. F. Statham, the President, in the chair.

Mr. WALL, the Secretary, read the minutes of the last meeting, which were confirmed. He also announced the receipt of a very interesting letter from Mr. Bailey, relating to Mr. Hooper's waxed-paper process, and considered it would be advisable to place it at once in the hands of their Experimental Committee, who had appointed a sub-committee to make experiments in that direction. He also read a letter from Mr. Bolton, in which he claimed the honour of being the first and, up to the present time, the only person who had succeeded in producing photographs on wood blocks that could be engraved therefrom by the ordinary wood engraver. He had further to announce the appointment by their managing committee of a sub-committee, authorised to select from the Photographic Exhibition in Pall Mall their presentation photograph. Mr. Simpson had presented to their library copies of the *Year Book of Photography* and his *Photographic Teacher*. The future meetings of their committee would be held at his (Mr. Wall's) Studio, instead of at 90, Cannon Street, City, as heretofore.

A vote of thanks was passed to Mr. Simpson for his present to the Society's library.

The CHAIRMAN thought the Society was not in a position to offer an opinion as to Mr. Bolton's claim to priority in the successful application of photography to the requirements of the wood engraver. He wished to call the attention of the members to some very successful specimens of photo-lithography, executed by Mr. James Contencin.

Mr. BURR, F.R.A.S., had been invited by Mr. Wall to offer a few remarks *On the Application of Photography to Astronomy, Magnetism, and Meteorology.* In consequence of his time being so much occupied, he had been excused drawing up a formal paper upon the subject, and, therefore, he must beg them to pardon any shortcomings he might be guilty of, more especially as he should be most happy to answer questions upon any points where he might not be sufficiently clear and explicit. He must premise that he professed but a small acquaintance with the principles of photography, and even still less with its practical details,—although he had made a few attempts to obtain pictures of the moon by its means. He would proceed, in the first instance, to trace the application of photography to astronomy in a historical point of view, and he would then give them an account of the various ingenious methods and contrivances whereby such successful results had been obtained by the celestial photographer of the present day. The first picture of the moon taken by means of photography, that he was aware of, was a daguerreotype taken by Mr. Bond, of the Cambridge Observatory (United States), assisted by Messrs. Whipple and Black, and sent among other American curiosities to the Great Exhibition of 1851, when it was also shown at one of the meetings of the Royal Astronomical Society. It was obtained by means of a refracting telescope of fifteen inches aperture — probably the finest in the world. The picture was very perfect, Mr. Archer having introduced collodion into photography in that year. Mr. De la Rue applied it to celestial photography in 1852, and by means of his large reflecting telescope, of thirteen inches aperture, produced photographs of the moon one and a-half inches in diameter, which were exhibited to the Royal Astronomical Society in 1853. At that time Mr. De la Rue had no machinery for driving his telescope, and was assisted by Mr. Thornthwaite in making it follow the course of the moon by hand. In consequence of the difficulties to be surmounted, Mr. De la Rue ceased his attempts until he succeeded in 1857 in making a driving clock. In 1853 Professor Phillips, then residing at York, succeeded in taking photographs of our satellite with an eleven-feet refractor telescope, of six and a-quarter inches aperture. The process was very slow, and, although he was provided with a driving clock, the pictures were not sufficiently sharp. In 1854, Mr. Hartnup, of Liverpool, assisted by Mr. Crookes, produced some very good pictures of the moon with an eight-inch aperture telescope; and since that year Professor Secchi, of Rome, working with a telescope

of nine inches aperture, and Mr. Fry, of Brighton, with a refracting telescope of nearly seven inches aperture, and Mr. Huggins, of Tulse Hill, with an instrument of ten feet in length, and eight inches aperture, have prosecuted their labours in that direction. The latter works with a little camera screwed into the eye end of the telescope, with a back of the ordinary description, containing the collodion plate, and with a part of the draw-tube graduated to tenths of an inch, for the purpose of noting the exact focus. Mr. Fry uses a graduated board and screw adjustment for the same purpose. [Mr. Huggins's camera and negatives were exhibited to the meeting.] All the gentlemen using refracting telescopes, which were only corrected for perfect achromatic vision, experienced great difficulty in consequence of the difference between the position of the actinic and visual foci, but reflecting telescopes were not open to that objection. In 1857 Mr. Bond sent to this country a collodion photograph of the double star Mizar in the great bear's tail of very sensible magnitude, and so sharp that, by the application of a delicate measuring apparatus, the distance between the two components of the star and their relative position could be accurately ascertained. The same gentleman also exhibited a photograph of the star Vega, crossing the field of his transit instrument. The track of the star left on the picture a singularly blurred line, the unevenness of which was attributable to atmospheric causes. Mr. Bond said he had, in 1851, obtained a daguerreotype of the stars Castor and Vega. That finished the list of most of the attempts that had been made to photograph celestial bodies down to a recent time; and, in giving them an account of the methods now in use, he should be principally indebted to the information he had obtained from Mr. De la Rue, either from personal communications or from his report to the British Association and other papers. It would be found that the great difficulty to be surmounted in taking lunar photographs was to make the telescope follow with sufficient accuracy the moon's course, which was more complicated than that of any of the other heavenly bodies. For this purpose they used a telescope with its axis tilted parallel to that of the earth, called an equatorial, which followed the course of the moon by one motion instead of the two required by the common altitude and azimuth mounting of a telescope. The telescope was driven by a clockwork machine, its speed being regulated and adjusted by a contrivance similar to the governor of a steam-engine, whereby equable motion at the desired rate was obtained. The apparent motion of the moon was not only slower than that of the sun and stars, but its change in declination was also much more rapid—that of the sun being only about 5' in the twenty-four hours, whilst that of the moon was often 10° in that time; and as this is not corrected by the driving clock, the best plan is to accelerate the action of the chemicals employed. Mr. De la Rue used a negative collodion containing iodide of cadmium, avoiding acetic acid and alcohol in the bath, which he made as neutral as possible, and developed with pyrogallic and acetic acids. By that means he obtained pictures of the full moon either instantaneously or in five seconds, and of the half and other phases in from thirty to sixty seconds. That gentleman sometimes exposed his plate in the usual way, in the situation of the eye-piece, and sometimes replaced the small mirror of his Newtonian reflector with the collodion plate, but had not obtained much greater quickness of action by so doing, as the actinic rays appeared not to be absorbed by the second mirror in the same proportion as the visual rays. Mr. De la Rue had the great advantage of having the actinic and visual rays brought to the same focus, as there is no dispersion by a mirror; and he could therefore obtain his focus by a magnifier. The great disadvantage of a refracting telescope was that the actinic and visual foci did not coincide, the former being always behind the latter; and hence the proper position of the plate could only be found by experience. In some experiments with his own four feet four inches telescope, of three three-eighths inches aperture, he found the actinic focus was from one-eighth to one-quarter of an inch behind the visual focus. In Messrs. Huggins's, Phillips's, and Fry's telescopes it was three-quarters of an inch, in Mr. Hartnup's eight-tenths of an inch, and in Mr. Bond's twenty-two feet telescope it was one and a-quarter inches, behind the visual focus. The negatives were very small, as even those obtained by means of the largest telescopes were only three inches in diameter, whilst those he obtained were only the size of a fourpenny piece, and Messrs. Fry's and Huggins's were about that of a shilling; but Mr. De la Rue had succeeded in subsequently enlarging his to various sizes up to ten inches in diameter. In taking the picture with a Newtonian telescope, the mouth was covered over when fixing the plate in its proper position, then uncovered until the exposure was sufficient; but where only one mirror was used, a screen was placed between it and the plate. Mr. De la Rue and Mr. Fry, by taking advantage of the librations of the moon, had produced some beautiful stereoscopic pictures; and Mr. George Jackson had reduced some lunar photographs for inspection in the microscope, wherein the detail was very perfect. Lunar photographs were of the greatest value to astronomers, who were thereby acquiring a more intimate knowledge of the details of the moon's surface; and, with respect to those dark portions of it usually called "seas," but which were known to be depressed plains, Mr. De la Rue was led to suppose they contained a dense atmosphere of small height accumulated at those spots. They would be of the greatest assistance in making maps of the moon, by allowing delicate markings on its surface to be examined at greater leisure than when looking through a powerful telescope. The double star Castor had also been taken by Mr. De la Rue's reflecting telescope; but the result was rather large discs than stars—that kind of telescope usually defining stellar points less perfectly than achromatics. It was very remarkable that, although at such an immense distance from our globe, the planet Jupiter possessed such great actinic power that its picture could be obtained in as short a time as sufficed for taking that of the moon, viz., five to twelve seconds, although its light was evidently not more than one-third that of the moon when seen in contact at occultations. Saturn usually required one minute; but, at a recent occultation, both Saturn and the moon had been taken in one picture in fifteen seconds. In accordance with a suggestion made by Sir John Herschel, in 1856, photographs of the sun were taken daily—when possible—at Kew, by means of an equatorial telescope of $3\frac{4}{10}$ inches aperture and 52 inches focus, made by Ross. It was corrected for coincidence of the visual and actinic foci; but that was slightly upset by the image being enlarged to 4 inches by an eye-piece, whereby the actinic focus was thrown one-eighth or one-tenth of an inch beyond. Great difficulty was encountered in endeavouring to overcome the intense action of the light, and coloured glasses, dry plates, and retarding chemicals were tried; but recourse was ultimately had to dispensing with the clock-driving machine, and taking the pictures instantaneously, by means of a slit in a shutter suspended by a thread, and pulled down by an india-rubber spring. When the image of the sun reached the proper point, the thread was set on fire, the image of the sun flashed momentarily through the slit on to the plate, and the picture was taken. That telescope was taken to Spain on the occasion of the total solar eclipse of July 18th, 1860, when two pictures of that interesting event were taken in one minute each; and the pictures so taken settled definitively the fact that the red flames seen round the moon during a total solar eclipse belonged to the sun, although they did not determine what those flames or prominences actually were. Mr. De la Rue had been successful in taking stereoscopic pictures of the sun with a few days' interval between each picture. It was remarkable that, whilst astronomers failed in taking photographs of Donati's comet with telescopes, Mr. Usherwood, of Walton, about the 26th September, 1858, alone succeeded in obtaining a negative of it, one inch in length, with an ordinary portrait camera, in seven seconds' exposure, without using any driving machinery whatever—an enlarged positive from which was exhibited. With regard to the application of photography to magnetism and meteorology, he had only to say that all the variations of the magnetic needle and the barometer and thermometer were ceaselessly registered by its means, and results of the greatest importance in those sciences were thus obtained. During the last twenty-five years great attention had been given to magnetism, Professor Gauss, a German, being the first to erect an observatory for its study. In 1837 the British government took the matter up, and built the observatory at Greenwich. The building was in the form of a cross, and was composed entirely of wood and copper, being 170 feet from any other building. The magnetic needle was always in motion, being subject to a periodical variation from the north of long duration, being now about $21\frac{1}{2}$° west, but gradually returning. It had also diurnal and annual variations, the peculiarities of which he explained, and also described the three magnetometers used to observe the declination and horizontal and vertical forces. In the photographic system of registration of the constantly varying forces used at Greenwich, and invented by Mr. Brooke, each large magnet had a mirror attached to the bar reflecting to a focus the light from a flame of napthalised gas on the surface of a glass cylinder containing a sheet of sensitised paper, and turned by clockwork. As the bar moved, so did the point of light move on the surface of the cylinder, leaving a line on the sensitised paper, which on being developed and fixed gave a perfect record of the variations. The declination and horizontal force magnets left their trace on a horizontal cylinder, while the vertical force depicted its undulations on a vertical cylinder, which also registered the variations of the barometer. This was done by means of a glass float resting on the surface of the mercury as it rose and fell, putting in motion a lever carrying a perforated plate in front of the sensitive cylinder, the magnified motions of the larger arm being registered by the light passing through the aperture. The modes of obtaining the base lines and time scales with the values of the curves were also explained. The variation in the wet and dry bulb thermometers were registered by means ef wires drawn across the tubes at each degree, and a vertical lens sending the light through the tubes on sensitised paper behind them, except where stopped by the mecurial thread. The paper being on a moving cylinder the variation was shown in a waving line. Mr. Ronald, at Kew, besides recording the indications of the magnets and meteorological instruments, also registered the motions of an electrometer in a similar manner, the diverging rods intercepting light thrown upon sensitised paper in gradual motion. There was an observatory at Oxford where the same means were adopted for registering meteorological variations. Mr. Burr concluded by thanking the members for the attention they had given him during his discourse, and again offered to give any further explanations in his power they might wish.

Some of Mr. De la Rue's finest lunar pictures were exhibited in illustration of the above remarks, as also micro-photographs and stereographs of the moon, specimens of the results of the Kew photoheliograph, with models and engravings of telescopes and apparatus, and some most interesting specimens of the curves produced by the Greenwich magnets.

A vote of thanks to Mr. Burr was passed amid great applause, in return for the trouble he had taken to afford the members present so much pleasure and instruction.

The Chairman observed that photography in some of its applications

really did not appear to be so much in its infancy as they were so frequently told it was, but appeared from Mr. Burr's interesting and instructive remarks to have arrived at full perfection. He thought it was the duty of Government to take the matter up, and not to leave photography to be applied to so important a science as astronomy by private individuals, or by the Royal Astronomical Society, without its help. The specimens exhibited by Mr. Burr appeared to him to leave nothing to be desired.

Mr. Burr remarked that photography was about to be applied to astronomy at Greenwich.

Mr. C. Jabez Hughes expressed the pleasure with which he had listened to Mr. Burr's excellent *resumé* of celestial photography. He had explained all it had done and was doing for astronomy, from the lunar daguerreotype of Mr. Bond to the latest achievement of Mr. Warren De la Rue. He had also in an interesting manner shown the wondrous application of the art to meteorology, and, with the aid of diagrams, had made clear the ingenious methods by which Nature was made to write down her own operations in her own unerring manner. He (Mr. H.) had never before been so impressed with the deep importance of photography. Usually it is employed as a luxury—trifled with as a toy; but (said he, pointing to the sheets with the photographic lines recording the perturbations of the magnet, and risings and fallings of the barometer, &c.) in looking at those papers I am filled with a feeling of awe; for those strangely and fantastically curved lines were produced by no human hands. We often speak figuratively of the "pencil of light," but here are its visible tracings. Man supplies the magic sheet, and Nature writes on it with her own finger the constant changes and variations of those great laws that govern and control the universe; and there are the very manuscripts. Mr. Hughes continued:—Daguerreotype, before it expired, gave the first impulse to lunar photography, and Mr. Bond's picture on the silver plate almost seemed purposely taken to contribute to that great focus of intelligence that took place at the Great Exhibition of 1851, where it was seen. Long prior to Mr. Bond daguerreotypes of the moon had been taken. He remembered Mr. Mayall taking them in 1847, and knew that he had been doing it for a year or two before; but, as they were very small, and not sufficiently sharp to bear magnifying, they existed only as scientific curiosities. They, however, thus early established the fact that the moon's rays possessed photographic power. With respect to the statement that Mr. De la Rue did not find the actinic rays absorbed in anything like the same ratio as the luminous, he thought that required consideration, as it was contrary to the experience of daguerreotypists who, in working with glass mirrors, found they lost the actinic in a similar ratio to the luminous rays. Mr. De la Rue also stated that there was a difficulty in working with a refracting telescope in consequence of the non-coincidence of the visual and actinic foci; but in his (Mr. Hughes's) opinion it was not necessary that they should so coincide, as they did not do so in the early Voigtlander's and many of the best French lenses. It was only necessary to discover the difference of the two foci for the usual distance at which the lens would be used, and to alter the planes of the ground glass and the plate holders to the extent of this difference; and so long as that camera and lens were used together all would go as right as if the two foci coincided. What was true of cameras must also be so of telescopes, which were only very long-focussed cameras. M. Claudet said the relative distance between the foci varied in the same instrument on different occasions; but the experience of other photographers was hostile to this view.

Mr. Fry found the foci vary in his instrument, and thought at first such variation was owing to the variation of the moon's distance from the earth; but Mr. De la Rue had explained the matter in a manner satisfactory to him, by attributing it to the contraction or elongation of the tube of the telescope by temperature.

Mr. Hughes thought under those circumstances both foci would be affected equally, so that there would be no variation in their relative distance. He thought it more probable that there was some error in the adjustments, as he found no variation in his camera.

Mr. Burr thought forty-five miles of atmosphere was sufficient to account for the disturbance.

Mr. Fry said the variations could not be owing to errors of adjustment, because he found them not occasional but constant. M. Claudet was much delighted on being informed of the circumstance, as it corroborated his theory. Mr. Hughes must recollect that the focal length of a camera was only eight inches, whereas that of his telescope was one hundred and twenty inches.

The further discussion was then adjourned to the next meeting.

Mr. Fry then read a supplemental paper *On Composition Printing*, in answer to one on the same subject read by Mr. Hughes at the last meeting.

The thanks of the meeting were voted to Mr. Fry for his paper.

Mr. Hughes said Mr. Fry and himself looked at the subject from different points of view, although their aim was the same, viz., to approach as nearly as possible to excellence and beauty. His whole argument, however, was concentrated in the expression—that the soul and strength of photography consisted in *its truth;* rob it of that, and no trifling or trickery could compensate for the loss.

The following gentlemen were proposed and duly elected members of the Society:—Mr. E. W. Foxlee, Mr. Symonds, Mr. John Warren, and Mr. Sydney Smith.

The proceedings terminated with a vote of thanks to the President for his services in the chair.

NOTICE.

The next meeting will be held on the 21st inst., when the discussion upon Mr. Burr's paper will be re-opened by Mr. S. Fry, and a paper read by Mr. Frank Howard, Hon. Treasurer, *On the Successful Practice of the Fothergill Process.* A jotting will also be contributed by Mr. Wall, upon *Sharpness.* The Secretary respectfully invites gentlemen interested in astronomical photography to attend. The presentation of their private card will procure admittance.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at Eight o'clock, on the 21st ult., at the Golf Club House, Blackheath Hill,—Charles Heisch, Esq., F.C.S., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman apologised for there being no paper that evening; and was sorry that the frost had prevented the results of several interesting experiments being made known to the members present. Two or three papers, however, had been promised for their next meeting.

Mr. Wood exhibited some stereoscopic views of scenes about Blackheath and in Wales.

A long conversation then took place among the various members present, but nothing of importance relative to photography transpired.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The monthly meeting of this society was held on Thursday, the 17th ult., at the Chorlton Town-hall. The meeting had been postponed from the 9th ult., to allow members more time to prepare specimens, it having been decided to hold one meeting entirely for the exhibition of magic-lanthorn pictures. Mr. Griffiths, a vice-president, took the chair.

The minutes of the last meeting were read and confirmed.

Mr. Ashley exhibited some specimens taken by artificial light, which were very much admired. They were exposed 16 seconds. The rotundity of the figure was striking, and the half-tones all that could be desired.

Mr Whaite having all his apparatus arranged, then occupied two hours in showing a great number of pictures, many of which were very much applauded as they appeared on the screen.

At the conclusion of the exhibition, after the lights were restored, Mr. Heywood moved, and Mr. Wardley seconded, that a vote of thanks be given to Mr. Whaite, for the great treat enjoyed by the meeting.

Mr. Rogerson moved, and Mr. Ward seconded, a vote of thanks to the gentlemen who had contributed the specimens.

A vote of thanks to the Chairman concluded the meeting.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

Well, you have now, we will say, prepared and fastened the photograph to your desk with drawing pins; set the palette as directed; got out your brushes, finding them nicely cleaned and pointed, and given them a rinse to free them from dust. You now proceed to fasten, either above or beside the photograph you are about to work upon, two others, as—

THE GUIDES.

Most colourists use one, but I generally prefer two guides—one to aid me in my treatment of the highest lights (the exact shape and situation of which it is vitally important to preserve); and another to assist me in securing the proper degree of gradation, transparency, and reflected light in the shadows. By *over*-printing the high lights may be secured in a strong dark print, although the shadows are thus destroyed; and by a little *under*-printing, the shadows of another print may be got as perfect as the negative can render them, although the more delicate half-tints may not be secured. I therefore prefer, as I have said, *two* guides—one a dark, over-printed, and the other a somewhat light, and under-printed proof. If your shadows are merely intended to be certain patches of conventional "shadow mixture," and your high lights mere chance splashes of ochre and white, why, one guide, or *none*, will be as useful to you as a dozen. If you are conscientious and ambitious, with a love of your art, no precaution will be thought vain that aids you in your aims. I know *too well* that photographers sometimes think a colourist's asking for *two* guides, printed expressly as guides, and, therefore, useless for any other purpose, is a tremendous bore; but if they want highly-finished artistic work, and perfect resemblance, two guides are better than one, just as one is better than none. It is true I have had prints to colour in which the perfection of modelling has been rendered, and nothing left to desire in the exquisite amount of gradation and truth of both lights and shadows, when one guide was as good as a score. Such

are the productions of T. R. Williams (of Regent Street), Lacy (of the Isle of Wight), and some few others; but such are not the general characteristics of the prints which fall into the hands of "photographic colourists."

And now, my dear pupil, the guides being in their place, you give the photograph a final wipe with the clean piece of linen rag prepared to clean your pencils with, and sit down to begin.

PRACTICE.

I shall here adopt the same plan for directing your studies in oil that I have reason to believe answered so well with our water-colour practice.

Take a clean, well-chosen, and small sable pencil,* remove with it a touch of the white to a clean portion of your palette, and there mix it with a little yellow ochre, and sufficient medium to make it work with a soft creamy smoothness, without being so fluid that it will not retain the exact shape your touches give it on the photograph's polished surface.† Be very choice over this dear little bit of colour: let it be clean, bright, and perfectly smooth in working; not too decidedly yellow, unless your model's complexion be so, but rather of a creamy, delicate, ivory-like hue. If it appears at all gritty, either rub it off altogether, or rub it down, until smooth, with your palette knife.

Fill your brush well with this colour, and with a few light decisive touches lay it in its place upon the brightest or highest lights, so as to preserve their precise form and position, bearing in mind all I have said about these "high lights" in former lessons, where they were more fully dwelt upon.

A little madder pink may be added to this on the palette, and worked into the previously applied colour, round the edges of the high lights, with light gentle touches, and as few of them as possible. This same tint may then be worked into stronger ones, compounded of the same pigments in varying proportions, until you begin to meet the earliest signs of gradation into half-tint.

But we must now pause and see what we have done.

Our colour is on the lightest parts of the forehead, nose, and cheek of the illuminated side of the face; but the colour on the brow is exactly the same as that upon the nose and cheek. This must now, therefore, be altered.

So we take a little bit of madder pink, and mix the same with a morsel of Venetian red on a clean portion of the palette, as before. This is a thin glazing colour, and we work it (as may be dictated by a study of the model's face‡, with touches of the lightest and most careful tenderness, so as not to disturb the colour already applied) over the cheek and nose, using a kind of stipple for this purpose, or applying it by a few touches placed here and there, according to the effect desired, *taking care not to use too much vehicle.*

Now, take another clean, dark, sable pencil, somewhat larger, give it a rinse in your brush-washer, and a wipe on your linen cloth; a rub in the magilp, and then another wipe on the cloth, and pass it between your finger and thumb, so as to flatten and spread the hairs out. This is now your "sweetener," or "badger," and a very nice one too.

With this go, with an extremely light sweeping touch, over the applied colours, so as to blend smooth and softer, without either muddling them, rendering them too uniform in colour, or working them up. Some skill and practice will be required to do this successfully, for though the tints are to be worked one into the other, each must preserve its own individuality. You mnst be careful, too, that the brush does not remove the colour from the surface, much of your effect depending upon the lights having a good body of colour.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H Wall, Esq., 11, The Terrace, Walworth.

A Lady Amateur.—The specimen tints have heen forwarded to the address given. I have before recommended Newman's water colours.

George Grant.—They will be published in a few months now, carefully revised and corrected, with here and there such important additions as have been suggested to me in the course of their publication. Thank you. Am very glad you think so highly of this Journal, and am sure it deserves your best praise.

Miss G——.—The same old fault—the outline destroyed. Use your colour thick on the high lights, but not so thick as to be perfectly opaque. Obtain body where desirable, by constant repetition rather than at once: it requires much skill to manage so large a quantity of colour within so small a space.

J. C.—Too hard, too cold, too crude and raw. Endeavour to acquire a soft mellow touch, and avoid sharp outlines. Use a little more magilp; work with more care and, perhaps, less speed. The head wants half-tints, and consequently roundness; for you seem to have overlooked the existence of greys in the flesh.

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* See the directions given for choosing water-colour brushes. I use water-colour sables for oil myself when the work is small.

† Some use a little wax dissolved in turpentine with their medium to secure this quality.

‡ In this case, as in the directions for water, I imagine you to be working from the sitter.

Foreign Correspondence.

Paris, January 28, 1861.

Allow me to commence my letter by replying to the reproach contained in the last number of The British Journal of Photography, to the effect that I had not given with sufficient explicitness the demonstration by which M. Léon Foucault had put an end to the discussion which had been called forth by M. Claudet's paper on Woodward's apparatus. If I did not give M. Foucault's words at length, it was because, as I had not been able to take them down in shorthand, I was fearful of changing their meaning in trying to repeat them. A mathematical definition cannot be translated by an *à peu près;* for each word is like a figure, having its own value, its own place. In saying, therefore, that M. Foucault had resolved the question triumphantly, I wished to summarily describe the impression which was produced by that gentleman upon his audience—an impression, in fact, which appears to be durable, as no one ventured to return to the subject even at last Friday's meeting, of which meeting I will speak presently. MM. Bertsch and Thouret had misunderstood M. Claudet's paper, and all their objections turned upon that misunderstanding. M. Foucault showed them their mistake: *voilá tout.* Now, if M. Claudet's reasoning be correct, is it not natural to conclude with him that Woodward's solar camera is based upon a good principle? Such was my conclusion. If, however, I was, with many others, mistaken, I shall be happy to see my error proved. With regard to M. Foucault's definition, I wished to give it to you textually to-day, and for that purpose asked M. Foucault to write it for me; but, as I have not yet received his note, I am obliged to defer it till my next letter.

The meeting of last Friday had promised to be of some interest, as the committee charged by the French Society of Photography to adjudge the Luynes Prize was to present their report. The Duke de Luynes, one of the most generous patrons that the fine arts count in France, had placed at the disposal of the society—1st, a sum of 8000 francs to be adjudged to the inventor of a practical process for the transformation of photographic pictures into plates capable of being printed by the means usually employed for engraving or for lithography; 2ndly, a sum of 2000 francs for the best charcoal printing process. While appreciating the value of the different processes submitted to their examination, particularly by MM. Poitevin, Nègre, and Pretsch, and while distinctly acknowledging the progress which those processes indicate, the committee did not deem that the results were sufficiently complete to warrant them in awarding the prize. In consequence, the delay was extended to the 1st of April, 1864. Some considered this date too distant, and therefore likely to discourage investigators; the majority, however, declared themselves in favour of the decision.

Mr. Harrison communicated some further details on the method employed by M. Fontayne in his machine printing.

The sensitive paper is rolled round two cylinders which are boxed in from the light, and moved by mechanism. The negative is placed under a corresponding aperture made in the top, which is closed by a shutter that opens each time a new portion of blank paper is brought under the *cliché.* The same mechanism that moves the paper onwards opens and shuts the valve. Thus, the first essay is made, in order to ascertain the time of exposure necessary according to the state of the light and the nature of the negative, and then the rapidity of the movement, and consequently the number of pictures printed per minute and per hour, can be regulated thereby. A powerful lens, placed at a certain distance, condenses the luminous rays, and throws them upon the *cliché,* thus rendering the printing so rapid that 200 copies can be pulled in a minute. During the recent presidential struggle in the United States 100,000 portraits of Lincoln and Hamlin were executed in this manner. As the portraits were very small 250 were printed on a single sheet. The development is done afterwards. I asked Mr. Harrison by what means the paper was prepared. He replied that he was not aware—that the inventor had kept silence on that subject.

M. Retzinski communicated another printing process, much less expeditious, but presenting, in his opinion, the advantage of great economy. M. Retzinski uses common paper. For albumen print-

ıg he employs a litre of egg-white to which have been added hree grammes of chloride of sodium; a five-per-cent silver bath, ›aper salted in a solution of chlorhydrate of ammonia in a litre of ommon water. He sensitises in the same silver bath. The expoure lasts twice as long as in the usual method. This process, vhich I wrote down as well as I could while the secretary was eading it, does not seem to me well balanced. Economy is cerainly a very good thing, but, in photography especially, "the learest is often the cheapest."

An inventor of the society, M. Gerin de Valdonne, announced by etter that he had found a means for the direct production upon ›aper, *without nitrate of silver*, of positive pictures in which the ights were very pure, and the shades of great vigour. He post›ones description till he shall have made further essays.

Another member, Dr. Signoret, wrote to say that, to his regret, ıe was compelled to give up photography on account of the pertur›ation in his health, caused by the emanations from the chemical ›roducts. He accuses collodion, or rather the vapours of ether, of ıaving developed in him a nervous malady. In his medical character he calls the attention of operators to the dangers they have ›o guard against. It is evident that certain substances employed n the manipulations exert a really hurtful influence upon the ıealth, without counting those substances presenting a still more serious danger, and of which the Almanac of THE BRITISH JOURNAL OF PHOTOGRAPHY has very rightly given the nomenclature. In general, professional photographers have an agitated sleep, and the ıervous system is highly excited. A serious and useful study might ›e made on this subject.

The Exhibition of the Society will take place this year, as it did wo years ago, in the Palace of Industry, at the same time as that ›f the Fine Arts. It will open on the 1st of May, and will close on he 1st of July. Specimens should be sent from the 1st to the 15th ›f April (limit strictly adhered to) to M. Martin Laulerie, Secretary-ıgent of the Society. The exhibitor should indicate in a note his ıame, the number of his specimens, as well as a summary mention ›f the negative process employed.

In my next letter I shall speak of the experiments which are occupying MM. Bingham and Nadar for the application of electric light to photography, and which have already yielded some curious results.

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the ıtmost of our ability, but we can only do so through the medium ›f the Journal. We cannot give private replies except to personal friends.**

MR. DALLMEYER'S TRIPLET LENS.

To the EDITOR.

SIR,—I am sure you will in fairness insert the following letter, in answer to Mr. Heath's questions respecting my advertisement.

I may remark that, had the subject been broached by some other person not commercially interested, the public would probably regard the question from a somewhat different point of view.

Hundreds of my new lenses, free from distortion, are already in use, and without exception not one single complaint has reached me respecting any one of them—indeed, quite the opposite. Until, therefore, some professional photographer of known merit comes forth to confirm Mr. Heath I deem it unnecessary further to touch upon the point.

Allow me here to state that the *first two lenses* I constructed and sold, one for plates 15 × 12 and the other for 10 × 8, were of smaller diameter than they are now and have been ever since the announcement appeared in the Journal.

Firstly, the "triple achromatic lens" is quicker acting than the "orthographic," because the relative intensities or quickness of two lenses (having the same number of reflecting surfaces) are in *direct* proportion as the squares of their apertures, and *inversely* as the squares of their foci. Now the focal length of the orthographic, for a given size plate, and with the same aperture, is *longer* than that of my "triple" lens in the proportions of 10 : 9, and therefore their intensities will be expressed by $1^2 : 9^2 :: 1^2 : 10^2$, or as 81 : 100; in round numbers, as 4 : 5; giving my lens the advantage to the amount of $\frac{1}{5}$.

My reason for making the comparison with the "orthographic" is owing to the fact that, having assisted my late father-in-law (Mr. Andrew Ross) in its construction, it will readily be conceded that I am intimately acquainted with all its properties.

Secondly, the "triple achromatic lens" is quicker acting than the single combination view lens, because, for the same size picture, and with equal diameters of stops, its focal length is less in the proportion of 10 : 9·4; therefore, according to the above rule, its intensity in round numbers is greater by $\frac{1}{9}$.

The loss of light, as occasioned by the greater number of reflecting surfaces in the "triple," is compensated for by the circumstance that, although stops of equal diameters are employed in both cases, yet the size of the pencils of light, as transmitted by the two lenses, is by no means the same: for in the case of the single view lens the stop is situated "before" the lens, and therefore limits the diameter of the several pencils before refraction; but in the case of the "triple" the stop is situated "behind" the front positive combination, where the rays are already converging, and therefore the pencil of light received and transmitted is considerably larger than the diameter of the stop.

I may observe that what has been advanced above has also been confirmed in the experience of numerous professional photographers, and it was only after that confirmation had been obtained that the announcement was made in my advertisement.

In regard to other good qualities possessed by my new lens, such as perfection of definition, flatness of field, perfect straightness of marginal lines, &c., Mr. Heath does not appear to question; and since photographers and the public generally are already well acquainted with the "triple achromatic lens" and its merits, I will not trespass any further on your valuable space.—I am, yours, &c., J. H. DALLMEYER.

19, *Bloomsbury Street, London, Jan.* 22, 1861.

[We would draw the attention of Mr. Dallmeyer to some obscurity in his reply. The *size of a plate* which any given lens is supposed to cover has nothing to do with the points in question, which we take to be as follows, viz.:—1. Will a given *equivalent* focus for both lenses with the "triplet" and the "orthographic" lenses bear equal apertures with equal definition for an oblique pencil at a given amount of obliquity from the axis? If so, their "rapidity of action" should be equal.—2. The same question as applied to the "triplet" and "meniscus." In this case the "meniscus" would have the advantage with *equal* apertures having but two *surfaces of reflection* instead of six.—3. With the *same equivalent foci*, and equal apertures, which of the three named lenses will cover properly the largest area? It is notorious that the late Mr. Andrew Ross always *under-estimated* the surface which his lenses would cover well; consequently the lenses recommended for a given size plate, unlike those of most other makers, would generally cover a plate of a size larger exceedingly well.—ED.]

ROSIN PROCESS.

To the EDITOR.

SIR,—You have, in No. 131, certainly pointed out the worst qualities of the process of mixing rosin with the collodion. Impaired sensibility after lengthened keeping, and ripping of the film, are the weak points; but the merits of far greater importance which have excited my enthusiasm you have not alluded to. Now, you must admit that the susceptibility which will give you a rich negative, in sunshine, in one minute and-a-half, in place of six minutes, and, more than this, in three minutes to produce an effect in a light that would scarcely act upon a Fothergill plate at all, certainly not under ten minutes, has much to recommend it. Farther, though it is as easy to pour albumen upon the plate before exposing as it is after developing, yet, with what I advocate, there is no need to do it unless you find you have a picture worth the trouble; on the principle of Mrs. Glass's cookery, viz., "first catch your hare," &c.

I will say nothing of the frequency of stained plates by the primary application of albumen, with the entire absence of this nuisance by the subsequent application. The minute spots you speak of I have never seen: may not these be, not from the presence of rosin, but excess of iodising ingredients; or, if rosin, the superabundance of it? Three grains, not to one ounce, but to four ounces, is ample.

Now, as regards derangement of the bath, I have used the same for three months without detriment. Suspended by the collodion as it is, it is a great question if carboniferous, not carbonaceous matter—if I may draw the distinction—would prejudice an aqueous solution at all; howbeit, the carbon in its free state may, and no doubt does, impair the crystallisation, as your learned colleague tells us.

Apropos of that—what say you to the occult influence exercised by the subsequent dipping in the bath? The very sagacious remark of the photographer's good genius, Mr. Hardwich, first attracted me to the use of this process.

I would desire to lay considerable stress upon this important point, though I have before alluded to it, because much of the beauty of the results arise from the redipping of the plate just previous to development. The action of the rosin is merely mechanical; but there is a force and vigour displayed, after redipping, and the appearance of the image is so prompt, yet so equal, that failure is impossible. Now, in no other method have I seen this insisted upon: and here is another stubborn fact for your consideration, that not merely has the same bath lasted unimpaired for three months, but as every plate has been dipped and allowed three minutes' immersion before, and two minutes after every exposure, it has, of course, undergone double working, and yet I can detect no fault in it. Now, my friend, I think "I have *thee* upon the hip."—I am, yours, &c.,

C. COREY.

[To the preceding note, written in a spirit that it is quite refreshing to find prevalent with those who take the other side of the argument, we re-

ply with another gastronomical allusion—"the proof of the pudding is in the eating." If our theory of the bath being likely to be put out of order be not borne out by facts, we have not the hardihood to exclaim with the genius—"so much the worse for the facts!" With regard to the distinction between carboniferous and carbonaceous, we should apply the former to ether, alcohol, &c.; the latter to rosin. It is the carbonaceous ingredient that we fear. However, we must not forget the story of the man in the stocks, who was asked "what he was put in for?" "For so and so," was the reply. "Nonsense!" was the rejoinder—"they *can't* put you in for that!" "It is all very well for you to say so, but *here I am!*" was the climax. "You can't take good pictures by the rosin process," is what we have implied. "Indeed! but here they are," responds Mr. Corey. ED.]

MR. TUNNY AND GALLO-CITRATE OF IRON.

To the EDITOR.

SIR,—Please allow me, as a simple piece of justice to Mr. Tunny, to reply to the letters respectively of "Amateur," "R. Gordon," and "R. M. S.," which appeared in your last number. Reference has been made by all of them to my paper on transparencies, read a year ago before the Caledonian Club—not in Glasgow, as "Amateur" says, but in Edinburgh. When reading that paper I informed the members that it was to the kindness of Mr. Tunny I was indebted for the developer in question; but this remark being *extempore*, and not embodied in the paper, our Secretary had possibly neglected to insert it before sending off the report of the transactions of the Club. When Mr. Tunny furnished me with particulars about this developer, I understood from him that he had been in the habit of using it for a considerable time previously; and I was also made aware by him that Mr. Rodger, of St. Andrew's, was in possession of a similar formula, which (if my memory serves me right) he had obtained by his own investigations—at any rate, quite independently of Mr. Tunny.

I would take this opportunity of thanking Mr. Tunny for the free and hearty way in which he is ever ready to communicate to amateurs information which in many cases is carefully, very carefully, withheld by other professionals.—I am, yours, &c., J. P. M'ADAM.

P.S.—Surely "Amateur" has made some slight error in the formula for a developer which he gives as extracted from *Hogg's Manual;* as (in accordance with my expectation) it produced, in my hands, a liquid which at a pinch would make a very decent writing fluid.

APPLICATION OF PHOTOGRAPHY IN THE CONSTRUCTION OF MICROMETERS.

To the EDITOR.

SIR,—I take the liberty of correcting a slight error in your remark upon the above subject in THE BRITISH JOURNAL OF PHOTOGRAPHY for September 1.

If you will be kind enough to refer to the *Quarterly Journal of Microscopical Science* for April, 1856, page 240, you will find that the suggestions of Mr. Clarence Morfit have been anticipated by, yours, &c.

Moore College, Liverpool, N.S.W. WILLIAM HODGSON.
November 19th, 1860.

LIGHT! GLASS! VARNISH!

To the EDITOR.

SIR,—Permit me to correct some errors in the report of my remarks on Mr. Rejlander's interesting communication to the Birmingham Photographic Society.

First, *apropos* of the amount of light (quantity and quality) admissible with impunity into photographic tents and operating rooms, I said:—"In my experience, when a flood of yellow light is allowed to stream into the operating chamber, although it would neither cause the excited plate to 'fog' nor to 'blacken,' yet that it so changed the condition of the plate that when subsequently exposed in the camera the picture never came out on development with the same brilliancy as if it had not undergone the exposure to the yellow light."

Next, with regard to certain patches on glass plates of a quasi-crystallised matter exceedingly difficult to remove, I said:—"I had most frequently found this condition when the glass (new or old) had been allowed to soak for a time in a solution of carbonate of soda or of cyanide of potassium, and more particularly if the plates had been laid horizontally. I supposed that, as all glass contained more or less lead in its composition, the silicic acid had a greater affinity for the soda and so a surface decomposition took place with the deposit of crystals. At all events I get rid of this annoyance at present by placing all my glass in a vertical position in rain water, that being naturally in a great measure free from metallic salts."

Then with regard to the cause of the frequent cracking of varnish on photographic plates (independent of the constitution of the varnish itself), I observed that "I had been peculiarly unfortunate at one period, owing to the use of crystal sheet glass for positives—nine-tenths of my pictures on this substance being spoiled, while those on the 'flatted crown' or on 'patent plate,' though varnished equally with 'Sœhnée,' seldom 'cracked' or 'reticulated.' I looked on the cause as traceable to the amount of moisture which 'crystal sheet' *gives out*, technically, 'sweating,' and that certainly the drier the quality of glass I had used the less I had been troubled with cracking of the varnish."

The importance of the subjects of "light," "glass," and "varnish," in photographic art, will, I trust, plead my excuse for troubling you with this *corrigé* of the remarks which I ventured to make as a visitor to the Birmingham Photographic Society.—I am, yours, &c.

Jan. 16th, 1861. JOHN ANTHONY, M.D.

ANSWERS TO CORRESPONDENTS.

H. R. R.—In an early number.

T. JOHNSON.—See Mr. Hardwich's "Comments" in the present number.

T. F.—We are unable to comply with your request: we do not consider it fair.

F. R.—You only require the addition of a little pure ether, and no doubt all will work satisfactorily.

S. CONWAY.—We have every reason to believe that you will be satisfied with the chemicals sold by the firm which you mention.

C. H.—There is no typical error with *our* printer in what you notice—the statement agrees with the MS.

A. H. B.—We have forwarded your note to Mr. Wall, as we are unacquainted with the practice of colouring.

F. R.—See reply to "J. Barrow," so far as relates to developer. To your other question—Pothergill's.

FEARFUL.—You had better employ two cameras—one for landscapes and another for portraits. You will find it economical in the end.

WEAK SKY.—If you pay a visit to the Photographic Exhibition in Pall Mall, now open, you will see some of Mr. Mudd's pictures treated as described. They are very good.

T. B.—Quite possible, if there be a sufficient number from which to select; though it is desirable that they should be made of the same glass and ground in the same tools.

SCOTCHMAN.—You had better employ *oxide of silver* to neutralise your bath, then carbonate of soda, which, in unskilful hands, is apt to get you into a scrape. We have just replied to another correspondent who has spoilt his bath with it from inexperience.

HUGH SOMERVILLE.—Mr. Dancer, of Manchester, can, no doubt, procure the apparatus for you, even if he has it not already in stock; or Mr. Atkinson, of Liverpool. These are the two nearest dealers to you that we know anything about.

JAS. M.—If you have a sliding front to your camera you have only to unfasten the screws and replace the front piece with a corresponding piece of *yellow pine*, which is procurable from any carpenter, and is soft enough to be worked with a knife if you have no other tools. This will enable you to fit any other lens on your camera than what you have, and wish to try, without defacing the camera.

S. CAMERON.—No apology necessary; we most willingly afford our assistance. You have sensitised your paper on a bath not sufficiently rich in silver; hence the poor, flat, grey tone. Double the present strength of your bath; you will find it more economical in the end. Do not use the paper too dry, as it quickly absorbs moisture in the pressure-frame, and this it is which gives rise to the "wrinkles" that you mention. You will find the toning formula in the Almanack.

W. J. G.—The difference in time of exposure with a portrait lens is certainly in favour of that arrangement, where a diaphragm of a given diameter is placed between the components of the combination; but the amount of difference depends upon its distance from the front lens. The reason is obvious—the diameter of a converging pencil of rays is smaller as you approach the focus, hence a given aperture will admit the passage of a larger pencil when limited at a distance from the point of refraction, than at that point. The diaphragm between the lenses causes the field to be more curved than when it is placed in front.

J. BARROW.—Your specimens arrived in some thousands of pieces—in fact, reduced almost to powder—consequently it was simply impossible to judge of their merits. An iron developer is totally unfit for micro-photography; you had better use the following, viz., pyrogallic acid one grain, citric acid one quarter grain, distilled water one ounce, acetic acid twenty minims, by which you will obtain a pleasant brown tone. The collodion you have may be very good: try it with the above-indicated developer. Keene's and Ponting's collodions also answer very well, as also Burfield and Rouch's. For localities consult the advertisements.

B. W.—You do not say what *kind* of photograph you wish to be reproduced, whether daguerreotype, glass positive, or paper positive. If it is on paper, the best way would be for you to put it into the hands of an artist, who can possibly "touch it up" to make it "legible;" and then, by copying the same in the camera, the discrepancies of colour, if any, will be got rid of. If your original is a daguerreotype, and not rubbed, send it to Mr. C. Jabez Hughes, of Oxford Street, London, who will probably be able to help you out of your dilemma. If it be a glass positive, consult Mr. Keith, of Castle Street, Liverpool.

A GOOSE.—1. You have thrown away the carbonate of silver, and certainly *very much* weakened the bath, if not destroyed it altogether.—2. There is no chemical difference between a collodion positive and negative; but owing to the presence of organic matter in the latter when pyrogallic acid, &c., are used for developing, the *molecular* condition of the reduced silver is different in the two cases.—3. No. If the developer blackens on the addition of a few drops of solution of nitrate of silver as rapidly as you mention, it is an indication of there being *too small a quantity of citric acid* present. Remedy: Add about a quarter of a grain more of citric acid to each ounce of developer, and if that be not enough add again a like quantity.

A PUZZLED ONE.—We do not wonder at it. We regret to find the very loose morality existent with regard to advertisements, in which some parties appear to think that they have a perfect right to make any statement, however preposterous, with impunity. We are quite willing to presume that when an advertiser vaunts the good qualities of his wares he may possibly really believe that his geese are swans; but he certainly has no right to assert that those vended by others are spurious, unless he can distinctly *prove* the fact to be so. We regret that you have nobody in your locality through whom you can with confidence procure what you require. You will, perhaps, be able to solve most of your doubts by reading the *Letters to a Photographic Friend* recently published in these pages. For the last article about which you inquire apply to No. 3 in your list; and avoid No. 5 especially, who only deals in the so-called *cheap*.

DISCONTENTED.—We cannot publish your letter, because it refers to matters relative to which *the public* are not interested, but only those who are members of the Photographic Society; and as we do not officially represent that body, which has a special organ of its own, we think you had better forward your communication to Dr. Diamond, the responsible editor, and he will probably deal with it, either by laying it before the council or publishing it, as he deems best. We may remark, however, as a member of the Society, and in our private capacity only, that we cordially agree in the policy of reducing the number of members of council (provided that it be done in a legitimate manner), and before we retired from office we repeatedly urged this course without success. We believe that you are quite in error in attributing interested motives to those who remain on the council. We know for a fact that there is absolutely no advantage derived, but much labour and trouble incurred, by those who take an active part.

RECEIVED.—R. T.—MAX.—CON TUTTO CORE.—AN AMATEUR.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 136, Vol. VIII.—FEBRUARY 15, 1861.

Royal Favour.—Her Majesty the Queen and H.R.H. the Prince Consort, accompanied by the Princesses Alice, Helena, and Louisa, and attended by several members of the Court, paid a visit to the Photographic Exhibition now open, and minutely inspected the various works there on view, upon many of which they were graciously pleased to bestow considerable commendation. We have no doubt that photographers generally will be highly gratified to find that Her Majesty, so far from losing her interest in our fascinating art, appears to enjoy it with increasing zest.

Toning of Positives.—We published in our last, at page 44, an article from our valued contributor, Mr. Charles Heisch, in response to some editorial remarks upon observations made by him as President of the Blackheath Photographic Society, at a meeting of that body, the subject being that of the toning of positive paper proofs. We must correct Mr. Heisch's assumption that we ever libelled him as "an enemy to progress:" we certainly did not attribute any such *animus*, but pointed out that the observations he had made would be likely to do mischief, precisely because he has established a reputation as a scientific and progressive photographer. It is this conviction which we expressed, and which we still entertain, namely, that, having inadvertently adopted certain views from insufficient consideration, the expression of his questionable conclusions, as it were *ex cathedra*, would be likely to prove injurious in certain quarters were no attempt made to cause him and others to keep in mind the already established facts bearing upon the subject.

Mr. Heisch entertains doubts whether the alkaline gold toning process produces results of *equal stability* with the "older process," meaning thereby that where chloride of gold and hyposulphite of soda are used in conjunction for fixing and toning simultaneously. We have no doubt that the evidence, so far as it has yet been tested, indicates that the alkaline gold method affords *more* stable results.

The abuse of "an old and tried process *proved to yield permanent prints*, if proper precautions have been observed," has not arisen "simply because a new one has been brought forward which is by some people considered theoretically more correct;" but, on the contrary, it is because it is found *practically* that, if in both cases the proper precautions are neglected to some extent, such neglect is more detrimental when the old process is employed than when the alkaline gold toning bath has been resorted to; while it has been proved beyond question that the chief destructive agents, oxygen and sulphuretted hydrogen, especially in the presence of moisture, exert respectively a far more baneful influence upon the proofs toned by the old process than on those by the new one. This fact having been established, it is found also to be in accordance with theoretical considerations. It must also not be forgotten, that the penalty incurred by neglect when the alkaline gold toning process is employed is generally more prompt in appearing, and thus it falls, as a rule, upon the right shoulders; the careless manipulator being generally the sufferer, by loss of his labour and materials.

We now arrive at another remark in Mr. Heisch's paper upon which we wish to comment. It is as follows:—"It is customary, in speaking of the alkaline process, to call the gold bath the toning, and the hyposulphite the fixing bath, as if the only action of the latter were to dissolve out unchanged chloride of silver. If such were the case why cannot ammonia be substituted for the hyposulphite of soda, and so the very presence of any sulphur compound throughout the process be avoided? The answer is, that the colour of the prints would not be good. In fact, toning strictly takes place as much in the hyposulphite as in the gold bath. To what is this toning due? To something more than the mere removal of unchanged chloride of silver."

To the above we reply that ammonia can be substituted for hyposulphite of soda for fixing the proofs after or even *before* the alkaline gold toning; and that we pointed out this very fact in a communication to the Photographic Society several years back; and, further than this, that after coagulation by contact with nitrate of silver even strong liquor ammoniæ does not dissolve off the albumen from the surface of the print. If Mr. Heisch will try the experiment he will find that after the use of ammonia the colour of the prints will, *when dried subsequently*, be just what they were prior to their removal from the gold toning bath; and that in order to obtain agreeable warm tones it is only requisite to employ English paper albumenised, instead of the foreign kind generally adopted. There are objections to the general use of ammonia as a fixing agent, it is true, and serious ones we admit. Extra cost; great inconvenience in application from the suffocating fumes given off, even when a dish with the edges ground and covered with a glass plate is employed; and, thirdly, the tendency to remove the sizing of the paper—an operation which is instantly effected with foreign paper, on account of the frequent use of starch as a sizing material. These are grave objections to the general use of ammonia for the purpose suggested; but they do not nullify the fact that good tones can be attained by the alkaline gold bath in such a manner that their being the result of sulphurisation is *impossible*.

We would not any more than our esteemed antagonist "shut our eyes to the weak points of a favourite process;" but we have yet to learn in what the alleged "weak points" really consist. In truth, we at present do not know that any exist, and shall be glad if Mr. Heisch will point them out; but in case he should be able to find any, our course would be rather to try and remedy them than return to a process which we believe to be undeniably faulty in principle.

New Photographic Society in Edinburgh.—We learn from a correspondent that a number of practical photographers are about to form a new Society in Edinburgh. A preliminary meeting (presided over by George H. Slight, Esq., Engineer)

has been held, and the expressions of opinion there elicited seem to indicate that fortnightly meetings will be held, and that these will mainly partake of a conversational character. We are informed that the first meeting for the adoption of laws, election of office-bearers, &c., is to be held at Buchanan's Temperance Hotel, on the evening of Wednesday, the 20th inst., upon which occasion we are given to understand that any one friendly to this movement, whether specially invited or not, will be at liberty to attend, and will receive a cordial welcome by those who have already taken the initiative.

French Photographic Exhibition.—We are requested by M. Martin Laulerie, the assistant secretary of the French Photographic Society, to announce that a Photographic Exhibition will be held under the auspices of that body, contemporaneously with the Exhibition of Paintings at the Palais de l'Industrie, Paris, from 1st May next to 15th July inclusive; and to invite the co-operation of British photographers in contributing to the collection.

We extract from the regulations such points as affect foreign exhibitors:—

"All works intended for exhibition are to be sent (carriage paid) to 'M. Martin Laulerie, door No. 1, Palais de l'Industrie, Paris,' and must arrive between the 5th and 15th of April next ensuing. No extension of time can possibly be allowed beyond the last date specified. To avoid cost of transport, foreigners are recommended to send their works mounted simply on cardboard to some correspondent in Paris, to have them placed under glass; and to those who have no correspondent the assistant secretary, M. Laulerie, offers his services for the purpose of procuring their being carefully and properly mounted under glass at the least possible expense. In this case they should be addressed to him at No. 11, Rue Drouet, and ought to arrive between the 5th and 10th April.

"Each specimen to be accompanied by a statement of the *subject represented*, with a summary of the process employed in its production, and any information relative to its peculiarities. The name and address of the exhibitor may be appended, but no statement partaking of the nature of an advertisement will be permitted, nor the price of the picture, if for sale; but this last-named particular may be stated to M. Laulerie, who will communicate it to the public.

"A list of subjects contributed must be forwarded to the assistant secretary, together with the particulars above specified, for the purpose of insertion in the catalogue.

"Coloured specimens, as also those being 'touched by hand' so as essentially to modify the photographic work, properly so called, by substitution of manual skill, will be rigorously excluded, as also works that have already been exhibited in former expositions of the Society; but the same subjects that have appeared before even by the same artists, *if from different negatives*, are admissible."

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XVIII.

The question of permanency of photographic pictures on paper has been again opened up in consequence of remarks made by Mr. Heisch, President of the Blackheath Society. We have always been greatly interested in this matter, and therefore it may not be altogether unprofitable to state our experience.

It will be remembered that, as long ago as the year 1855, the Photographic Society of London appointed a committee to examine and report upon the merits of the various printing processes, and to consider how the positives might best be preserved from fading. A large number of experiments were made, and the separate portions of the prints which had been operated on, having been mounted upon cards, were exhibited at the Society's rooms, and are to be seen, even now, in the laboratory of the photographic department of King's College.

Those who decry toning by mixed hyposulphite of soda and chloride of gold will perhaps learn with surprise that, at the time of the appointment of the above committee, many scientific and well-informed men were advocates of a method of toning by decomposed hyposulphite of soda altogether free from gold. We ourselves finding "the old hypo. bath," as it was termed, in frequent use, had endeavoured to imitate it by mixing tetrathionate of soda with the fixing bath, and prints toned in that manner were tested by the committee. Eventually all, or nearly all, became convinced that the sulphur toning process was fugitive and bad, and that even when gold was employed the permanency of the tones varied much with the mode in which the gold was applied.

Commencing with the fixing and toning bath, prepared by adding chloride of gold to hyposulphite of soda, we observe that the following were the conclusions arrived at in 1855:—In all cases a liberation of sulphur takes place on mixing the above salts; for even supposing the free acid to be removed from the chloride of gold by neutralising with a base, yet *tetrathionate* of soda will be produced in small quantity, and by a secondary reaction the tetrathionate and the hyposulphite will decompose each other. Nevertheless, prints properly toned in a bath of the above kind did not show a very marked disposition to fade, and retained their brightness under a treatment which destroyed the sulphur prints. Looking only at the experiments of the committee, the hypo. and gold-toning process could not have been utterly condemned, provided sufficient security had been given that photographers in employing that process would carry it out in a proper manner. Herein, however, the weak point appeared; for it was shown that after a certain number of pictures had been toned in the bath the character of the colouring action changed, and *sulphur* began to effect that which had previously been produced by a deposit of gold. Of this the photographer was necessarily ignorant; and, when toning a number of pictures in the same bath, did not know that the first of those pictures was far more permanent than the last, although the colours were in both cases nearly the same.

Against the *sel d'or* process nothing could be said; for, although it appeared certain that some communication of sulphur took place, and that sulphide of silver was formed upon the print in minute quantities during the time that gold was depositing, yet the experiments showed that the *sel d'or* pictures were permanent for all practical purposes: they remained in damp air, for three months, without any change, and are to this day as fresh as when first printed. If the *sel d'or* process could have been carried on successfully with albumenised paper we should scarcely have needed any other, but might have rested content and have discontinued our experiments.

Mr. Waterhouse's method with alkaline chloride of gold, the description of which he accompanied with specimens, was examined and reported on. The prints were quite permanent; but unfortunately the same objection seemed to apply as that to the *sel d'or*, viz., that a good colour could not be secured upon albumenised paper. Readers of this Journal who are using the above process daily will wonder how such a conclusion could have been arrived at; but the truth was, that the albumenised paper was unadapted for the purpose, and therefore gave cold and inky tones, not bearing comparison with those obtained by the mixed sulphur and gold toning. It often happens in photography that an experimenter comes very near to a good thing, but from some trifling disturbing cause fails to secure it. Mr. Waterhouse himself worked with paper prepared with caseine; and none of the specimens sent by him were printed upon albumen. Unfortunately he was not at the time in good health, and therefore the committee were obliged to be satisfied with his original communication, and could not venture to trouble him for further particulars. Mr. Frith, of Reigate, was the friend to whom we have alluded on a former occasion as having been the first to show that alkaline chloride of gold could be worked commercially on a large scale, and with albumenised paper; but even after we had seen him operate we could not achieve the same success with our own albumenised paper, and hence the addition of citrate spoken of in our communication to the Society at that time.

Although we do not share Mr. Heisch's apprehensions as to the stability of prints toned with alkaline chloride of gold, yet it appears to us that photographers must be careful how they tamper too much with the formulæ laid down, and especially as regards the quantity of the carbonate of soda to be used. Mr. Waterhouse himself gave no directions as to quantity, but merely said:—"I take potassæ subcarb., and add it to the chloride of gold, more or less, according to the colour I wish to obtain." Thirty grains of carbonate of soda to each ounce of water appeared to us to answer, and therefore we published the formula in that shape; but the

later experience of photographers has decided them to reduce it further. Mr. Hughes, who takes a practical view of most subjects, has fixed it at ten grains; but there we advise him to stop, and not to go on to the employment of neutral chloride of gold without any alkali. The reasons alleged for the reduction in the amount of alkali are the diminished tendency to blistering of the albumen, and the greater freedom from red spots and markings due to imperfect toning. We are quite prepared to allow that the excess of alkali interferes with the rapidity of toning, and prevents the gold from depositing upon defective portions of the paper which offer a resistance; but this we think should be remedied by improving the quality of the paper, and by bringing it up to the altered demands of the process. Against too great a reduction in the quantity of the alkali we have a word to say on the score of permanency; for it will be allowed by all that the reaction of the print on entering the hyposulphite fixing bath ought to be alkaline, or at all events not acid. Now, let any person who uses commercially-prepared albumenised paper, touch it with a piece of moistened litmus, and he will probably find that the blue colour immediately changes to red in consequence of the presence of some acid, which the maker adds for the purpose of liquefying the albumen. Further than this, MM. Davanne and Girard have lately called attention to what we believe to be a fact, viz., that a neutral chloride and nitrate of silver becomes *acid* when reduced by the sun's rays. Hence free acid exists in the print from two sources; and, if so, an excess of alkali is required to neutralise it before it comes into contact with the hyposulphite. We ourselves having witnessed from the very first the deleterious effects of free acid, were advocates for the addition of carbonate of soda to the fixing bath, and in our own practice have followed that plan. If others, however, find the alkaline fixing bath to cause blisters, let them omit the alkali; but we advise, by all means, to keep a portion of it in the solution of chloride of gold. At present the process is successful; and the public are becoming convinced by degrees that paper photographs do not necessarily fade. Let us then by all means leave well alone, and continue to work with the alkali in the toning bath; otherwise we may inadvertently introduce a weak point into the process, and some maker of albumenised paper, innocent of the consequences, may send us a batch of paper sour enough to liberate sulphur in the fixing bath, and thereby to "improve" the prints for a time, but eventually to destroy them.

ON ALBUMENISED PAPER AND ALKALINE GOLD TONING.

By C. Jabez Hughes.

[Read at a Meeting of the London Photographic Society, on February 5, 1861.]

The usual mode of opening a discussion is to apologise for the subject, and to depreciate oneself for bringing it forward. I am sure you will excuse these conventional formalities, for no plea need be urged to establish the importance of Good Printing.

All our other processes are but preparatory steps to printing. For that we make our pyroxyline, prepare our collodion, purchase our apparatus, and rack our brains to produce perfect negatives. With this object before us we travel o'er land and water, climb glaciers, face waterfalls; on mountain top, in sheltered valley, on open heath, in deep forest, or dark glen — wherever or to whatever we point our lens this is the consummation we always have in view—the reward for all our labour.

If not the *be all*, printing is certainly the *end all* of our various processes. It is the last crowning stone of the edifice — the very apex of the pyramid.

Yet, with all its importance, we do not do it justice. We vote it a bore—we declare it drudgery—delegate it to our assistant—put it out to be done—employ ignorant men, silly women, and foolish children to do it. We hurry it over, begrudge the time, stint the money, use the cheapest materials, and, finally, inconsistent beings as we are, express astonishment that our results are not uniformly of first-rate order.

Note the different degrees of care with which the two halves of the photographic process are conducted. For our negatives we obtain the best glass, prepare it most scrupulously, and do not dare to touch its clean surface; but our boy lets the albumenised paper lie about anywhere, and he fingers it and "paws" it all over. Our collodion we pay whatever price the celebrated maker asks for it, so that it be up to the right standard, and we watch and study it as to its age and condition; but we send here, there, and anywhere for our paper, and generally with an eye to cheapness.

We should not dare to keep three or four sorts of collodion, and jump from one to the other, and expect at once to get equally good negatives; yet we employ different samples of paper, treating them all alike, expecting they will or ought to "come out" equally well, and, without hesitation, condemn them if they have not answered our expectations. We know that different kinds of collodion require different baths and developers, and variable manipulation; but we have yet to learn that different papers require their special treatment too. In our negative bath we use the purest recrystallised or fused nitrate; but anything will do for printing. We make up one bath with religious care, and most jealously watch its condition; but the other may take care of itself. It is sixty-grain to-day, may be forty to-morrow, and the day after, in a fit of generosity, may be strengthened to seventy. This week it is acid —next it may be alkaline; but too generally it may be what it likes and how it pleases.

There are many photographers who really do take pains, and study the production of their prints as carefully as their negatives, and they have their reward; but the majority do not. These latter treat the operation as if it were mechanical, instead of chemical, and expect it equally readily to be despatched. The very term "printing," by the association of ideas, helps to confirm the mechanical notion. The letterpress printer bestows all attention on the skilful arrangement of his types, the engraver on the cutting his plate, the lithographer with drawing on his stone, and wood-engraver on the block; this well done, the rest is only careful "working off" or "machining." But photography is not mechanical, and will not be "machined." The simile holds good between composing the types and making the negative, but it wofully fails after; for every photographic print is the result of a series of delicate chemical operations, and if the result be not as we wish, we must endeavour to discover where the error creeps in, and either by alteration of manipulation or variation of material produce better results. If photographers would but look at prints as chemical, not mechanical, products, and endeavour to grasp the causes that produce them, from that moment their prints would be improved and their effects more uniform.

With relation to present troubles, most of them are based upon and grow out of that fatal facility of production that was in use during the sulphur-toning period. It was necessary then only to take the print out of the pressure-frame, and immerse it in the inky hypo., and there it remained until it was "done." The present method requires much more care and attention, and by some this is given grudgingly: they shirk the proper preliminary washings, and, getting into trouble, of course blame the process. Sulphur as a toning agent was not very delicate: much or little albumen, or none at all, it was chiefly a matter of time, and it served all prints alike. Whether the paper was thick or thin, English, French, or German, it toned them all the same. Like a specious, plausible, malignant, destroying demon, as it was, its *in*-justice was impartial.

But our present protecting agent, gold, is much more nice and delicate, and recognises most critically the differences of much or little albumen, of the various kinds of paper, and of minute variations of manipulation. We are now in a transition state, and shall doubtless yet arrive at a perfect toning process, which will be uniformly certain; but we must throw away some of our past notions, and not say what albumenised paper and gold *ought* to do, but what we can obtain from them. *They* will not yield, so we must.

Too many of our printing notions depend on those conceived during the sulphur-toning period. There is a tendency to depreciate the application of those careful rules that we apply to the production of negatives. The printing process is almost supposed as if it ought to be automatic—self-working. I don't know why we ought to assume this. It would be very desirable if it were so; but at present it is not.

In the practice of negative-taking we are not surprised if a goodly number are not first-rate; but our prints, about which we take so little pains, ought all to be perfect. We calculate how much we can get out of a sheet of paper, and expect every square inch to turn out right.

The drift of my observations is to show that we ought not to expect to produce good prints uniformly, unless we take great care and study attentively the conditions under which they are best produced. If this be done, I am sure we shall fail less often. We must expect less from our materials, and more from ourselves.

We depend far too much on special formulæ—acting too frequently to the letter instead of the spirit: for example, in Maxwell Lyte's toning process by phosphate of soda and chloride of gold. In his directions he says, employ *neutral* chloride of gold. Well, in commerce, the article is called neither acid chloride nor alkaline

chloride, but simply *chloride of gold;* and the majority of operators assume, therefore, it is neutral, and add it to the phosphate; and being, as it always is, more or less acid, mostly the former, phosphoric acid is liberated in proportion to free acid in the gold, and a different result is produced to what Mr. Lyte intended, and, of course, the process is all rubbish. Again, I have found persons toning with acid solutions of chloride of gold, when they believed they were working with alkaline. They have added the modicum of carbonate that their formula prescribed; but, whether it was sufficient to neutralise the free acid always present in the commercial chloride, they never tried. A given method may work well with one kind of paper and not with another. One man may produce uniformly hard negatives, and require a paper to give a soft image; whilst another gets little contrast, and must force it out in printing. In one district the water is soft and pure, in another very hard and limey; and shall one formula be applicable under all circumstances—nothing be left to the skill of the operator? and if the process fail, is the man wholly blameless?

Although the laws of chemistry are regular and certain, yet who can anticipate or give directions to another how to act under every emergency? The man who depends exclusively on formulæ—who does not grasp the spirit as well as the letter of instructions—will always be liable to derangements. I make these remarks because I so frequently hear paltry and foolish objections urged against processes and formulæ. Men should take up subjects large-heartedly and frankly, and not be discouraged easily; work themselves out of their difficulties, and not allow success and failure to depend so much on external circumstances.

The principal troubles met with in alkaline gold toning may be embraced under the following heads:—

Weakness and flatness of image.
Mealiness.
General greyness of tone.
Red spots and streaks.
Blisters.

Weakness and flatness of image is generally caused by the negative being deficient in contrast.

One peculiarity of toning by this method is, that a good print can only be obtained from a *good negative.* By the old method a passable one could be got from a weak negative by over-printing and reducing in the toning.

Generally, however, a weak and flat appearance is indicative of the silver solution being too weak. This use of a weak silver solution is one of the greatest causes of trouble. I take this opportunity of urging, as I have already done elsewhere, the use of the little instrument known as the hydrometer silver-tester, for estimating the amount of nitrate of silver in solution every morning before sensitising paper. No person knows, unless he has tested, how rapidly the silver is abstracted from the bath by sensitising paper. If objection be made to the instrument I have named, then use one of the other argentometers: they are all good and efficient—only do use some one of them.

A general mealiness.—This at first sight appears to be a defect in the albumenising; and yet it really is not so, for neither the albumen or the albumeniser is at fault, but the plain paper. It took me some considerable time to establish this fact, but I am quite convinced of it now.

A general greyness and coldness of tone.—Over-toning is the general cause of this. Not being exposed long enough in the printing frame, and being kept too long in the toning solution, will always produce this effect. The remedy is obvious. Papers excited on weak silver solutions have a constant tendency this way. Some papers are more subject to it than others, and on some Saxe papers it is too easily produced. Rive papers do not go into the inky tones, but adhere to the purple brown tints.

This defect exists principally in coarse paper. When laid on the albumen it absorbs it unequally, and when dried the surface is seen full of small hillocks and hollows arising from this unequal absorption. Now, as the gold requires a uniform surface of albumen to produce a uniform tint, it is seen that it cannot be obtained here; for the valleys, so to speak, tone first, and, as they have less albumen on them, they are finished before the hillocks scarcely begin. The print taken out at this stage is covered with minute red spots of untoned albumen. Now let it be replaced, and the toning continued till these spots are the desired colour. By this time the valleys are over-toned, and have turned to a lighter grey, and the picture has that unpleasant speckled and dotted appearance as if it had been dusted with fine flour, and in rubbing it off had got ground into the pores of the albumen. Paper having this defect should be condemned, as, although it may be modified by manipulation, it never gives good pictures. *Rive* paper is very rarely subject to this objectionable peculiarity.

Red spots and streaks.—These are often caused by the paper being badly albumenised, and are then defects of manipulation; but they are often to be attributed to irregularities in the surface of the primitive paper—some parts absorbing more than the rest; and in toning, as the gold changes the colour just in the proportion of albumen present, so the difference of colour produced registers the exact amount of albumen—the red spots, lines, and patches showing the irregular amount of albumen present. Remedy—better paper.

Blisters.—The defects hitherto pointed out belong mainly to German paper; but blisters are more prone to the thick Rive papers. The albumeniser is often charged with these, as though they were his fault. He is no more accountable for them, often much less, than the person who uses the paper. They range in size from a pin's head to a marble, or larger. They may be found in any very highly albumenised paper, and *only* in that description, and are less frequent in thin than in thick papers, being scarcely ever found in thin Saxe, and most abundant in thick Rive. These blisters usually take an oval form, and seem to be formed by a gas being generated in the body of the paper, which, by its dilation, causes the soft and elastic albumen to expand also. The paper, however, splits into two layers—one portion remaining attached to the albumen. As a rule, the greater the relative amount of carbonate of soda present so is the tendency to blisters. Many papers will blister when a large quantity of the carbonate is added to the gold, which, if the latter be used acid or neutral, will not blister at all. This quite favours the idea already named as to their probable origin; for if the soda base unite with any of the acid sizing material in the body of the paper, the carbonic acid in struggling to escape would cause the distension of the albumen surface, and thus obviously explain the presence of blisters. They generally go down in drying.

I think I have pointed out the principal defects complained of; and, apart from ourselves and our own defective manipulation, the great cause of the difficulties really lies in the plain papers themselves.

Those who prepare paper should endeavour to have some control over the sizing, so that they may guarantee a more uniform article. Many think that the faults lie with the individuals who albumenise the papers. This is a mistake. These persons, when they prepare a large batch of albumen, float thin and thick paper, Saxe, English, or Rive, all on the same albumen—in fact, treat them all alike; but the papers, as you know, all give different tones. Much less lies in the albumeniser's domain than is supposed. Speaking of albumen, there are many false notions extant. Gelatine, dextrine, gum-arabic, &c., are supposed to be added to it to increase the glaze, and many faults are attributed to these sources; whereas I believe that no substance whatever, chloride and acetic acid excepted, is added to the albumen, in this country at least. The cause of those bad smelling papers is decomposed albumen, than which few things have a more fœtid odour.

Not long since, one gentleman, who ought to have known better, burst forth with a grand panacea for all our troubles—a something which, if added to our albumen, everything was to go right, and without it all formulæ were hopelessly wrong. After this grand flourish of trumpets, and when on the tiptoe of expectation, we were told to wait a fortnight—a whole fortnight of anxious suspense, for the secret was too great to be hurriedly told— when, wonder of wonders! the mountain commenced its labours, and *a few drops of acetic acid* oozed out! This, added to albumen, was to be a cure for all the ills albumen was heir to! Jesting apart—for the matter can only be so treated, despite the oracular method of its utterance and the ponderous effort to astonish the world—whatever small merit the addition of acetic acid to albumen may have has long been known and is constantly practised. It does aid in producing limpidity, and, perhaps, tends to keep the whites clear; but it is so utterly inefficient to cope with the greater difficulties already named that, while acknowledging its humble aid, all its extraordinary merits I dismiss to the safe keeping of the gentleman who made the discovery.

In leaving the matter in your hands—for I have only attempted to open it—allow me to say that, although we have troubles with our paper now, we are not peculiar, and need not despond, for troubles with paper have always existed. In early calotype days the cry was—"Where can we get good paper?" The present are not the first complaints on printing either. When the first novelty was past, of producing prints at all, complaints were made of the foxy hue and dead sunken-in effect of our prints. Albumen was

then introduced to give a finer surface and greater brilliancy. This was all very well; but there remained the odious colour—something between brick-dust and gingerbread—when that awful mystery of "toning" was invented, and we first got glimpses of that "beauty which only leads to destruction." During that brief period how we revelled in our new-born powers! Who would not be a photographer to produce such tones, such blacks, such whites? You remember that famous "Crucifixion." What a delusion we laboured under then! It was as though we had bargained with the Evil One to have temporary good for permanent ill—selling for fleeting beauty all future permanence. It was an awful "sell," that villainous mixture of sulphur, and acid, and hypo., and gold, and s ilver, and chloride, and nitrate, and—what not;—that ominous black pool, thick with ooze and slime, and fearfully suggestive, by its very brimstone smell, of the dreadful fate reserved for the young print, just fresh from the printing-frame, full of its fresh purple beauty. See! it takes the fatal plunge deep into this black ditch, and when we see it again its virgin charms are all gone! Wan and pale, disrobed of its early attractions, there, in that dark pool, it must in penance lie, till, forgetting its former self, it emerges, sallow in hue, black in shadow—with a delusive beauty in its face, but disease at its heart; for its brief existence it remains a mockery, a delusion, and a snare, and fitting triumph for the Sulphur-demon.

Let us hope that these times are past, and that, in a photographic sense, the golden age is at hand, when our prints will be as permanent as they are true. There are some few of us, who still linger and look back fondly at the good old hypo. times, who are sceptics as to the "good time coming." As an off-set to these—the archæologists of photography—let us point to the noble monument existing in the present Photographic Exhibition, where the few sulphur-toned prints present show up, by very contrast, the splendid success of alkaline gold toning.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. I.

In commencing my series of papers on the "Practical Optics of Photography," I conceive it to be the best way in this my first to give, in as lucid a manner as possible, such elementary information as may be auxiliary to a clear understanding of the subject; for, though much has been spoken and written about the Optics of Photography, yet a great want has been felt of something more practical, simple, and applicable, than the scientific discussions and treatises which have hitherto been published. Perhaps some learned men may think it trifling or unnecessary to do so; but I believe many photographers to be as well informed as an old woman (a neighbour of mine), who said on seeing every fresh picture:—"Aw conna mak it eawt what maks t' picter! the de'il's i' that box, or else i' that dark hole!" and, on being told it was the lens, she would answer—"Heaw con t' glass do it? it ne'er sturs!" Many people have indistinct notions, but few have concise or *perfect* ideas on the matter. I therefore propose to take for my general topic the formation of the image or photographic picture, the manner of its production, and the numerous ways in which it is affected, under various conditions, and to divide and sub-divide this under separate heads.

Light is emitted from all self-luminous bodies (so called because they are the sources from which it springs)—the sun the principal one, and it is supposed from all the fixed stars, they being regarded as the suns of immensely distant systems, and also all flames and fires. After issuing from any of these sources light impinges on all bodies within its reach. These bodies are said to absorb or suck in a part of the light, and to reflect or turn back the remainder. All such bodies are called "non-luminous," because light (although it comes from them by reflection) is not originated or evolved by them. Now it is this reflected light almost universally with which photographers have to work, consequently it is their main consideration.

A ray of light I describe to be the smallest or thinnest conceivable straight line of light.

The light of the sun is generally spoken of as being composed of parallel rays, and for all practical purposes such may be taken to be the case; but in truth they are not parallel, for even the rays from Sirius, supposed to be the nearest fixed star, and which is immensely more distant than the sun, are not parallel.

When a ray of light impinges on any object, and is turned back or rebounds in any direction, that is what is meant by *reflection*.

When a ray of light, on striking a transparent body, is transmitted by it, and, at the same time, bent, or caused to deviate out of its original direction, that is termed *refraction*.

If a ray strikes the surface perpendicularly, no refraction takes place, but it proceeds in its straight course. Refraction takes place only when a ray enters or emerges from the surface of a transparent body in an oblique direction.

Reflection occurs always, more or less, whether the ray strikes the body obliquely or perpendicularly, or whether the surface be rough or smooth. If a beam of parallel rays strikes a rough or uneven surface in any direction it is reflected in numerous directions; but if such a beam is incident on a highly-polished flat surface, it is reflected in one particular direction, with the exception of what is scattered by the little roughness which always remains on the most highly-polished surface.

From these simple preliminary definitions and explanations I imagine any one will readily comprehend, from what follows, how in the world the surface of things is illumined by the operations of the light of the sun, and, resulting from this, the formation of the photographic picture.

Were it not for reflection many of our days would be nights: we should have many days and nights during the space of one day every black cloud would involve us in darkness. One side of a street or building would be in broad daylight and the other in total darkness: we should never see the beautiful silvery light of the moon. Such thoughts as these must convince every one of the inestimable value of the reflective property of light, and of the infinite wisdom of our great Creator.

When the sun's rays penetrate our atmosphere, certain variable effects are produced thereby. On a clear day, when there are no clouds and little vapour in the air, the rays come through the atmosphere, lighting up brilliantly all those parts of things on which they fall, leaving the other parts in strong shade, for want of sufficient reflective light from the sky. On a light day, when the sky is covered with white fleecy clouds, and little of the sun's direct light arrives on the earth, what becomes of it? It is reflected by the clouds and vapour in an infinite number of directions, and so illumines everything on the earth, on all sides; and, resulting from this, each visible point of all objects reflects light in every direction in which any or every point is visible. On a dull dark day, the sky is overspread with thick black clouds, or dense fog: the sun's rays are then reflected away from the earth to such an infinite extent, and absorbed, that very little light falls on the surface of the earth. Thus it will be seen that the atmosphere and the matter suspended in it are the primary means by which light is diffused in every conceivable direction; and, secondly, that light after being so scattered, falls on the surface of all bodies on the earth, by which it is still further reflected, producing, so to speak, a universal sheet of light.

It would be out of place, and unnecessary, here to enter into any disquisition on the refraction of light by the atmosphere and the matter in it, by which, in conjunction with reflection, the splendid prismatic colours, seen most frequently at the rising and setting of the sun, with those of the rainbow, are evolved.

Perhaps some persons may be ready to ask what all this has to do with the Optics of Photography, or the formation of the photographic picture? We shall see that presently, as well as all through my papers.

Now, if we take, or rather imagine, the smallest point on the surface of any object, with light *falling* on it in every direction, as before explained, it is quite evident that the light will be *reflected* in every direction. If we now place a converging lens in front of that point a certain quantity of the reflected rays will strike the lens: the form of that *quantum* of rays being a cone, the apex of which is the point of reflection, its base the lens, and its height the distance of the point of reflection from the lens, this cone of rays is refracted by the lens and converged to a point on the opposite side of it: that point is called the focus, or, rather, the conjugate focus. If the incident rays were parallel, and struck the lens in the form of a cylinder instead of a cone, they would be refracted to a point nearer the lens than in the above case: this point is termed the principal focus, or focus for parallel rays, or, more commonly, its distance from the lens is called the focal length of that lens.

In my next paper I intend to introduce a diagram by which, in that and succeeding papers, to elucidate simply the formation of the photographic picture, focus, definition, spherical and chromatic aberration; the field of view, its flatness, sphericity, &c.; and, with other diagrams and papers, to treat on copying, distortion, the acting power of light as affected by using various sized stops, and different focal lengths; clearness or otherwise of pictures, as influenced by lenses, the state of the atmosphere, distance, &c.

THE TESTING OF USED SILVER BATHS, AND THE HYDROMETER SILVER METER.

By JOHN CRAMB.

[Read at a Meeting of the City of Glasgow and West of Scotland Photographic Society, held on the 7th of February, 1861.]

I almost feel sorry to take up so much of the valuable time of this Society with the subject I have announced. Since, however, we may exaggerate its importance—there are so many subjects of much more real value lying at our hands demanding early consideration—I yet would crave your further indulgence, while I occupy a few minutes more to explain why I bring this subject forward now, and how I have been unwittingly brought into the position I now occupy.

The subject of silver meters—that is, the instruments specially prepared and advertised for the purpose of testing the strength of silver baths—had not till very lately received from me any amount of attention. As I mentioned at a former meeting I had not personally used one; for in my more immediate walk, the albumen process which I had specially in view when I spoke on the subject, it is not required that the strength of the silver bath should be estimated. The albumen film, when sensitised, tells with considerable exactness the *absolute* strength of the silver bath used, and whether it is relatively strong enough to the amount of iodide employed. I have felt this explanation necessary, as it might seem strange why my brother and I should differ so much on this question, while we were so intimately associated in the practice of the art as we are known to be. I am not sure that I shall be justified in saying we test daily all the baths in use; but if I said so, I am sure I would not be far from the truth, and that from such frequent testing we derive valuable information on which we can rely. In the course of the following paper, I shall lay before you a description of the plan my brother has long practised for ascertaining the strength of old silver baths. It is not difficult to understand, and is, we think, easily manipulated; but I am certain, if a simpler plan could be found, such as the hydrometer tester, which would indicate what we want to know with approximate accuracy, no one would more readily adopt and recommend it than we should.

About the end of November last the subject of the hydrometer tester for silver baths was brought prominently before me; and at our December ordinary meeting that meter was the subject of considerable discussion, the question being raised by Mr. M'Farlane expressing his doubt if the hydrometer test was of any value to the practical photographer. At the time that meeting was held I had a short notice on testing in *type*, expressing the same idea, but more immediately in connexion with the practice of the albumen process, which indeed was the special subject of the letter in which the notice appeared. That may explain to you why that process was so prominently in my mind in connexion with this meter question on that occasion.

You are all aware of what took place at that meeting. Ultimately, I understood every one present to give up the hydrometer meter as valueless to the practical photographer, which was just what anyone would have expected, as, to my mind, it seems that the principle on which the hydrometer tells anything at all, has but to be clearly understood, to convince any one that, to the practical photographer, such a bath tester is a snare and a deception, as I, perhaps, somewhat warmly characterised it. Of old it has been written that "a false balance and a false measure is an abomination."

At the time I made these remarks I had no idea by whom that little instrument had been recommended.

Since that time others have denounced this false measure as unmeasuredly as I did; but it has also found a champion, who comes forward and boldly throws down the gauntlet of defiance to all comers. Joined as this bold man of arms is by two brave knights, not unknown in the photographic lists, it requires no ordinary courage to risk an encounter where the odds are so unequal. "Thrice is he armed who hath his quarrel just." We need the poet's encouragement.

It turns out that, some twelvemonths ago, my esteemed friend, Mr. C. Jabez Hughes, had recommended this little instrument. He has, in consequence of the declarations of its uselessness, felt called on to bring the subject before one of the suburban London societies, by a long paper, in which he gives the results of experiments made by himself and Mr. G. Wharton Simpson with the several advertised silver meters. As I was so entirely ignorant of the connexion Mr. Hughes had with the hydrometer silver meter, or that he had ever recommended it, I hope I shall be exonerated from any personal feeling in the matter. I feel disposed to say, with Hamlet, when in a more serious difficulty, "Forgive me if I shot my arrow o'er the house and hurt my brother." Enough of introduction.

I will now proceed to give a short explanation of the plan we usually follow in testing old silver baths. Thereafter I will explain the principle of the hydrometer silver meter. Then I propose to give the results obtained by these tests applied to several of our own silver baths, and to as many as I could obtain from members of the Society; and conclude by a few remarks bearing directly on the paper read by Mr. Hughes at the last meeting of the North London Photographic Association, and the discussion which followed.

The members of this Society are probably, from various sources, familiarised with several plans of ascertaining the amount of silver in a nitrate of silver bath, which more or less partake of the character of analysis. The plan we practise is based on the known superior affinity of chlorine over nitric acid for silver. When hydrochloric acid, or a chloride in solution or otherwise, is added to a solution of nitrate of silver, chloride of silver is precipitated in the shape of a fine white powder, which may be washed, dried, and weighed, and by this means the amount of silver in the solution may be ascertained with *certainty*, if the manipulation be performed with sufficient care and exactness. We are in the habit of doing all sorts of things, on the supposition that such operations can be performed, so as to give constant and reliable results. This plan would be far too troublesome for any photographer in his daily practice; but a variation of the same thing is easy enough. Instead of observing the weight of precipitated chloride of silver, mark the amount of the chloride required to throw down all the silver in the solution. That is, carefully add the solution of chloride to the nitrate solution, just till *precipitation ceases;* and, noting the amount of chloride used, you can tell with certainty how much silver was in the solution tested. In practice, the chloride selected is common salt,—but so carefully prepared as to ensure perfect freedom from impurity, as any foreign matter in the chloride would lead to a corresponding amount of error in the estimate of the amount of silver in the solution. Mr. Hardwich, in his well-known work on *Photographic Chemistry*, gives a plan of testing old baths based on the above principle, and so have several others; and no particular claim is meant to be put in for originality in the plan.

The atomic weight or combining equivalent of nitrate of silver is 170, and of chloride of sodium 60. If you put 170 grains of nitrate of silver in say 170 drachms of distilled water, and in another vessel dissolve 60 grains of chloride of sodium in say 170 drachms of distilled water; then, suppose you add the whole of the chloride solution to the whole of the nitrate solution, you will just exactly precipitate *all the silver*. But if, instead of adding the *whole* of the chloride solution, you only add a part, say 30 drachms, how much of the silver will be precipitated? Just 30 grains; and the same thing would happen if the nitrate of silver was dissolved in a greater or less quantity of water. In other words, *every drachm* of such a solution of chloride of sodium, *added* to a solution of nitrate of silver, precipitates the *silver* from *one grain* of nitrate of silver.

There are some particulars in regard to the making up of this testing solution which it may be well to observe at this point. The chloride of sodium must be known to be pure. It must be *carefully dried*, and *accurately weighed*. The distilled water should be accurately measured. All this is quite as easy to do as described. The portion of the bath to be operated upon should be also accurately measured, and should be slightly acidified with nitric acid.

The following is exactly how we proceed in our usual practice; and, as I think it both an easy and a certain manner of testing old baths, I am sure you will excuse me the seeming repetition. Having accurately weighed out 60 grains of pure dried chloride of sodium, dissolve in 170 drachms of distilled water. A bottle which is known to hold this quantity is a more convenient and also more correct method than a large measure with a great surface, which renders it difficult to observe the exact amount. Measure a drachm of the silver solution to be tested. Render acid by nitric acid. Put this into say a two-ounce phial, wash out the measure with distilled water, and add the washings to the silver solution. If you are sure there must be say 20 grains to the ounce of silver solution, add at once as much of the chloride solution as will precipitate the amount of silver. Then add carefully, little by little, shaking each time you add chloride. Observe how much chloride you have used before you again add a quantity. At a certain point precipitation will cease: you may add more chloride to make certain. But the quantity of chloride used *before*

the point at which you observed there was no more precipitation is the quantity you found your calculation upon. Suppose a case, and say it required *three* drachms of solution of chloride of sodium to precipitate all the silver from the *one* drachm of solution operated on, proving that there were *three* grains of nitrate of silver present in the drachm of the bath tested, or equal to *twenty-four* grains of nitrate of silver to the ounce of solution.

There does not seem to be much difficulty in using such a test as this, and for all practical purposes it is sufficiently accurate. I have no wish in this matter, or in anything else that comes before this Society, to be the champion of any side, but only so far as I believe I may be able to aid in bringing out truth. I will now, therefore, notice some weak points which have been observed in the methods proposed for testing old silver baths.

It has been suggested that it requires some knowledge of chemistry to understand it, and some acquaintance with chemical manipulation to perform it with satisfaction. Though that were true, I could scarcely recognise it as an objection, since all practical photographers are, to a certain extent, practical chemists. And if any of them do not understand the nature of the double decomposition which takes place in this operation, or cannot perform so simple a piece of manipulation with the requisite accuracy, I really think they cannot too soon commence to acquire both.

But I do not think the objection has even that force. The manipulation in this testing is as simple, as easy of performance, as the operation daily gone through by every photographer; and, if any one chooses, it may be gone through successfully without knowing anything of the *principle* on which it is based, or how it *does* indicate how much silver is in a bath. Does every one who uses a hydrometer understand the principle on which it acts?

The *exact point* at which precipitation ceases, it has been objected, may be difficult to observe. Practically, we do not find it so, nor do I think it will generally.

The question has been asked:—"Can you precipitate all the silver from a nitrate solution?" Mr. Shadbolt is reported to have said, at the meeting of the North London Photographic Association:—"There is no doubt about the *fact* that alkaline chlorides do hold a portion of silver* in solution." But in the plan of testing proposed there is no *alkaline chloride*, but an *acid* solution of a chloride, which is presumed not to hold chloride of silver in solution. Thus far for *theory;* and, so far as I have tried, *fact* goes the same way. If by the plan proposed all the silver in a *known solution* is shown to be precipitated, that would be a sufficient practical demonstration; and it does so. An additional and more complete proof is to *decant* off the *clear* liquid from a silver solution so tested; then to test for silver by such delicate tests as sulphurretted hydrogen or hydrosulphate of ammonia.

My brother will now show this gone through successfully. He will precipitate all the silver from a solution of nitrate—Mr. Brown's bath, in fact—then filter the top liquor, as time will not allow us to *decant*, and he will then try this filtered liquid with hydrosulphate of ammonia, which will not perceptibly change the colour of the solution. He will then drop in a very little (the tenth part of a grain) of nitrate of silver, when you will observe the dense black precipitate formed, clearly proving that there was no silver in any shape left in solution after testing by chloride of sodium. Let me here do justice to my brother in this matter. To him you are indebted for all the results you see on the wall behind me, and to him you will have to look for the careful repetition in your presence of any one, or as many as you may choose to demand, of the experiments on which these results have been based. And though it is sufficient to make one nervous to perform anything like quantitative analyses before a society, yet I am confident you will be satisfied with his manner of doing so. I wished you to know that all I had done was to overlook the performance of the experiments, and write what I now lay before you.

The hydrometer silver meter, which is more specially the subject of my present paper, is just a hydrometer whose scale is calculated to indicate the amount of nitrate of silver in solution in distilled water. If you know from any other source that there is nothing else in the solution than nitrate of silver, it will indicate the amount with considerable accuracy: and there lies the whole question. I had the impression that the *principle* on which the hydrometer *did show anything at all*, had but to be clearly stated to convince any one it never could tell how much silver was in a solution, if we did not know whether that solution contained silver or not, or how many other substances it contained, or what amount of each or either. I pointed out to you, on a former occasion, that an old collodion bath might contain substances which would make it lighter than water—namely, alcohol or ether, or substances that would make it heavier, such as the nitrate of potash, cadmium, or ammonium, &c., or redissolved cotton, &c. Thus we have sources of error in both directions. An old collodion bath might be tested by the hydrometer tester and show less silver than there really was, in consequence of the presence of a large amount of the lighter substances—alcohol and ether. Set the same bath aside, and in time it will seem to get more silver, in proportion as the ether and alcohol evaporate, which they will do much more rapidly than the water. Very old collodion baths would gather heavy matter (not silver), but would not nearly in the same proportion acquire, or rather retain, the lighter substances—alcohol and ether. Such a bath might be shown by this hydrometer tester to contain the amount of silver which analysis would confirm.

In the printing bath there is no such disturbing cause. The error in using the hydrometer is always in one direction. The bath steadily, the longer it is used, acquires the more of heavy matter—nitrate of soda or ammonia.

Before proceeding to comment on the table of results of an extensive series of experiments with the hydrometer test, and the one I have given as that we usually employ, I may mention that we have tried all the baths by the specific gravity bottle as well as by the hydrometer. [Mr. Cramb here showed the specific gravity bottle, and explained the manner of using it.] All these results in the subjoined table have been obtained since the Journal containing Mr. Hughes's article came to hand; yet all the experiments have been so performed, and in many cases repeated so often, as fully to satisfy us that the results may be relied on.

TABLE SHOWING THE RESULTS OBTAINED BY SPECIFIC GRAVITY BOTTLE, HYDROMETER SILVER METER, AND ANALYTICAL METHOD DESCRIBED IN THIS ARTICLE, AS APPLIED TO BATHS OBTAINED FROM VARIOUS MEMBERS OF THE SOCIETY.

	Specific Gravity.	Grains of Silver per ounce as shown by		
		Specific Gravity	Hydrometer Tester.	Analytical Test.
Collodion bath from Mr. John Urie	1055	29	29	29
,, ,, Mr. A. Macnab	1059	31	31	34
,, ,, Mr. J. Bowman	1063	33	33	25
,, ,, Cramb Brothers, No. 1	1050	26	26	28
,, ,, ,, No. 2	1058	31	31	33
Albumenised paper printing bath from Mr. J. Stuart	1179	96	96	84
,, ,, ,, Mr. A. Robertson	1128	68	68	63
,, ,, ,, Mr. H. M'Farlane	1196	105	105	88
,, ,, ,, Mr. D. Brown		..	100	94
Very old ditto from Cramb Brothers	1106	56	56	31
Special test baths, from Cramb Brothers—				
A new bath for printing, made to 90 grains, 8 ounces of solution, used one day, and reduced to 4½ ounces of solution	1132	70	70	62
The same bath, again made up to 90 grains, 8 ounces of solution, used one day, and reduced to 3 ounces of solution	1117	62	62	45
The same, again made up to 90 grains, 8 ounces of solution, used one day, and reduced to 4 ounces of solution	1122	66	66	48
A new 60-grain printing bath, 8 ounces of solution, used one day, and reduced to 4½ ounces of solution	1077	41	41	32
The same bath, made up to 60 grains, 8 ounces of solution, used one day, and reduced to 5 ounces of solution	1106	56	56	44

I have here all the baths operated upon, except those which were strengthened and again used, and for additional security I got the solutions from the other gentlemen in *two* bottles; one open for my use, and the other sealed by them, to be opened here if you desire me to test them again in your presence. We cannot go over all; but a trial of one or two, if the same results be obtained, will convince you at once of the accuracy of the plan I propose, and the ease with which it can be performed, and also prove that we have made our experiments with the required care and exactness.

In the above table you will observe that in the collodion baths there is generally *more* silver in the bath than the specific gravity would indicate; but in one case (Mr. Urie's bath) it is just the same by both tests, while in Mr. Bowman's bath the error is in the other direction: the specific gravity shows 33 grains of silver, and there is really only 25 grains to the ounce, or an error of 8 grains to the ounce—proving the hydrometer tester of no value for trying collodion baths, as there is no constant ratio of error, nor is the error always in the same direction.

In the printing baths the error as shown by the analytical test is always in the same direction. In the very old bath from Cramb Brothers the specific gravity leads us to expect 56 grains of silver, while there are only 31, or 25 grains of error to the ounce, if we were to measure by the hydrometer test alone. The baths

* Chloride of silver is meant, we presume.

from other gentlemen are all in the same direction; the lowest error being in Mr. Robertson's, where the difference is 5 grains to the ounce. The new baths we made up for specially trying this question, and which we tested daily, and daily made up to their original strength, show how rapidly the bath acquires heavy matter not silver, and how it goes on doing so.

In the paper read by Mr. Hughes at the last meeting of the North London Photographic Association, there is no mention at all of the theoretical objection to the hydrometer test for used printing baths. In the discussion which followed the reading of the paper several members pointed out the source of error arising from the accumulation of nitrate of soda, ammonia, &c. In reply, Mr. Hughes does not deny this objection, but boldly appeals to his so-called *facts* as settling the question. Pretty strong faith this in his own manipulation, to found the upsetting of known principles on the results of a few experiments performed substantially by himself! Quite refreshing in fact to find such strong faith in these degenerate days of prevailing scepticism! I will not say one word here as to whether he was justified in placing so much reliance on his manipulation, even if he were certain his instruments were accurate. But let us see how many facts he has to offer. His acceptance of the "hydrometer silver meter" as a true measure of the amount of silver in an old used printing bath is founded on just *two facts*. Fact *number one* is that an old albumenised paper silver bath indicated by hydrometer tester 56 grains of silver to the ounce, and that the three double decomposition silver meters used by him gave nearly the same result; and fact *number two* is that a 60-grain silver-bath in which two or three sheets of paper had been sensitised gave similar results. There is no attempt to explain how this should be in the paper. In the discussion that followed a theory had to be propounded, and ultimately between Mr. Hughes and Mr. G. W. Simpson one is *developed*. The combined explanation, then, is, as I understand it, that very little soda or ammonia does get into the sensitising bath. Mr. Hughes says "the *fact* was overlooked that comparatively little of soda, potash, or ammonia was dissolved into the bath." Where Mr. Hughes gets the "fact" I know not. Mr. Simpson suggests how it should be—"that as the albumen was coagulated immediately on contact with the nitrate of silver, that would tend to *imprison* the soda, potash, or ammonia, and prevent its rapidly dissolving into the bath." I quote from the *Photographic News*, merely correcting an evident "literal" where "soda" is put for silver. Mr. Simpson's theory to support Mr. Hughes's so-called "fact" evidently takes for granted that nitrate of soda will be "imprisoned" by a film of albumen; that nitrate of soda cannot pass through a coagulated film of albumen as easily as through paper. There can be no formation of *chloride* of *silver* without the nitrate of silver getting to the *chloride* of *sodium*, and the same *liquid* that *brings* the one *can* and will take the other. So much for the theory to support the so-called facts. But are the alleged *facts numbers one* and *two* really FACTS? Mr. Hughes sought to make one meter prove another to be correct, but failed, we humbly submit, to prove any of them to be so. If Mr. Wood's argentometer is not capable of giving accurate results—which personally I do not for one moment doubt or deny—it cannot prove the hydrometer tester to be correct, though both agree. With *known* solutions, such as those specially prepared of ten grains and thirty grains to the ounce, none of the decomposition meters *as used* by *Mr. Hughes* gave correct results, and consequently, we would think, proved nothing at all. Besides, though they had all agreed, and shown the correct amount of silver when tried at home, the trials before the Society gave so monstrously inaccurate results when used on a known 30-grain solution, that we cannot accept them in evidence to prove another plan of meter to be capable of giving true results. I have copied out Mr. Hughes's table of results both at home and before the Society, and have them here on the wall before you. Let us look at them as applied to a 10-grain solution and a 30-grain one, both known to contain that amount of silver:—

MR. HUGHES'S TABLE OF RESULTS.

	Hydrometer Silver Tester.	Wood's Argentometer.	Horne & Co.'s Bath Tester.	Hockin's Argentometer.
A new 10-grain bath, tested at home...	10	11	12	12
A new 30 grain bath, tested at home...	30	31	29	31
A new 30 grain bath, tested at meeting of North London Photo. Association.	30	32½	27½	48

Now, observe it is much easier trying these weak baths than strong printing baths, as, in the latter, the smallest error in measuring the quantity to be tested is so much more fatal to accuracy in the one than the other.

Look along the first line 10, 11, 12—twice the same figures, but the wrong one 12 instead of 10. Horne and Hockin agree, you think; they are in some way similarly affected. No, no! these two do not again agree. Look below, and you find the one 29 the other 31, and again the one 27½ the other 48. You think, perhaps, the same instrument will nearly agree on several trials. Take Wood's first—11 on a 10-grain; 3 times 11 is 33. No! on a 30-grain solution at home it gives 31, and at the Society's meeting 32½. Horne and Co. is no more fortunate in Mr. Hughes's hands. A 10-grain solution gives 12—3 times 12 is 36; not in argentometry. A 30-grain bath is 29 tried at home, and 27½ at the meeting of the Society. Hockin's clever instrument makes 10 grains appear 12—3 times 12 is 36; only 31 by Mr. Hockin's argentometer, used by Mr. Hughes at his leisure. Before the Society it does good service—makes a 30-grain bath appear to have 48 grains of silver. Seriously, gentlemen, do you consider these results worthy of consideration? Complete befooling, to call such a tissue of contradictions facts in the presence of a scientific society!

But give him everything. Suppose all his results had for once agreed: how meagre to base a theory upon! Still more so to upset known established principles! I come before you with an array of fourfold the amount of evidence, and all the other way—all going to support known principles of chemical and hydrostatical science.

After laying before the Society the table of so varying results, and the still more varying results obtained in presence of the Society, I really cannot understand what Mr. Hughes means by such a sentence as the following:—"I am happy to bear testimony to the usefulness and practical approach to *perfection* of the gentlemen's instruments whose names I have mentioned." The advertisers of these instruments will have reasons to say, "Save us from our friends!"

Mr. Hughes gives up the hydrometer tester as inapplicable to collodion baths. In doing so he has fallen into another error. He says:—"This instrument, then, is not fitted for solutions of this character (collodion baths); but, as the errors are only on one side, even this peculiarity may occasionally be useful, for *it never can register* MORE *nitrate of silver than the bath contains—always less.*" The italics and capitals are Mr. Hughes's. I have shown you that collodion baths may be in a condition in ordinary use to indicate either *more* or *less* silver than they really contain, and have given you my edition of facts to support that statement.

There are several other points I would wish to refer to in the paper of Mr. Hughes, but time will not permit. Let me conclude by a quotation I wish applied equally to my results as to those of others, now as well as at any other time. Mr. Mayall, addressing the London Photographic Society, said, some time ago:—"Crude experiments should as far as possible be denounced and discarded by the Photographic Society. They serve only to retard progress, and, as Lehmann says, 'It were better for the cause of science had it never been weighed down by the unprofitable and crude burden of these analyses.'" *

ON A SENSITIVE DRY COLLODION PROCESS.†

By MONS. M. A. GAUDIN.

THE problem which at the present moment most occupies the attention of photographers is, without doubt, the attainment of a dry collodion process which shall equal in sensitiveness the ordinary wet method, and also admit of the film retaining its sensibility for a lengthened period. In England there exists a company formed to carry out the process of Dr. Hill Norris. It sells, at the price of a little less than a halfpenny the square inch, dry collodion plates ready to receive the impression, which have, it is said, very great sensibility. Moreover, there has been formed a society of amateurs, whose object is to make researches so as to arrive at satisfactory formulæ for a dry collodion process that shall possess the highest degree of sensitiveness. The processes experimented upon by that society rest in general upon the use of a coating applied after sensitising the film. The editor of *Photographic Notes* has written an article upon the subject tending to prove that the solution of the problem must depend rather upon the combination of bromide with iodide in the collodion.

In reading that article I thought Mr. Thomas Sutton was about to indicate the solution of the question which will be the subject of this article, but my expectations were not realised.

In writing upon the employment of iodide of silver, a method for modifying that body has occurred to me, and which I have long had the intention of trying. This I now propose describing,

* *Vide Journal of the Photographic Society*, Vol II., page 105.

† From *La Lumière*.

as I think that the vast field of inquiry which it opens up cannot be sufficiently examined except by the co-operation of experimental photographers, and to which investigation I hope to contribute my share at the first opportunity.

Every one remembers the extraordinary impetus which was given to the daguerreotype process from the day when the discoveries of MM. Claudet and Fizeau enabled them to obtain a sensitiveness fifty times greater than had been previously attainable—reducing minutes of exposure to as many seconds, and that only by causing the action of bromine to succeed that of iodine.

As soon as I became acquainted with the employment of iodised paper for the production of negatives, and also with iodised albumen and collodion for the same purpose, it occurred to me, from reasoning by analogy, that it might prove advantageous to modify these processes in a similar manner to the treatment of the daguerreotype plates; but I never made any experiments in this direction. The addition of a bromide to an iodide is an idea that has occurred to most persons. However, it is still doubtful whether the sensitiveness produced by such addition is greater. It is often believed that the sensitiveness of the collodion is thus doubled; but it would be nearer the mark to say that, in general, the addition of a bromide contributes rather to the perfection of the negative than to the diminution of the time of exposure. This is not surprising, the analogy being founded on words and not on facts—which is a very different matter, especially in chemistry, where the least circumstance overlooked changes entirely the conditions so as often to produce results quite contrary to those anticipated.

When for the collodion process we add a bromide to an iodide, we are very far from producing anything analogous to what takes place upon submitting an iodised silver plate to the action of bromine. In the collodion process the iodide and the bromide of silver are produced separately, side by side. Light acts upon each individually, and the result is the sum, or, to be more exact, the mean, of two modifications; whilst upon the silver plate it is the particle of iodide which undergoes the action of bromine. There results necessarily a complex compound which contains at the same time silver, iodine, and bromine—the whole in proportions which may vary indefinitely, the maximum effect for producing a practical daguerreotype being only ascertained after a great number of trials.

(To be continued.)

STEREOGRAPHS.

Fountains Abbey, and the Beauties of Derbyshire, by THOMAS OGLE, *Preston.*

THERE are few spots more prolific in subjects for the photographer than that on which Fountains Abbey stands; indeed, this venerable ruin appears to be inexhaustible in affording "food for the camera" of a class peculiarly adapted for stereographic illustration. It has been visited by several of our most eminent operators—Bedford, Fenton, Woodward, Ogle, and others; and when we fancy we have seen Fountains Abbey from every possible point of view, whether as a whole or in detail, we are astonished to find another and still another subject from it almost *ad infinitum*. Haddon Hall, in Derbyshire, possesses somewhat of the same protean character as regards aspect under different circumstances, and from different points of view, and we do not remember to have ever visited any other monument of antiquity with which we have been so much delighted; in fact, Derbyshire rests in our memory as one of the greenest of green spots—a locality where we obtained rest, recreation, and health, at a time when all three were much needed.

We now proceed to notice particularly some of each series above indicated; and, first, we must draw attention to those illustrative of FOUNTAINS ABBEY, amongst which, No. 195, THE CLOISTERS, *looking south*, is a gem of the semi-interior species, in which the sunlight, streaming in from the partially-open side upon the floor, is reflected upwards and inwards, so as to display the pillars and arched roof in the soft-mellowed radiance that gives such an air of calm repose.

No. 201, FROM THE CHAPTER HOUSE, *looking towards the Refectory*, is an extremely picturesque "bit" for an ordinary picture, but doubly so as a stereoscopic subject. The semicircular arched doorway, with part of the Refectory wall, is seen through a similar arch belonging to the Chapter House, itself adorned with a scanty wreath of ivy, not hiding but embellishing the crumbling stone mouldings.

No. 191, FOUNTAINS ABBEY FROM THE WEST, is a beautiful slide, though its beauty consists not in the Abbey, of which an insignificant portion is seen from a pathway leading up to a wooded elevation in the grounds; but the charm exists in the beautiful combination of some noble trees, amongst which we can distinguish the beech and the sycamore, and through the branches of which the ruin is just perceptible. Numerous scattered leaves bestrew the pathway, unmistakeably testifying of the autumnal season, even had we not been informed that it was taken at that period of the last very unpropitious year for photographers' work. It is a slide with which none can fail to be charmed.

No. 192, THE TOWER FROM THE WEST, is another most artistic production—a complete picture full of detail, half-tone, and atmosphere. The tower is slightly veiled with the leafless branches of a couple of trees, around the stems of which a dense clothing of ivy is packed as if to shelter their aged bodies from the blasts of the quickly-coming winter's winds. The ground is undulating, and on the left a thicket of evergreens and deciduous shrubs still in tolerably full leaf is noticeable, and the roadway cutting through the grass in a graceful curve. The atmospheric effect of this slide is truly beautiful.

No. 207, ANCIENT BRIDGE OVER THE RIVER SKELL, is the designation of another specimen illustrative of the glories of the vegetable kingdom; for the bridge, an uninteresting piece of brickwork, forms so minute a portion of the picture that, but for the name, it would stand every chance of being overlooked altogether. A small portion of the river acts as a central light to the composition; and from each of the banks the stately stems of many magnificent elm trees rise, their numerous branches quaintly and tortuously interlacing overhead; while the little lateral sprays, sparsely adorned with leaves after the manner of elms when lopped, bristle up the stems, and are here and there contrasted with the leaves of a stray bramble.

No. 208, NEAR FOUNTAINS ABBEY, is another charming study of foliage, or rather of woodland scenery. It is in such subjects as the one before us that we sigh most for the glories of colour. Exquisite as it is, yet in the many-tinted foliage of autumn it must have been infinitely superior to anything that the photograph can record, and must have been gorgeous in its fast-fading hues.

We now come to the Derbyshire beauties, amongst which are a series of eight, illustrative of HADDON HALL. No. 173, *from the North-West*, is a view of the edifice as it is seen when approaching it from Bakewell, and is taken from the bank of the turbulent little river Wye, which winds and twists in its course like a writhing snake; but just at this spot the waters are smooth and tranquil as a mirror. The entrance by which access is gained to the building is just hidden by the trees on the right hand. It is only a side-door leading from near the stables to the domestic offices, amongst which, by the way, are included what were once the chaplain's quarters. On the left of the roadway an empty open carriage is standing, and, as a counterpoise, on the opposite side is the omnibus, in like condition, which brings the daily party from Buxton.

No. 175, THE ENTRANCE TOWER, shows the doorway that was noticed as hidden in the last-mentioned slide.

Nos. 182 and 183 are both views taken from the west, which is the direction in which the Hall is seen by the visitor approaching from the Rowsley Station.

No. 174, HADDON HALL AND THE REMAINS OF THE ANCIENT BRIDGE, *from the West*, is, however, the slide which gives the best general notion of the spot. With a thickly-wooded background and natural sky, the Hall half hidden amongst the trees on the rising ground with the eagle tower standing out prominently, and a portion of the river in the foreground sweeping round a clump of bullrushes, it will be conceded that the elements of a very pretty landscape are existent.

No. 180, THE TERRACE, and the flight of steps leading up to it, must of necessity be the favourite. Quaint and curious, telling of old-world habits, it is a perfect romance in itself. Who that has any imagination can for a moment look on this flight of broad and shallow stone steps, flanked by the massive balustrade, without in fancy beholding the stately dame, with powdered hair and ample skirt stiff with brocade, ascending towards the cool avenue of yews by which the terrace is adorned?

We possess another excellent illustration of this spot taken in the opposite direction by Mr. Hill, the treasurer of the North London Photographic Association.

No. 171, PEVERIL CASTLE, NEAR CASTLETON, apart from its value as a picture, must always possess an interest from the association of the subject delineated with one of Sir Walter Scott's most popular works, *Peveril of the Peak*, this being the scene where a part of

the action is laid. But independently of this association, the subject is a highly interesting one; but to those who have not seen it description will give a faint idea of it.

Of THE LOVER'S LEAP, ASHWOOD DALE, there are three charming slides (Nos. 164, 165, and 166), all excellent; but No. 165, that in which the little waterfall forms a prominent object, is our favourite. Hemmed in by huge perpendicular rocks, adorned with graceful ferns, and blocked up by the large leaves of the coltsfoot, this little natural fall is as pretty in a miniature kind of way as some of the more imposing Scotch falls.

No. 159 is a VIEW IN THE SERPENTINE WALKS of the public gardens at BUXTON. These gardens are much frequented by the visitors to Buxton; in fact, they are one of the most prominent features of this favoured locality. Natural beauties, aided by art so skilfully as to let all art be concealed, are here turned to the best account. The gardens are situated on both banks of the river Wye, which though here but a small stream, has a propensity of winding about in all directions to an extraordinary degree; and, in addition to several trifling falls with which the gardens are favoured, this tortuosity of the stream allows of the introduction of numerous ornamental rustic bridges. Few who have visited the spot will be able to pass by this slide.

The last which we have to notice is No. 162, representing another celebrity in the Buxton neighbourhood—the entrance to POOLE'S CAVERN—which is perhaps more interesting as a picture than in nature.

The whole of the preceding series are executed with Mr. Ogle's well-known skill, and printed in a manner to increase his already well-earned reputation.

ON A METHOD OF PRODUCING STEREOGRAPHS BY HAND.

By PROF. OGDEN N. ROOD.

SIR DAVID BREWSTER, in his *Treatise on the Stereoscope* (London, 1856), page 135, after describing a method of projecting the picture seen by one eye, of a symmetrical, geometric solid, and of obtaining by reflection from a mirror a drawing of its stereoscopic companion, states:—"When the geometrical solids are not symmetrical, their dissimilar pictures must be taken photographically, from models, in the same manner as the dissimilar pictures of other solids."

Upon page 200 of the same work he states that though apparatus may be photographed *directly*, yet that stereoscopic diagrams can only be executed by the use of models made of *wire*, which are to be photographed in the usual way.

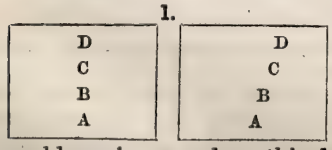
The same author, in the article "Stereoscope," *Encyclopædia Britannica*, vol. xx, 1859, p. 690, writes:—"As no artist, however skilful, is capable of executing two pictures of any individual object or group of objects, as they are seen by each eye separately, the stereoscope was of little value before the art of photography enabled us to take such pictures with the most perfect accuracy."

In addition to these statements, which would seem to imply the impossibility of producing stereographs by hand, I have not been able to learn from scientific friends nor from professional photographers that any process is now in use to effect this end, except the laborious and imperfect one of geometrical *projection*. Under these circumstances, I venture to describe a simple method of drawing stereographs, which possibly may supply a want in this department.

When we examine attentively a photographic stereograph with the aid of micrometrical measurements, and adopt the left-hand picture as a *standard of comparison*, we find that the right-hand picture is an exact reproduction of it, with one important exception, viz., that in the right-hand picture the position of an object, little more distant from the spectator than the immediate foreground, is *shifted* a small distance toward the right hand; objects farther back have their position shifted still more to the right hand, &c.

This is illustrated by fig. 1, where A is in the immediate foreground, and D in the background.

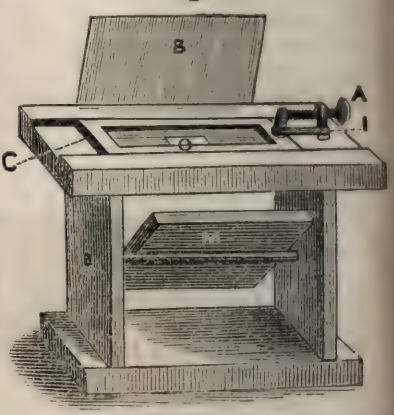
1.



Now, if we had a single drawing in perspective, of a house for example, and could produce a *facsimile* of it, this would evidently answer for the left-hand picture. If we could again reproduce this drawing on the right hand of the slide, with all the objects or points in it back of the immediate foreground, *shifted* to the right hand the proper distances, we should have a pair of pictures, which when combined in the stereoscope would give relief.

To accomplish this is the object of the machine shown in fig. 2. It consists of a board, 10 in. by 14 in., having a square opening O in its centre, 5 inches wide; this is covered by a plate of glass which is let into the wood and lies even with its upper surface. The slider C is moveable in the direction indicated in the figure: its motion is effected by the screw A, which acts against the India-rubber band I: the screw and its support are removable at pleasure. The mirror M serves for illumination; the shade B moves on hinges, and regulates the amount of light which falls on the paper while the drawing is being made.

2.



To produce a stereograph, the object or objects to be represented are drawn in perspective with ink on writing paper; this is oiled to render it transparent, the excess of oil is removed, and the drawing is attached with a drop or two of gum-arabic to the glass plate, which is completely exposed by the removal of the slider. The under side of the latter is covered with ordinary writing paper or with thin paper, and is slid into the machine till the drawing is seen under its left half, the screw having been previously removed. In this position it is fastened securely by a screw at C, and the drawing is traced slowly, line by line, until as perfect a *facsimile* as can be made by hand has been produced: this is the left-hand picture.

The slider is now moved toward the right hand a distance of 2·6 in., and the screw with the India-rubber band attached.

An object, or a small portion of an object, in the *immediate foreground* is now traced; then the screw is turned slightly so as to throw the next object, or the remainder of the first object, slightly toward the right hand where it also is drawn, &c. Thus we advance slowly toward the background, turning the screw each time that depth is to be represented. This in practice is a very simple operation, and if the displacements toward the right hand have been rightly proportioned the effect produced is good.*

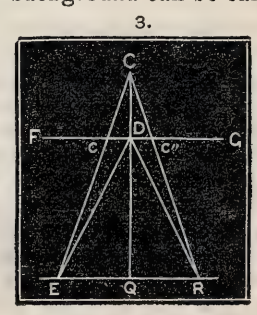
The process is also a rapid one, for it consists only in making two tracings.

The question now arises as to the total amount of displacement allowable, and as to its proper distribution.

If a number of stereoscopic photographs are examined it will be found that in those where the sum of all the displacements is not more than one or two-tenths of an inch the two images are readily united, and a good general effect produced; while in those where this quantity is as great as three or four-tenths, difficulty is experienced in effecting the union.

Taking then ·2 of an inch as the maximum total displacement allowable, the method of its distribution from foreground to background can be calculated in the following way:—

3.



Let ER be the distance between the eyes = 2·5 in., QD = 6 in. the nearest distance of distinct vision; CD = 1 in. A small object being placed at D and another at C, the eye E sees the two objects projected in the line FG at c and D; the eye R sees the same objects at D and c″. Here the total displacement, adopting the picture seen by the left eye as a standard of comparison, is equal to the distance cc″. With the proportion—

$$QC : EQ = (1{\cdot}25 \text{ in.}) :: CD : cD = \frac{cc''}{2}$$

we have at once the value of this quantity. In like manner this displacement on the line FG for 2, 3, 4 or any number of inches from Q is readily calculated.

As an example I subjoin the following table applicable to small models:—

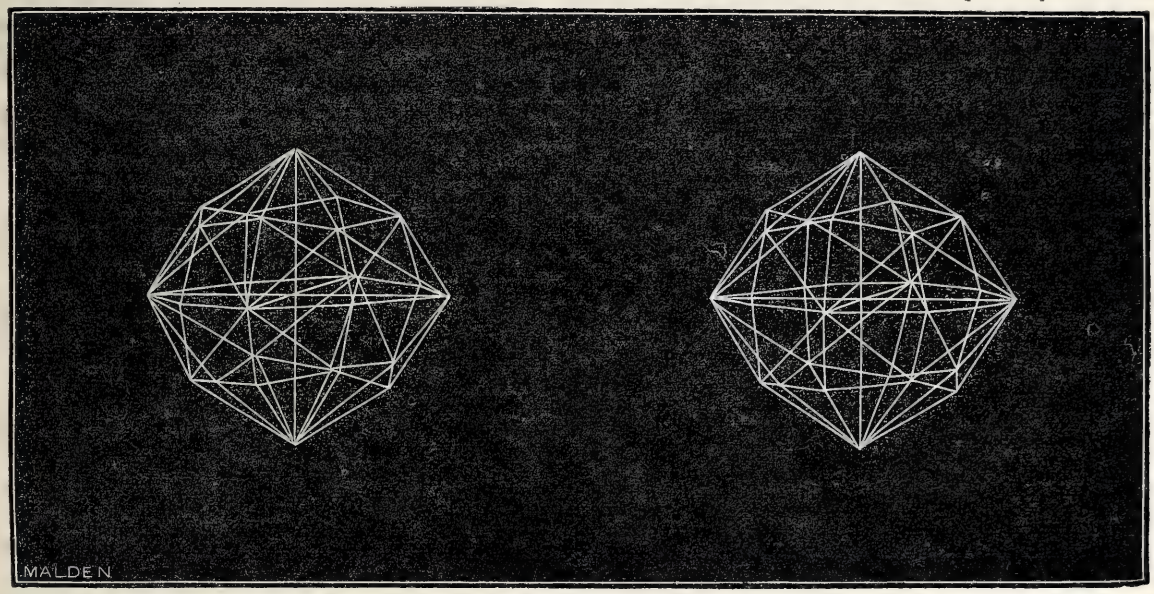
For the 19th inch above 6 inches,

* It will sometimes happen that portions of objects in the background which were hidden in the left picture are brought into view in the right-hand representation. This offers no practical difficulty, for the indicated additions are readily made.

		Total displacement.		
or for the 25th	inch.....	1·900 inch,	=	0
26	„	1·922 „	„	·022
27	„	1·940 „	„	·040
28	„	1·960 „	„	·060
29	„	1·980 „	„	·080
30	„	2·000 „	„	·100
31	„	2·016 „	„	·116
32	„	2·030 „	„	·133
33	„	2·045 „	„	·145
34	„	2·058 „	„	·158
35	„	2·072 „	„	·172
36	„	2 082 „	„	·182

As in using this table objects in the extreme foreground are supposed to be 25 inches distant from Q, we have for them not a displacement 1·900 in. but 0: for the 26th inch, viz. the 1st inch of depth in the picture the quantity ·022, &c. Thus if we know the distance from the spectators of the objects to be represented, they can be located on the stereograph. In the same manner tables are constructed which apply to objects placed at greater distances from the eye. Indeed after some practice very tolerable stereoscopic representations of many objects can be made without reference to such tables, as the annexed stereoscopic diagram of a crystallographic model demonstrates.

This process was originally devised by me for the production of stereoscopic representations of optical phenomena, which when well executed form almost a substitute for the real illustrations.



Photography for obvious reasons is not well adapted to this class of objects.

By colouring *differently* corresponding parts of two stereoscopic pictures, or by the application of colour to only one, the other being allowed to remain white or black, or by completing certain parts of the drawing only in one picture, many appearances connected with subjective optical phenomena can be represented with a degree of perfection unattainable in a single picture.

Prof. H. W. Dove, *(Farbenlehre*, p. 166) has studied the effects produced by colouring two stereoscopic drawings differently, though I am not aware that he has made this application of the results he obtained.

By slightly rotating the instrument around a line perpendicular to its axis, as was remarked to me by Prof. B. Silliman, Jr., many of these views are greatly enhanced. The phenomena of complementary colours, and many other facts of physical optics not otherwise within the reach of most students, may also, as the same gentleman has suggested to me, be rendered intelligible by the stereoscope without the use of costly apparatus. The stereoscope is thus capable, in the hands of an expert teacher, of a far wider range than was at first seen.

At the suggestion of Dr. W. Gibbs I have also made a few stereoscopic drawings of crystal models: these can be drawn by this instrument with perhaps greater facility and rapidity than any other class of objects.

The accompanying stereoscopic diagram was drawn with my apparatus without reference to tables.

Outline sketches of every description, stereoscopic drawings of ideal objects, or objects not in the possession of the draftsman, are by this process readily executed—problems evidently beyond the power of photography.

Finally the drawings thus made can be transferred to wood and stone and reproduced by the thousand.

Troy, Oct. 11th, 1860.

Exhibitions.

LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[SECOND NOTICE.]

In our number for 15th January we announced the opening of the Eighth Annual Exhibition of the London Photographic Society, and drew attention to the principal features which it presented, mentioning particularly some of the works possessing the greatest amount of merit. We have since paid several visits of inspection, and find no reason to change the opinions then expressed. There are evident signs of unobstrusive, steady progress, it is true, but no striking advances to record; indeed, the wonder rather is, considering the very disheartening character of the past season, that there are not indications of a retrograde character. It is probably owing to the unparalleled bad weather that there are so many of the old exhibitors totally unrepresented in this year's collection.

The portraits exhibited by M. Claudet, Messrs. Carrick, Lock, and Whitfield, and others, attract a considerable share of attention (particularly the coloured specimens) from the lady visitors. There are many well-known faces to be recognised—amongst them, the late Lord Macaulay, Sir David Brewster, the Lord Chief Baron, Sir F. Pollock, Dr. Becker, Mr. P. le Neve Foster, &c., &c. But passing by these, with which we have but small concern, we will make the circuit of the room from west to east, making a note of such observations as occur to us during the passage. On glancing through our note book, and comparing it with that which we took on the previous occasion for the same purpose, we are surprised to find how closely the two coincide, with one prominent exception--few or none of the works which were noticed before having escaped a second memorandum, and but few others having been added on the second occasion.

We are first arrested by two capital pictures by Mr. Wardley (Nos. 314 and 315), which, though rather too grey in tone, are both excellent photographs, taken by the Taupenôt process. The first-named, *Castle Crag, Borrowdale*, has been treated as regards the sky in the manner adopted by Mr. Mudd, and we must affirm that the additional excellence of effect imparted is well worthy of imitation. The other subject is *The Head of Windermere Lake.*

A Spanish subject, *The Doorway of the Church of Santiago* (No. 309), by Messrs. Cundall and Downes, is very artistically rendered. Mr. Gordon favours us with several subjects from the Isle of Wight. He is a good photographer, but in nearly all of his contributions we think he has erred grievously in taking them upon such large plates, and on so large a scale as he has chosen. The size, in our opinion, is a particularly unfortunate one—too large for an album, not large enough for suspending in a room. It also has the disadvantage, as regards most of the subjects delineated, of not allowing the operator to get a sufficient distance from them

to include all that it would have been desirable to have inserted, besides occasionally compelling the selection of a point of view inferior to what might have been chosen had smaller plates and a lens of shorter focus been used. We make this observation being familiar with many of the spots illustrated.

To the *Panorama of Raglan Castle* (No. 279), by Mr. F. C. Earl, we before directed attention. It is, in our judgment, a very meritorious production, cleverly printed upon two pieces of paper, and more perfectly joined than we have ever before seen accomplished where more than one sheet has been required to be used for one subject. The water in the moat surging round the angle of the edifice is very telling, and the angle itself is almost stereoscopic in its effect. From a little carelessness in the mounting and framing, some of the perpendicular lines, which really are straight, appear to be crooked; and we notice the fact in order to save the reputation of the maker of the lens by which the picture was taken.

A frame containing four subjects (No. 265) from *Canterbury Cathedral*, by Mr. S. Thompson, displays the evil effects of attempting to construct lenses possessing the quality falsely called *depth of focus*. There is a total want of brilliancy and an indistinctness pervading the whole of these specimens which are certainly not the fault of the operator so much as of the tools he has employed.

We next come to *Derwentwater, looking towards Borrowdale* (No. 264), by Mr. Roger Fenton—a work which we mentioned in our last notice as being somewhat in the style of Mr. Wilson. We are, however, constrained to admit that, on a closer scrutiny, there are several defects which become apparent, of a character to cause its position to be decidedly below that of Mr. Wilson's productions in artistic value. We have already stated that we found one important exception in the opinion derived from our former and our more recent examination of this collection—it is that we discovered a considerable number of Mr. Fenton's works that we had altogether passed over, not having been sufficiently attracted by them to ascertain the name of their producer, and certainly not recognising Mr. Fenton's style therein. They are altogether unworthy the reputation of so celebrated an artist. But for the fruit and flower pieces, to which we adverted in our former notice, we should say Mr. Fenton was unrepresented: these we still find as charming as before, despite the absence of colour, which we are fain to admit would much enhance their value. By far the larger number of landscapes displayed this year by this photographic veteran are heavy, dull, flat-looking affairs; and even the few exceptions to this description are not crisp and vigorous as of yore, but partake of a *dreamy character* highly suggestive of unreality. We fear much that Mr. Fenton has proved an inconstant swain—that he has transferred his affections from the camera to the rifle. Let us hope, as we once heard a Frenchwoman phrase it—a little questionable as to the object—*qu'il sera ramené a la vertu.*

Mr. Dixon Piper contributes, in No. 251, a *Lane Scene*, which, though a little hard, is picturesque and very suggestive. His *Study of Foliage* (No. 155) is an exquisite "bit," which we find noticed before.

Mr. J. H. Morgan has not exhibited this year so many excellent pictures as usual. They are scarcely equal to his former contributions either from an artistic or a manipulative point of view. Those on the third screen, numbered 486 to 490, are amongst the best of them, and with one or two we have no fault to find.

We now come to a mass of Mr. Heath's productions, which, though not numbered consecutively in the catalogue, are in reality all collected together. With these as a whole we are dissatisfied; yet Mr. Heath is entitled to no small amount of commendation. The printing is excellent, the subjects generally good—some of them unusually so—and the treatment, that of one with an eye for artistic excellence; but there has been one influence at work that was unconquerable, and which, with a single exception, has more or less marred the whole. This malignant spirit is no other than that which the poet has called "rude Boreas;" and certainly he has been decidedly uncivil during the exposure of Mr. Heath's plates, which all more or less display the impress of his interference. The exception alluded to does not apply to the absence of the malevolent interference, but to its success in spoiling the work—which, on the contrary, has probably gained by it, as it has induced the operator to present us with a beautiful subject in a beautiful setting, and which, in spite of the most perfect skill in vignetting, we much question whether the effect now given could have been attained but for the restlessness of the foliage when exposing the plates for taking the negative. The subject of our remarks is the *Gardener's Cottage at Endsleigh* (No. 230). We are not attributing the beauty of this picture to "an accident;" but Mr. Heath has very cleverly taken advantage of an accidental disturbing cause to effect an object which without it would have been far more difficult, if not impossible. In a few of his other plates he has carried the development of the negatives a little too far, thus introducing a snowiness of appearance into some of the high lights of the foliage.

Raglan Castle must be in the same predicament that *Punch* some time back asserted was the case with H. R. H. the Prince Consort, viz., that there is no possible way left for him to have a portrait taken without repeating what has been done before. There are numerous representations in the present exhibition of Raglan Castle, by several different operators; and, if we add to them those that have been displayed in former years, the total would be almost enough to fill the entire gallery. Amongst those that have tried their hands upon it, Mr. F. Dunn is by no means one of the least successful—witness Nos. 197, 201, and 216, as promising much merit, both manipulative and artistic; in fact, they are very charming pictures.

MM. Bisson Frères enjoy considerable reputation, and deservedly so, as photographers, and their *Alpine Views* are amongst their most popular productions. No. 198, *The Col du Géant*, and (206) *View on the Alps*, are well worth attention; but, excellent as they are, artistically considered, we have some doubt about their truthfulness, for we do not well perceive how the skies can have really presented such an appearance as indicated by the photographs, except *at midnight*, when we fancy it would have been somewhat difficult to have taken the views. Joking apart, here is a case in which veracity has been, to some extent, sacrificed to the picturesque, and we do not say unjustifiably so.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

My peripatetic habits and good fortune have again led me to the "land o' cakes" at the right moment, and with a short space of time at my command to saunter about among the results of our much-loved art in canny Scotland.

As I anticipated, there are not nearly so many productions this year as formerly; but we experimenters with the camera all know "the reason why." The past season was peculiarly unsuited for all out-door operations, and therefore I was prepared for an Exhibition of little else than portraits; but, to my surprise, these amount to less than a third of the whole. One wall is almost entirely covered with pictures of paintings and engravings by Mr. Hering, of London. They are beautiful to look at, but not "the right thing in the right place" in a photographic exhibition. They are, however, better than a naked wall.

Instead of *two* there is only *one* screen this year, which greatly lessons the hanging space, but leaves sufficient for the pictures. They are very well arranged, and few will have cause of complaint against the committee on this occasion, as none can say their pictures are too high, requiring the visitor to mount a ladder to view them, as has been hinted on previous occasions.

On looking over the list of exhibitors' names in the catalogue, there is a sad lack of those of the local professional men. Out of the list of twenty-seven firms, which I observe to be the number of photographers in the Edinburgh Directory, only three have had pluck enough to mingle with the amateurs; and these bold men are Messrs. Tunny, Moffat, and Dallas.

Out of 160 members composing the Photographic Society of Scotland, there are only twenty-seven exhibitors, embracing Great Britain—yea, even extending to Russia; for in that distant country the Society claims one of Scotia's sons as belonging to its body.

The entire exhibitors from all parts of the world are eighty-one in number, including X, Y, Z; and, notwithstanding the clanship of the nation, all that is Scottish in the Exhibition is but a mere bagatelle, and that the production of *amateurs*. A more appropriate designation for the Society would be "The Universal Photographic Society"—dropping the nationality. Be that as it may, we will now, if you please, inquire "who is who?"

Messrs. Hay, M'Craw, Henderson, Taylor, Farmer, Ritchie, Truffit, Smith, Ross and Thomson, and last, but not least, our much-esteemed friend and *confrère*, Wilson, of Aberdeen, are to be found nowhere in the catalogue; so you need not wonder that the Exhibition is somewhat sparse, and the number of subjects comparatively limited.

The principal contributors, in the order of the catalogue, are:—Messrs. Claudet, 23 pictures (*cartes de visites* and portraits); Dallas (Scottish), 23; Fenton, 30; Heath, 14; Hering, 57; Maxwell

Lyte, 20; Lamb (Scottish), 26; Moffat (Scottish), 21; Mudd, 18; Musgrave (Scottish), 15; Raven, 25; Tunny (Scottish), 21. These twelve gentlemen contribute not much short of half the pictures in the Exhibition—in all, 283 subjects. They are highly deserving of our thanks; for, without them, Scotland would not be apparently able to provide the treat for us "southroon loons" (as they say in Aberdeen) when we happen to take a run down for a few days to our favourite "Auld Reekie."

The works exhibited by Maxwell Lyte are many of them exceedingly beautiful this season. They are principally magnificent subjects, embracing fine broad, deep, fertile valleys, with lofty and distant congeries of precipitous mountains receding far away in the distance, and capped with snow.

Vernon Heath exhibits fourteen very bright sunny pictures, all landscapes, artistically chosen, embracing several beautiful views of the mansion and the surrounding park scenery of an English gentleman, with a winding rivulet, and bosky glens on each side of the stream. The farm-house standing on an eminence—the slope down to the meandering river sparsely spotted with umbrageous trees—the irregular fields, divided from each other by undulating hedge-rows—with gently rising ground receding far into the distance—form charming landscapes, which I observe some purchaser of taste has prevented going back to England; for if I am not mistaken they are all marked as "sold." They are toned and finished very much after the manner of H. White's wheat-fields that used to be admired so much in former years—an artist whose name, like many others, is this year absent altogether.

Mr. Mudd has some very similar subjects to that which gained for him the prize in the previous Exhibition. They are smaller in dimensions, but composed of the same elements. However, I think he is behind Maxwell Lyte on this occasion; but I speak generally, not having had sufficient time to examine them with that minute care which would enable me to form a decided judgment on the respective works, and I am therefore only giving you the salient, outstanding points as they happened to strike me on a first visit to the Exhibition. I shall endeavour to repeat my visit and note down some further particulars for your Journal when I can find an opportunity of addressing you at some other stage of my journey.

Mr. Lamb, of Aberdeen, is a large contributor this year, and I hope to have something favourable to say of his productions, for his and Fenton's (which are also numerous) will be sufficient to occupy another visit.

Mr. Raven, as usual, comes out strong in the wax-paper process; but he is fairly distanced in his own walk by a brother clergyman—the Rev. R. H. Witherby—who contributes four subjects. *Trinity College, Glenalmond* (No. 11), is very fine in its *chiaroscuro*, being a lofty bank of trees, in gorgeous foliage, surmounted by a noble pile of building—the light and shade being spread over it in sweet perfection. I have seen nothing else so good from wax-paper.

A striking contrast to those of Mr. Witherby are two pictures (Nos. 304 and 305) by W. Walker, both landscapes, and both also by the wax-paper process. I think, if memory serves me right, I have seen something very superior to these from Mr. Walker's portfolio before. These two are remarkably poor. In one of them is a piece of water, which might be very well represented by the head of a cask of beer in active ferment, working off the barm! That is exactly the idea it calls up to my mind. It is true, the season was very untoward; and some photographers allege that there ought to be a hospital for the wounded and diseased, and that failures often teach more than undeviating success.

I have just had my attention called to an article on the Exhibition in the Edinburgh *Scotsman*, in which there are some remarks about Mr. H. Robinson's *Holiday in the Woods* with which I cannot agree. The editor must have been in one of his reveries about the "Cardross case" or the "Edinburgh Annuity Tax" when he passed that manuscript to the printer's devil. You will no doubt have seen the article (which has been copied by one of your contemporaries), therefore judge for yourself. Thus remarks the *Scotsman:*—[Rejlander's] "admirable cartoon of the *Two Ways of Life*, which, besides containing some thirty figures, grouped artistically, was embellished with a landscape background. Excellent as that work was, it wanted the vitality and sentiment with which Mr. Robinson has imbued the present compositions, and which constitute them works of intellect." Alas, alas! the writer must have "greatly dined" when his critical eye viewed the two productions, for they are "as water is to wine," and will not bear comparison for a single moment. I am far from seeking to detract from Mr. Robinson's artistic productions in that direction. They are very praiseworthy, and if he has not yet proved entirely successful, he deserves to be, and I hope eventually will be so.

There is a large number of *cartes de visites*, by Mayall (whose case is the poorest exhibited), Tunny, Moffat, &c.; some very interesting specimens of enamel on glass, by Joubert; microphotographs, by Bryson; and a host of stereoscopic slides, by Moffat, Walker, Wilson (exhibited by Waterston), Bryson, Orange, Davies, &c.

I have now given you a somewhat general outline of the contents of the present Exhibition, and must here bring my remarks to a close. If time and business permit, I will endeavour to jot down a few more notes for your next number. SEL D'OR.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on Tuesday evening, the 5th inst., at Eight o'clock, at King's College,—C. B. Vignolles, Esq., F.R.S., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman regretted the absence of their President, the Lord Chief Baron, who prayed to be excused from taking the chair on this occasion on the grounds of ill health and the fatigue of attending the opening of Parliament. The first business was the election of their officers.

The following gentlemen were then, after some discussion on the method adopted for the appointment of the Council, unanimously elected officers of the Society for the ensuing year:—

President.

Sir F. Pollock, F.R.S., Lord Chief Baron.

Vice-President.

Professor Bell, F.R.S.

Treasurer.

A. R. Hamilton, Esq.

Council.

The Earl of Caithness.	J. G. Crace, Esq.
Warren De la Rue, F.R.S.	E. Kater, F.R.S.
Walter Hawkins, F.S.A.	G. Stokes, F.R.S.
Rev. J. R. Major, F.S.A.	H. White, Esq.
T. R. Williams, Esq.	Professor Delamotte.
F. Bedford, Esq.	J. Durham, F.S.A.
Roger Fenton, M.A.	Arthur Farre, M.D., F.R.S.
N. S. Maskelyne, F.R.S.	J. D. Llewellyn, F.R.S.
C. T. Thompson, Esq.	Professor Wheatstone, F.R.S.

Mr. Hamilton, the Treasurer, in the absence of Dr. Diamond, the Secretary, read the annual report and the balance-sheet.

REPORT.

In submitting to the members of the Photographic Society the eighth annual report, the council beg to congratulate them on the scientific position now attained by the Society, and on the general recognition accorded to it as representing photography in this country.

On presenting the report for the past year, the council trust that the efforts made by them to guard the interests of the Society, to uphold its position, and to promote its welfare, will meet the approval of the members.

The plan of throwing open the rooms of the Society in order to promote social intercourse among the members, and to afford opportunities for study, although conceived in a spirit which met with general approval, was found unsuccessful when practically tested. It was therefore determined at the last yearly meeting, that notice should be given of an intention to vacate, at midsummer, the premises occupied by the Society at an annual cost of more than £300.

Through the courtesy of the authorities of King's College, a place of meeting more suitable, and equally convenient, was rendered available. The council at once accepted the liberal terms, and trust that, both as regards expediency and efficiency, the change will meet the approval of the meeting.

The expenditure entailed by retaining the premises in Coventry Street during the first six months of the year was unavoidable; but it may be now fairly assumed that the change of premises will materially reduce the expenditure.

At the last annual meeting there was presented the report of the committee appointed to investigate and decide on the relative merits of such collodions as were submitted for examination under the only conditions to which such a committee could fairly accede. To sanction the admission of preparations without information as to the precise process of manufacture was of course unwarrantable; and to test the properties of collodion supplied in insufficient quantities to allow of thorough examination would have been merely wasting the valuable time of the gentlemen who undertook the investigation. The council can only regret that specimens of the productions of the numerous makers of collodion were withheld, but think it right to mention that every detail in the manufacture of the preparation approved by the committee has since been fully published, according to the terms of competition. The expenses incurred during the investigation amounted to nearly fifty pounds.

The Journal has during the past year chronicled in its columns not only the proceedings of the Society, together with the transactions of the Photographic Society of Scotland, but has also recorded the details of various new processes, and the latest inventions and improvements in the heliographic art, often accompanied with illustrations, and afforded information on all current subjects of interest to both scientific and practical photographers. As a mere record of the proceedings of the societies, the *Photographic Journal* would have caused a heavy annual loss to the Society, as the expense of publishing their transactions does entail on most scientific societies. The actual cost of supplying the Journal has amounted to £90 17s. 3d. The total cost of the year's printing and publishing has been made up by advertisements, which attest the almost universal adoption of photography as a lucrative art. There are now several publications devoted exclusively to photography where there was formerly only one; and to this cause the publishers attribute some diminution in the advertisements, which gives rise to the small loss on the Journal above mentioned.

The presentation to the subscribers of plates illustrating the processes of Colonel Sir H. James and Herr Pretsch entailed an expense of £20. The specimens of the photographic process of M. Joubert, issued with the number for June, were presented by that gentleman for distribution, and involved no expense to the Society.

The loss standing to the account of the Exhibition for 1860 will, there is good reason to believe, not attend the admirable collection of photographic pictures this year. The ex-

penses of the Exhibition of 1860, up to the end of January, were about £60, and the receipts £76, leaving a profit of £16 only; whereas a clear profit (allowing for *similar* expenses) has accrued of £50 during the same period of the present Exhibition, when the long continuance of wet and foggy weather especially interfered with the success of an exhibition held before the commencement of the season. The year which began so disastrously to photographers was equally unfavourable throughout: of continuous bright weather, affording both the opportunities and stimulants to work, there was literally none; and to this cause may be probably attributed the dissolution of several photographic societies which had local habitations.

It is hoped that some of the members of these societies will, in the season now commenced, join the Central Society, as the observations of photographers working in the country, and away from towns, where "houses thick and drains pollute the air," are especially valuable.

During the past year the governments of this country and on the continent have on several occasions officially recognised the importance of photography in ordinary scientific research, in advancing education, and in preserving authentic records of the stirring events of the time. The expedition which visited Spain under government auspices, for the purpose of securing photographs of the eclipse of the sun, most satisfactorily maintained the high repute of English photographers. The results obtained evinced the scientific precision and exceeding skill of the gentlemen who represented this country; and we are proud to say that Mr. De la Rue, Mr. Vignoles, and others, are members of this Society.

Photographers accompanied the brilliant campaign in Italy by Imperial command; and the choicest and rarest works of ancient art in the museums of this country and abroad are now, under Government orders, produced and made known to thousands by the aid of photography.

The Society desire to sound a note of preparation to the members of this Society and to English photographers generally. The photographic section will form an important part in the Exhibition of 1862; and the council beg to suggest that every effort should be made during the forthcoming season to ensure that this country shall be worthily represented. The earliest information as to the arrangements of the photographic section will be published in this Journal.

The council have felt sincere regret at the loss of their colleague, the late Mr. P. W. Fry. From the first commencement of the discovery, by M. Daguerre, of a process by which light was made to impress upon a silver tablet the images it illuminated, Mr. P. W. Fry became an earnest student of photography. He was amongst the small band who commenced their labours ere yet Mr. Fox Talbot's earliest *photogenic* (so-called) processes were fully developed, and before the publication of the calotype process. So earnest was Mr. Fry, that he purposely visited Falmouth to make the acquaintance of Mr. Robert Hunt, who was reported to have become one of the most successful of the earliest English photographers. Under Mr. Fry's auspices a photographic club was formed; and Mr. Cundall, who did so much towards rendering the Calotype a manageable process, and Mr. F. Scott Archer, to whom we owe the use of the iodised collodion, were frequently seen at those agreeable gatherings.

Eventually Mr. Roger Fenton, aided by Mr. Vignoles, conceived the idea of a Photographic Society. The suggestion was warmly entertained by Mr. Fry, Mr. Robert Hunt, and a few others. They were naturally desirous of enlisting Mr. Fox Talbot; and several preliminary meetings were held, at which Mr. Talbot was present. The object of these meetings was to endeavour to induce that gentleman to relinquish some of his claims, in favour of the Photographic Society. Mr. Talbot, however, claimed so much, and, although professing liberality to the young society, his conditions were in every way so stringent, that it was resolved (mainly on the representaion of Mr. Fry) to reject the offer which Mr. Talbot, no doubt, conscientiously, felt was all he could concede.

To the efforts then made by Mr. Fry and his friends must be referred the ultimate removal of the objectionable restrictions, and the freedom of photography from the shackles of the patent law.

Much discussion has arisen respecting the introduction of the use of collodion; and Mr. Fry's name has been mixed up with that discussion as if he were a claimant for the discovery of the collodion process. This Mr. Fry never was. The facts were as follows:—Mr. Hall, of Dartford, who purchased Schönbein's patent for the manufacture of gun-cotton, was the first to exhibit the film formed from the ethereous solution of gun-cotton: the collodion film so formed was used in the hospitals to protect abraded surfaces from the air. The beauty of this film attracted the attention of photographers; and many endeavoured to avail themselves of it. Collodion was spread on glass, on paper, and on other substances; and films of chloride and iodide of silver were precipitated on the collodion surface, and pictures (very poor ones) were obtained. The earliest application which Mr. Archer made of the use of collodion was for the improvement of his paper surface; for, being then engaged as a sculptor, he saw the service photography would render his art; and as such he took up the study, that he might retain resemblances of objects which he had executed, and which would pass away from his hands. At length, at one of the meetings of the Photographic Club, held at Mr. Fry's house, some really beautiful specimens of collodion pictures were exhibited by Mr. Archer, being the production of a friend to whom Mr. Archer had imparted his discovery, and who had worked with much earnestness in carrying out Mr. Archer's original ideas. Some little time elapsed, and many pictures were circulated, before Mr. Archer developed publicly his secret of *uniting a solution of the iodide of potassium with ethereous solution of gun-cotton*. Mr. Fry especially urged Mr. Archer on in his discovery, and rendered him the means of bringing it fairly before the public. By this happy discovery the collodion was made an active agent in the delicate process; and from this we date the great extension of the art of producing pictures by sunshine.

When Mr. Fox Talbot commenced his action against La Roche, Mr. Fry most zealously assisted the defendant. He left no stone unturned to bring into court a sufficient amount of evidence to show that the collodion process in no one example could be involved by Mr. Fox Talbot's specification; and very great was Mr. Fry's delight at the success which crowned his efforts. It is not necessary to speak of the many experimental modifications which were introduced into our art by Mr. Fry; several of them are recorded in the Society's journal. To the late Mr. Fry the Society owes much. He was one of its founders, and, to the period of his death, was one of its warmest supporters.

The council have to express regret that the accounts for the current year show a considerable deficit, although the general balance proves that the Society has ample means to discharge all claims against it. Certain expenses, unavoidably incurred during the year (which have been referred to in detail), will be very much diminished, or entirely avoided, in future.

In conclusion, the council have much pleasure in announcing that during the ensuing year there will be presented to each member of the Photographic Society a print selected from the present Exhibition.

Mr. Peter Le Neve Foster moved that the annual report and balance-sheet be received and adopted. This motion having been seconded,

Mr. Malone said he could hardly allow the report to pass without some comment on his part. Some allusion was made in that report to their late member, Mr. Fry; and in passing a just tribute of praise to his memory, the writers of the report had thought fit to refer to certain matters that in times past had raised unpleasant feelings, he referred to Mr. Talbot's patents. Statements were made in the report which did not appear to him to be correct, and he considered that it was written with a party spirit which he had hoped had died out long ago. He would have been silent upon this occasion had not this long-forgotten feeling manifested itself so strongly in the wording of the report, he therefore felt bound —looking upon Mr. Talbot as a friend—to offer a few observations upon the subject. For instance, the report stated that Mr. Fry began his work before Mr. Talbot's process had been fully developed. That was a gratuitous assertion, made for the purpose of exalting Mr. Fry's reputation at the expense of Mr. Talbot.

The Chairman said he thought Mr. Malone's good feeling and good taste would have prevented him from bringing Mr. Fry's name into discussion. That gentleman was dead. Mr. Malone should recollect the adage, "*De mortuis nil nisi bonum*," and throw no reflection upon him.

Mr. Malone said the maxim was a very good one, but each must judge for himself to what extent it should be applied, under circumstances like the present one. He simply wished to correct an erroneous statement of what were now historical facts, and he could assure the Chairman that he had no other object in view. The fault he found was that the writers of the report had brought Mr. Fry's name into collision with that of Mr. Talbot. It was said that Mr. Talbot's claims, if admitted, would patent the use of the sun itself. He complained that such a statement was incorrect and unjust.

The Chairman: No such statement appears in the report.

Mr. Malone repeated that the words used in the report were:—"Patent the use of the sun altogether."

The Chairman observed that the words used were:—"They declined to accept his proposals, as, in so doing, they would almost acknowledge his right to patent the use of the sun." That expression did not bear at all the meaning Mr. Malone wished to give it.

Mr. Malone said Mr. Talbot made no such claim. It was an invidious remark to make in a report of the Society, as it threw an imputation upon that gentleman that he did not deserve.

The Chairman: Nobody said Mr. Talbot made such a claim.

Mr. Malone said he must appeal to those listening whether these statements did not contain charges against Mr. Talbot; or whether, at all events, his name was not brought invidiously before the Society so as to cast odium upon him. It must be recollected that the verdict on the trial was a mixed one, and owing to the judge's want of information with regard to their science he did not place the points properly before the jury.

The Chairman said: Now you are attacking the judge who presided at the trial: this cannot be allowed.

Mr. Malone remarked that what Mr. Fry did was done for a given purpose, and in the same partisan spirit that pervaded the report. Mr. Archer's name was also introduced in a laudatory manner, calculated to prejudice Mr. Talbot's reputation.

The Chairman said that gentleman's name was not introduced in the way Mr. Malone suggested. Everybody joined in giving praise to Mr. Archer.

Mr. Malone was going to state that Mr. Archer had told him at one of their meetings that if he and Mr. Talbot had put their heads together they might have made a nice thing of it. That would show his disposition with regard to the law of patents.

The Chairman said he really must stop this discussion. Mr. Malone had commenced with the assertion that there was a certain spirit displayed in the report. He must say that no person had shown such a spirit except Mr. Malone himself. It was exceedingly bad taste on the part of that gentleman to make such observations.

Mr. Malone stood strictly on his right to speak, and he appealed to those present as to whether such a spirit existed or not. He maintained that Mr. Talbot did not endeavour to throw obstacles in the way of amateurs.

The Chairman said he recollected that at the time the general impression was that Mr. Talbot did endeavour to throw a great many obstacles in the way of amateurs, and it made a very strong and deep impression on everybody connected with photography. Mr. Talbot retracted afterwards; but it must be in the recollection of some of the members that at the time Mr. Talbot endeavoured to monopolise the art of photography.

Mr. Malone said that he had been told by Mr. Talbot himself that he did not wish to prevent amateurs practising the art, but he wished to indemnify his licensees by requiring amateurs to sign a paper, whereby they bound themselves not to practice photography for profit. Mr. Hunt did sign such a paper, and thought the requirement a perfectly fair one. He thought he ought to state such facts as these, in answer to the odium the report threw upon Mr. Talbot's proceedings. He looked at the matter historically, and any warmth he might have shown was more external than internal. He should not have mentioned the subject had it not been for the expressions used, and he should not move any amendment on the report, as his purpose was answered in making the protest he had done.

The Chairman said he thought if that alone was Mr. Malone's object, he might have obtained it by means of a very few words, and without showing the *animus* he had exhibited. Considering how highly they esteemed Mr. Malone's character, he must say he had listened to him with very great pain.

Mr. Foster's motion, "that the report be received and adopted," on being put to the meeting, was carried by a majority, but the show of hands on either side was very small.

The Chairman called attention to some photographs before him, photographed on boxwood, by Mr. Bolton; and also to some engravings, from photographs on wood, engraved by that gentleman.

Mr. Hughes read a paper *On Albumenised Paper and Alkaline Gold Toning*. [See page 59.]

The Chairman said he was sure the meeting must be exceedingly obliged to Mr. Hughes for his paper, which so judiciously mingled wit

and wisdom. The ball having been set rolling, he trusted somebody else would take up the subject.

Mr. HARDWICH stated that his reason for wishing to bring the subject of albumenised paper forward was that a superior kind of paper than any they could obtain at present was much required. More depended upon the paper now than in the old times; and he knew that operators frequently could not succeed with formulæ which ought to yield good results. He had been much struck with a former paper read by Mr. Hughes, and as he did not coincide with that gentleman's opinions he had invited this discussion. Some years ago he was a member of a committee of this Society nominated for the purpose of examining the various papers used in photography. He found the qualities of some papers totally different from those mentioned by Mr. Hughes. A paper which he found soft that gentleman considered hard and one that would be readily albumenised; whereas English paper, which Mr. Hughes stated to be soft and porous, he found hard and good. What they wanted was a mode of sizing their paper so as to produce an article suitable for the alkaline chloride of gold toning process. He had examined that process with great care, and it appeared to him to give the greatest security for permanent results; hence it was only required to determine the proper conditions of the albumenised paper to be worked in conjunction with it. Whilst working on the committee he came to the conclusion that a great deal depended on the composition of the size. By taking two different kinds of starch-sized papers he observed that there was a great difference in the colour of the photograph, and some samples of *papier Rive* he had worked with fulfilled all the *desiderata*. Albumenisers, however, complained that they could not get this paper uniform—one sample being porous, and another being hard. Some time ago a gentleman who called upon him at King's College showed him an English paper which he found nearly as good as Rive paper. It yielded agreeable tones, free from mealiness and all the other defects alluded to by Mr. Hughes. He did not know, however, whether this paper was uniform; but surely what had been done in England once could be done again, and if so, the paper might in future be obtained at home, instead of their having to go abroad for it. He was informed that the water-mark was stamped on all paper bearing the name of "*Rive*," whatever its composition might be.

Mr. HUGHES suggested that that fact might account for the different opinion Mr. Hardwich and himself had formed regarding the character of the same paper.

In reply to a remark by the Chairman, Mr. HARDWICH said the nature of the fibre, whether linen or cotton, would alter the effect, but not so much as the composition of the sizing. He should try to obtain a tone of red from the paper, which, being corrected by the blue colour of the gold process, would give the warm purple tone they so much admired. He had found that an acid entered into the composition of some commercially-albumenised papers; and the question then arose, if acid were to be used, which acid was the best for the purpose? He had tried two or three experiments with the view of ascertaining the effect of various acids upon albumen. He found that citric acid liquefied the albumen, so that it would even run through filtering paper readily, and yet left a strong gloss upon the paper. It must not be supposed that limpid albumen gave less gloss, or that by the admixture of gum to thicken it, would yield a better gloss, the fact being just the contrary. Exposing the albumen until it became sour would also make it run easily and give more gloss; but it was not so suitable to work with as when acid was added to fresh albumen, on account of the decomposition and disagreeable smell. In adding acid great care must be taken not to use too much, as it interfered with the toning process. He had, however, found that the commercial paper containing acid toned sufficiently quickly, and gave pictures of a good colour, although the paper he experimented on did not tone so quickly. He gave up the use of citric acid after a few trials, since it appeared to him to interfere with the toning, at least with the paper he then used. He desired to obtain, if possible, a plain paper that coloured quickly, and then to use an albumen containing acetic acid, which would not interfere much with the toning. They must agitate for a better supply of paper; at present they were entirely in the hands of individuals who did not understand what photographers wanted.

Mr. MALONE said he had taken some active steps with regard to the paper used in photography, having been engaged in experiments at a paper mill some years ago. Nothing could be done by individuals in the matter, and therefore it was necessary that the Society should take the matter up. The difficulty was that manufacturers did not consider it worth their while to put all their ordinary course of business out of order for the purpose of making the necessary experiments required of them by photographers. In England we were not in the habit of making these kinds of paper. If we could but get the foreign makers to do something for us it would be a great gain; but they would not do so. They kept secret their method of sizing, on which a great deal turned. Our own paper was sized with alum and gelatine, whereby atmospheric causes sometimes spoiled its effect. A resinous soap was used by some French manufacturers; and it was just possible that on coming into contact with acid the resinous matter, which resisted water, would be liberated unevenly into the paper, and the albumen would not be so likely to take upon the resinous surface. That might be the reason of some of the paper not working properly. If they treated such paper with a weak alkaline solution, which would alter the nature of the surface and act upon the resin, they might then try whether the albumen would take better. Those who prepared the albumenised paper for sale differed as to whom they considered the best makers. In his judgment, therefore, the Society ought to endeavour to induce some paper manufacturer, possessed of adequate machinery, to take the matter in hand. The paper might be made from linen, or what was called "government canvas." There was some difficulty in using that paper sized by gelatine, and it might perhaps become necessary to introduce the size into the pulp. He thought the French put the size into the pulp, and then passed it through rollers, so as to iron down the fibres, and thus give a smooth surface. This plan, in his opinion, was much better than putting the sheet of unsized paper into the size; and, if possible, we should adopt that method. He was afraid that if they did not get up a joint stock company of their own they would never obtain a good paper. He must, however, say that, in his opinion, many of the bad results complained of arose out of the neglect of the old and recognised method of working. He had seen albumen used in such a state of putrefaction as to be of a buff colour, and in that state the sulphur and phosphorus it contained must be liberated by decomposition. He knew that pictures sent into the trade were frequently taken upon paper prepared from albumen in that condition for the sake of the high gloss and the rapidity of printing attained by its use. This sort of pictures were likely to fade, and were in fact almost fraudulent. Good paper albumenised with fresh salted albumen, would give every quality of surface they required. Then with respect to the proper quantity of nitrate of silver to be used in the bath. Photographers frequently, perhaps from a notion of economy, did not use a sufficiently strong solution. Sometimes a solution of 100 grains strength was used to obtain a rapid effect; and good effects might be obtained from a bath of 60 grains to the ounce, but in general it was far weaker than it ought to be. Mr. Hughes had mentioned sulphur when referring to fixing and toning. He was not going to advocate sulphur against gold, but he must say that there were unfaded pictures toned by the old process staring them in the face; and it was not yet absolutely proved that the alkaline gold process was permanent, as any portion of silver remaining in the picture not replaced with gold would be attacked by sulphur. He might add, in favour of the old process, that there were unfaded pictures now in existence that were toned by it in 1844.

The CHAIRMAN: So that the devil is not so black as he is painted.

Mr. SHADBOLT was surprised to find himself in a very insignificant minority with regard to the present discussion, as he well remembered that his colleague on the printing committee, Mr. Hardwich, had formerly thought well of a specimen of English paper which he (the speaker) considered the best of all the various kinds examined by the committee. This opinion was one of the few which he shared also in common with Mr. Sutton. The paper to which he specially made allusion was that made by Mr. Hollingsworth, and sized (he believed) with gelatine. He admitted, however, that paper sized with gelatine was more troublesome to manipulate, and that was one of the reasons why a preference was shown in favour of starch-sized paper. The former was more difficult to albumenise and more difficult to sensitise than the other, in consequence of its tendency to curl up when laid on the bath. A great deal had been said about mixing a small quantity of acid with the albumen; but from experiments he had made years ago, he thought it best to proceed in exactly the contrary direction, by mixing a small quantity of free ammonia with the albumen. That mixture gave a high gloss, and did not cause the albumen to run in streaks; but, in using it, especial care should be taken to hold the paper before a brisk fire as soon as it was removed from the albumen so that the drying might proceed rapidly. He wished also to refer to a paper read some time ago at Manchester, by Mr. Mabley, who experimented rather extensively upon various subjects connected with printing. That gentleman therein stated that papers sensitised upon a nitrate of silver bath, rendered slightly acid with *nitric acid*, were found to tone more readily in the subsequent operation than those excited in either a neutral or alkaline silver bath.*

Mr. HENRY BOHN had great experience in all varieties of paper, but did not know before that evening there was any difficulty in obtaining the proper description of paper for photographic purposes. He was sure that there were manufacturers who would be glad to undertake the necessary experiments for discovering the best material and method of making it. It ought to be made from pure white linen rag, and to be sized probably with vellum size, which, although largely used by foreigners, was not much used in this country on account of its expense and the difficulty of procuring it in quantity. They could get first-class paper from three makers, whose names he would communicate privately to any member who desired to know them. In case of difficulty he would advise the members to make experiments by sizing the paper themselves, as it was a very easy process. He could tell them that the foreign paper was not usually made of pure linen—that there was not one ounce that was not made up, and he wondered how they could use it at all. There was a great deal of woody fibre in it, which, from causing hard spots, was inconvenient to the photographer.

The CHAIRMAN thought it would be strange if, with a great demand and without any great restriction as regarded price, they could not induce manufacturers to make them a paper suitable for their purposes. But photographers should specify beforehand what they wanted, or, at all events, state what must not enter into the composition of the paper. It might be a question whether some of the newly discovered materials for making paper would not answer their purpose exactly. For instance, might not straw paper be made useful?

* See page 128 of our last Volume.—ED.

Mr. Bohn said straw paper would not do at all: it must be made either of linen or cotton, or half linen and half cotton.

Mr. S. Davis, in referring to the hydrometer alluded to by Mr. Hughes for measuring the strength of nitrate of silver solutions, said he objected to it on the ground of its uncertainty when any substance was present to decompose the nitrate. The most certain and simple way of ascertaining its strength was to dissolve eighty-eight grains of chloride of sodium in sixteen ounces of water, half a drachm of this liquid being exactly sufficient to convert one grain of nitrate of silver into chloride, an ordinary glass minim measure being all that was required for the purpose. By adding a single drop of chromate of potash to the nitrate a red colour would be imparted to it, which would vanish the moment the entire conversion took place, and thus the exact amount of silver salt in the bath could be estimated with certainty.

Mr. Thomas said he objected to the use of English papers on account of their being all sized with gelatine, and thus, as a rule, they did not give so good a colour when working with them as the foreign papers, which were sized with starch. He always used *papier Saxe* for albumenising, which, although rather difficult to manage, gave an agreeable colour. The best paper ought to be hard, not very absorbent, and should, when shaken, have quite a metallic ring. He might mention one point respecting toning by the alkaline gold process, namely, that the more albumen there was used the greater difficulty there would be in obtaining the darker tints. He always used pure albumen with sufficient water to dissolve the chloride, and modified his effects by adding more or less water. It was also necessary to pay particular attention to the temperature when albumenising the paper; for if the paper were kept in a damp place, and then brought into a hot room, the albumen would be unequally absorbed, which would probably account for the faults usually attributed to defects in the paper. He always albumenised in a temperature of 70° and he had never experienced any of the ill effects complained of. Something might be due to the condition of the eggs used, and to the method in which they were broken, as great care ought to be taken not to allow any particles of the germ or yolk to be mixed with the white. In using the *papier Saxe* care should be taken to albumenise the proper side. In answer to Mr. Hardwich, he said he found he got on very well without the use of acid, and therefore he did not use it.

Mr. Shadbolt asked Mr. Thomas what he called "an agreeable colour," when he said such was given by a starch-sized paper, as he found there was great difference of opinion on that subject, and he regarded that produced by Hollingworth's paper as preferable to the cold tone of a starch-sized paper?

Mr. Thomas replied that that was a matter of opinion: he might refer to Mr. Bedford's pictures in the exhibition as the kind of tone he admired.

Mr. Sutton exhibited some stereographs, which he said might be considered as good types of various methods of printing and toning.

Mr. Hughes thought it would be a pity to close the discussion that night, as he had purposely omitted several important points in his introductory paper, in the hope that other gentlemen would take them up.

The further discussion was then adjourned to the next meeting.

The proceedings terminated with a vote of thanks to the Chairman.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held on Wednesday evening, the 30th ult., at Eight o'clock, at Myddleton Hall, Upper Street, Islington,—George Shadbolt, Esq., V.P., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman announced the following contributions to their Portfolio:—Seven copies of views in Devonshire and North Wales, presented by Mr. Bedford, and a photograph presented by Mr. How. He had also received a letter without a signature—he fancied from a new member—complaining that the portfolio was seldom to be seen. He begged to state that any member could have it for a week, on application to the Secretary, unless it were previously engaged by some other member, in which case the applicant's name would be placed on a list, so that he might have it in the order of his application.

Two copies of engravings, photographed by Mr. Lauder, were exhibited—one toned by the old acid and hyposulphite bath, and was three years old, and the other was toned by the alkaline gold process. A vote of thanks was passed to Messrs. Bedford, How, and Lauder for their contributions.

Mr. Woodward, of Nottingham, and Mrs. Champian, of Eltham, Kent, were proposed and declared duly elected members of the Society.

Mr. Hughes read a paper on *How to Ascertain the Amount of Silver in a Nitrate Bath; with Remarks on Silver-bath Meters.* [See page 43.] At its conclusion he remarked that in relation to the experiments that he had recorded, so important did he consider them, and so anxious was he to avoid error, that he had asked the assistance of a gentlemen of undoubted qualifications, Mr. G. Wharton Simpson, who kindly gave him the best part of one day to aid in verifying and working them out.

Mr. Hughes then proceeded to test the different instruments, and was aided by the Chairman, who examined the quantities of each of the solutions used, and recorded the results obtained. The silver solution tested was the new 30-grain one previously experimented on.

The hydrometer tester registered exactly 30 grains, Mr. Wood's argentometer 32½ grains, and Messrs. Horne and Thornthwaite's bath-tester 27½ grains to the ounce. Mr. Hockin's instrument appeared to be rather out of order, and therefore the result shown was disregarded.

In conducting the experiments Mr. Hughes availed himself of Mr. Heisch's suggestion of adding to the silver bath a minute quantity of solution of bichromate of potash before the addition of the standard solution. This caused a deep red precipitate of chromate of silver. The saline test was then added with confidence, for the colour of the precipitate showed exactly the point when to cease; the last drops required changing it from a pink to a clear white. This additional test was as much admired for its elegance as for its certainty. Messrs. Horne and Thornthwaite, in their published directions for using their instrument, recommended this addition, as well as pointed out the exceptional circumstances under which it ceased to be efficient.

Mr. Hughes explained that the results obtained in their presence were certainly less accurate than those performed by Mr. Simpson and himself in private: this he attributed to the difficulty of reading off the glass tubes by the gas light. In Mr. Hockin's instrument it was very necessary to be careful, as the standard solution being more concentrated, every drop lost caused serious error.

Mr. Hughes next experimented on a portion of a negative nitrate bath, which, it was stated, did not work well. It was supposed to be of a 30-grain strength, but, when tested by Wood's argentometer, was found to contain only 26 grains. Before he left home he had tested it, and made it 22½, so that, taking a mean of the two experiments, he must judge it to contain 24¼ grains, and this he thought was very probably one of the causes, if not *the* cause, of its not working well. In another bath, also supposed to be a 30-grain one, which he had examined because it did not work in a satisfactory manner, he found the strength to be 25 grains. He thought that many times when baths were supposed to be out of order, the main trouble arose not only from the accumulation of organic matter, but the deficiency of silver also. In such cases one of the standard solution tests must be used, as the hydrometer could not be relied on in consequence of the ether and alcohol. He regretted that none of the gentlemen were present whose instruments he had used. He had forwarded notes of invitation, and acquainted them with the subject of the paper. Messrs. Hockin and Wood had informed him that they were prevented by previous engagements.

Mr. Barber inquired from Mr. Hughes whether the hydrometer would give a correct result when placed in a 30-grain solution of nitrate of silver, to which 20 grains of chloride of sodium had been added (thus forming a solution of 10 grains of nitrate of silver, and an equivalent of nitrate of soda)?

Mr. Hughes said he thought that was a severer test than would occur in everyday practice, and that so long as no other substances were present than those that occurred from the customary decompositions, that instrument might be relied on. He did not find that foreign bodies accumulated in the bath sufficiently to disturb its specific gravity.

A vote of thanks to Mr. Hughes for his paper, and to Mr. Simpson for his assistance, was then carried.

The Chairman wished to draw attention to Negretti and Zambra's hydrometer, the scale of which was four times as long as that exhibited by Mr. Hughes, and was therefore more delicate in its operation. In answer to inquiries from Mr. Hughes and Mr. Shave, he said it could be used with an ounce of solution, and that the capillary attraction was so slight as not to affect its accuracy. He might also say that it would be an advantage if a graduated measure were supplied with Wood's argentometer to be always used with it. It was possible that Mr. Hughes might not have used the same measure that evening as he did when conducting his former experiments, and that might partly account for the variation in the results.

Mr. Burr said he considered Wood's argentometer, which approached the form used by Gay-Lussac, to be the most useful instrument. If Hockin's instrument were liable to derangement on this occasion it would be equally liable to accident on other occasions perhaps, when most wanted. He thought Mr. Hughes's paper would have been far more valuable if he had accurately tested his chemicals before commencing his experiments, and had afterwards carefully analysed the products. The relative approach to accuracy of the different instruments would then have been more clearly shown, and the cause of the variation in the results might have been ascertained.

Mr. Simpson explained that they had applied Mr. Heisch's test, which is based on Gay-Lussac's, to their chemicals before using them.

Mr. Hughes stated that Mr. Burr did not appear to understand the purpose of the paper, which was, not to deal in the refinements of chemical analysis, but to test the usefulness and accuracy of the instruments supplied for estimating the value of silver solutions. His early experiments had been of a very delicate nature, but he had not reported them; for he found that unless standard weights and measures of the most perfect accuracy were used, these tests were even more liable to error than mere approximate methods. He had placed himself in the position of a photographer who wanted to know the strength of his solutions, but had neither time nor means to spare, and only the ordinary apparatus to be found in his operating room. He had therefore used ordinary good nitrate of silver, and the usual graduated measures.

In reply to a remark made by Mr. Louch, that Wood's argentometer might be applied in testing the amount of adulteration in the nitrate of silver sold in the shops, Mr. Hughes observed that, in the hands of an inexperienced person, such a test, possibly performed in a clumsy manner,

as scarcely fair to the shopkeeper. They had seen that evening that, ven with care being taken, when an experiment was performed twice ith the same solution there might be a variation of 2½ grains in 30, hich in the ounce of silver would amount to a sufficient quantity to raise groundless suspicion that the seller had been guilty of fraud.

Mr. QUIN said the best and most simple test he was acquainted with r the purity of nitrate of silver was to dissolve a few grains in distilled ater, and, after precipitating with hydrochloric acid, to evaporate a drop f the supernatant liquid on a clean glass plate, when, if pure, no trace of rystallisation would appear. The perfect solution of the precipitate in mmonia would prove the absence of lead and mercury, the only impuri- ies with which it would be likely to be adulterated. The principal ontamination he found consisted in organic matter. He experienced reat trouble from a bath made from a sample of fused nitrate which was old in round cakes, one ounce each, and sent out in a sort of pill box. his silver he had no doubt acquired contamination by long-continued ontact with the paper box in which it was packed and sold.

Mr. HILL, and some other members, referring to Mr. Hughes's last ex- eriment, did not think the weakness of the solution of the negative bath ad anything to do with its unsatisfactory working, as they had used aths of even less strength without experiencing any ill effects.

Mr. DAWSON thought the hydrometer was the best test for ascertaining he strength of a new solution; but he wished to know how it would be ffected by the presence of nitrate of soda or nitrate of potash, which ould undoubtedly affect the specific gravity of the liquid?

Mr. HUGHES replied that if large quantities of nitrate of soda or potash ere present of course the specific gravity would be affected, inasmuch as 0 grains of nitrate of silver registered 30 on the hydrometer, and 30 rains of nitrate of soda registered 20. But nitrate of soda did not ccumulate in baths to the extent supposed, as a great portion of it re- ained in the pores of the paper, and some was carried away in the dhering solution. In practice he had not found it to accumulate to the xtent to interfere with the specific gravity communicated by the silver alt; and perhaps the best answer was to refer to the reported experi- ents, particularly of the bath that had been in use for some years.

Mr. DAWSON thought very little nitrate of soda would remain in the ores of the paper on account of its great solubility in water. With the xception of that portion contained in the fluid adhering to the paper it ould all remain in the bath.

Mr. SIMPSON said the moment the albumen came in contact with the itrate of silver it became coagulated, and the nitrate of soda was to a onsiderable degree imprisoned and prevented from passing into the bath.

Mr. DAWSON said in preparing his baths he poured in the nitrate of ilver until the hydrometer registered the required strength. He con- idered that method superior to weighing the nitrate. He did not find hat plan answer so well when adding fresh nitrate to an old solution, as he specific gravity increased to a greater degree than the quantity of ad- itional nitrate would warrant. He had also found that the nitrate of oda in an old solution stripped off the albumen in flakes, and, until he ad experimented upon the point, he thought that was owing to the eakness of the nitrate of silver. Nitrate of ammonia would produce hat effect.

Mr. HILL said he had experienced that inconvenience also. The albu- en had dissolved in the fluid instead of coming off in flakes.

Mr. DAWSON said that must be owing to the presence of ammonia. ery likely his paper was salted with chloride of ammonia. In his own ase, perhaps the most reasonable explanation was that the chloride of mmonium decomposed, and left the albumen in a really alkaline con- ition, and which therefore dissolved when it came in contact with the ilver solution.

The CHAIRMAN announced that, at the next meeting in February, the fficers of the Society and of the Committee for the ensuing year would be ominated, any member being at liberty to propose names. Out of the ersons named six would be selected.

Mr. HILL stated that at the next meeting Mr. Barber would read a ommunication *On the Purification of Nitrate of Silver*.

The proceedings terminated with the usual vote of thanks to the Vice- resident for his services in the chair.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A GENERAL meeting of the members of this Society was held on the 29th lt.—Mr. W. B. Osborn, the Vice-President, in the chair.

Some formal preliminary business having been disposed of, the CHAIR- AN opened the discussion upon Mr. Rejlander's paper [see page 29] by eferring to the remarks made by that gentleman relative to the scum on he surface of the bath.

Mr. TURNER said he was sorry that Mr. Rejlander was unavoidably bsent, as he wished to have that gentleman's opinion upon many points. He (Mr. Turner) had worked for six or seven years, but had never seen he scum on the bath until within the last six months, when, in con- equence of the coldness of the weather, he had had a stove erected in his oom. Since that had been put up, owing, he supposed, to the fumes of sulphur that were generated by it, he had frequently detected the scum. He proceeded to say that he believed that almost all the difficulties and horrors that photographers had to contend with were attributable to dirt and want of cleanliness. For his own part, he made a point of filtering his bath every night, and he possessed an apparatus which was very efficient for the purpose. It consisted of a funnel fitted into a glass jar, a plug of cotton wool being inserted in the tube of the funnel. This effectually filtered the bath. On each side of the jar also was a tube on the syphon principle, and, by blowing through one, the bath could be filtered by means of the other, without disturbing the sediment that might have collected. He believed also that the want of care in cleaning the glasses was a very fruitful cause of this scum forming. He generally cleaned his glasses on both sides with nitric acid and water.

The CHAIRMAN concurred in Mr. Turner's remarks as to want of cleanliness, and said he had often observed that amateur photographers considered it quite sufficient to clean one side of the glass only.

Mr. TURNER called attention to one point in Mr. Rejlander's remarks, having reference to throwing down the silver as chloride in weakened baths. He had never done this. He maintained the strength of the bath by fresh additions, as he considered the old baths possessed qualities which new ones could not have. He was certain that there was more in the making up of a bath than many persons supposed.

Mr. HULME, as a dealer in nitrate of silver, complained of the very dirty condition in which it was often sent out by the manufacturer.

Mr. TURNER said that at the last meeting Mr. Rejlander left two glass plates which he complained of as being naturally dirty, and as resisting all efforts to clean them. He (Mr. Turner) cleaned one with nitric acid and water, and took a portrait of the Honorary Secretary upon it. Mr. Hart, he added, had cleaned the other with levigated emery and water, and had taken a picture upon it.

[The plates were handed round, together with negative prints from them. The plates, which were previously very curiously marked—the one with a paper mark and the other with the figure 2—were now quite clean, and free from any markings whatever.]

Mr. BREESE, in answer to a remark from the chairman respecting the varying quality of glass, said that in looking over some negatives a few days since he found six which had cracked all over, and upon examining them he perceived that they were all upon *white* glass, while those taken upon glass with a green tinge had remained perfect. He was of opinion that the white glass absorbed moisture from the atmosphere, and, acting upon the porous collodion film imprisoned under the hard varnish, caused it to sweat and finally to crack the varnish. He was borne out, he thought, in this opinion by the fact that he had one negative kept in the same box (which was on white glass, but unvarnished) which had remained perfect.

The Chairman observed that he could endorse the last speaker's opinion, as he had frequently noticed this defect—vulgarly called "sweating"—in colourless or white glass.

Mr. TURNER said he had used the colourless plate and never found this defect. He had negatives fifteen months old which were quite good.

Mr. PLANTE had frequently noticed veins in the white glass. His own experience would corroborate that of Mr. Breese. He had often used both kinds of glass indiscriminately, and his practice was, previous to varnishing the negative, to clean off a narrow rim all round the glass; then to warm it and pour the varnish all over it. By this means moisture was prevented from creeping under the film; and yet with all these precautions he had frequently found the films on the colourless glass, which films from lapse of time were split all over. He had also negatives which, quite clear when done, were now marbled all over, probably from the same cause. He should like to ask Mr. Breese, whose instantaneous productions he had been so delighted with, whether he had met with the same result in his rapid pictures?

Mr. BREESE said he had referred to instantaneous pictures.

Mr. PLANTE felt convinced, after a long experience, that the generality of photographic horrors might be traced to carelessness and want of cleanliness. If photographers would but exercise scrupulous cleanliness in all their operations, three-fourths of their troubles and difficulties would disappear. He found the best method of cleaning glass plates was to place them upright in a solution of one part sulphuric acid, four parts water, and after some hours to neutralise the acid with best chalk. This process covered the glasses with a very fine deposit of chalk, which, when rubbed off, gave a brilliant surface to the glass. He generally used boiled rain water for washing purposes.

Mr. BREESE said he found nothing better than plain water, and plenty of it.

Mr. TURNER observed that he often used weak solution of cyanide. He related a curious circumstance connected with the development of a negative, in which the image of the porcelain bath had been printed on the plate by reflection from a sudden opening of the door of the operating room.

The discussion then turned upon varnishing, and the cracking of films under some varnishes.

Mr. BROWN thought that the nature of the collodion had very much to do with it

Mr. BURR made a very useful suggestion. He had, he said, frequently found the varnish crack on his negatives, and he adopted the simple expedient of following the line of the crack with a camel-hair pencil dipped in Sœhnée varnish. By this means he had saved very many valuable negatives.

The discussion then assumed a conversational form; after which the Chairman announced that the prints purchased by the council for presentation to the members would be placed on the table for selection.

A number of choice and beautiful pictures were then displayed, the allotment being—one large print, two small ones, or six stereographs, for each member.

The Honorary Secretary then announced that Mr. Robinson, of Leamington, had with great liberality forwarded one of his photographs for presentation to each member of the Society. These pictures, all of them of the *genre* class, were most of them very beautiful. They will be highly esteemed by their fortunate possessors.

The meeting, which was protracted until a late hour, was brought to a conclusion by a vote of thanks to Mr. Robinson for his very handsome present.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting of this Society was held on Wednesday, the 6th inst.,—Mr. Wardley in the chair.

The Secretary read some correspondence in reference to the course to be taken by the Society at the approaching meeting of the British Association. After a conversation on the subject, the following gentlemen were appointed representatives:—The Secretary, Mr. Mudd, Mr. Neild, and Mr. Sidebotham.

The Secretary then read a letter from the Secretary of the Royal Institution, proposing a spring exhibition of photographs, under the management of the Society.

The consideration of the question was adjourned until the next meeting.

The Chairman asked whether the panoramic lens had found its way to Manchester?

Mr. Hooper stated that he had received one of them with the intention of giving it a fair trial; but he found it so unsatisfactory that he had been obliged to return it. This might not, he thought, be the case with all lenses of that construction; but he feared that the difficulty of getting rid of striæ was almost insuperable. Mr. Ross had now, however, he was told, taken the matter in hand, so that they might expect a settlement of the question. He (Mr. H.) spoke highly of Grubb's lenses: he had seen pictures taken by them including an angle of 60°.

The Chairman observed that much had been said lately about the centering of lenses; but the error that was likely to occur was of very little moment in those for landscape purposes. The subject of lenses being before the meeting, he wished to call attention to the importance of devising some method of expressing the capabilities of the various combinations now before the public, as compared with the ordinary landscape objective. The practice of measuring the focus from the back lens of a compound portrait, triplet, or orthographic, was erroneous in principle; consequently photographers, unacquainted with this fact, were liable to be led astray when they hear of a 3¼-inch focus lens (compound form) covering a circle of nearly five inches. Upon trying a lens of this character, they would find the size of image and circle of good definition, equivalent to an ordinary meniscus of about 4½ inches focus. It would be much better if the compound lenses were expressed in equivalents with our old landscape lenses.

A vote of thanks having been passed to the Chairman, the members were occupied in exchanging photographs, under the new plan adopted by the Society.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held in the Religious Institution Rooms, on Thursday, the 7th instant,—J. Kibble, Esq., the President of the Society, in the chair.

A. Claudet, Esq., F.R.S., and R. Hunt, Esq., were unanimously elected honorary members of the Society, in consideration of their important services in advancing the science of photography. Mr. A. Robb was elected an ordinary member, after which the Society proceeded to the nomination of office-bearers for the next year.

Mr. Stuart showed some prints, produced by a photo-lithographic process, which he would not then disclose, but stated that it was different from any one yet published.

The Secretary then intimated that, as the paper on testing of old baths was likely to occupy the whole available time, Mr. James Cramb would not read his paper—*Notes on the Hyposulphites of Silver*—as announced in the circular.

Mr. John Cramb then read his paper, *On the Testing of Used Silver Baths, and the Hydrometer Silver Meter.* [See page 62.]

Mr. James Cramb performed the experiments described in the paper, with the hydrosulphate of ammonia, in testing for the presence of silver in the clear liquor from a bath from which all the silver had been precipitated. The test tube was handed to the Chairman and other members, who testified to the comparative absence of colour. The dense precipitate formed on the addition of the most minute amount of silver clearly proved the point at issue, and called forth the most marked demonstrations of approbation.

At the conclusion of the paper Mr. Cramb intimated that the experiments on which the results placed before them were based would then be gone through in their presence, or as many of the experiments as they chose to demand and time would permit.

Mr. Spencer suggested that Mr. Stuart's bath be re-tested.

The operation of testing that bath was then gone through, the whole being closely observed by the members of the Society, particularly those on the front benches. It was proved to contain eighty-four grains—the amount set down in the table on the wall.

Instead of trying another, Mr. Macnab suggested the trial of the same one a second time: it would be a severer test, and would, if all agreed, more conclusively establish the correctness of all the others in the table before them.

The second trial gave eighty-three grains to the ounce. A drachm was operated on each time. This result was considered satisfactory, with so strong a solution of nitrate of silver.

In a conversation on the variation of specific gravity by difference of temperature, Mr. Stuart said that the hydrometer would indicate a grain of silver of error for each degree of temperature above or below sixty degrees.

Mr. James Cramb distinctly denied the accuracy of Mr. Stuart's statement, and promised to prove its inaccuracy on a future occasion.

Mr. J. Spencer, Jun., said the hydrometer was useless as a test for old baths or solutions of silver, which contained other matter besides silver.

Mr. R. Leck said it was a cheat to sell an instrument to a photographer and call it a silver meter which would not measure the strength of an old bath, as he had no other use for it.

Mr. Stuart said the hydrometer was useless as a test for old baths.

Mr. M'Farlane: It is a mere toy.

Mr. Stuart continued: He used the hydrometer, and a plan similar to the one pointed out by Mr. Cramb, and he found he got the strength of his silver baths to within a grain or a half-grain.

Mr. John Cramb said Mr. Stuart's remark seemed to impugn the accuracy of the results he had placed before them; he therefore suggested that the bottles of solution be all sealed up and placed in the hands of the Chairman, and at another meeting let Mr. Stuart, or any one else, come forward and test the baths in their presence, when, he had no doubt, all his results would be confirmed.

Mr. Ewing said the thanks of the Society were due to Messrs. Cramb for the manner they had brought the subject before them; and he thought they would all agree with him in admiring the accuracy with which the experiments had been performed.

Mr. Stuart said Mr. Cramb had quite misunderstood him. He thought the results most satisfactory, and he begged to propose the cordial thanks of the Society to Mr. Cramb. He was glad the subject had fallen into such able hands, as he did not think any other member of the Society would have so successfully handled the subject as that gentleman had.

The Chairman remarked that he could not understand how any one could not at once see the uselessness of the hydrometer as applied to old baths; the method of testing proposed by Mr. Cramb was easy and reliable. He would bear witness to the accuracy with which the experiments had been performed.

It was then agreed to adjourn the meeting to that day week, to allow of further discussion and experiments. After the usual vote of thanks to the Chairman the meeting separated.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The first general meeting of the above Society was held on Friday evening, the 1st instant,—George Christopher Warren, Esq., Vice-President, in the chair.

Mr. J. F. McKie, the Hon. Secretary, read a detailed account of the establishment and laws of the Society, and announced the following gentlemen as elected to fill the various offices for the ensuing year:—

President—The Right Honourable T. E. Headlam, M.P.

Vice-Presidents—The Rev. J. C. Bruce, A.M., LL.D.; G. C. Warren, Esq.

Treasurer and Hon. Secretary—Joseph F. McKie, Esq.

Council.

P. M. Laws, Esq. | W. H. North, Esq.
R. Porteus, Esq. | R. S. Hill, Esq.
Robert Anderson, Esq.

The Chairman read a paper *On Photography As It Is*, of which the following is an abstract:—

This being the first paper read before the Society, he did not propose to bring before them any new process, but to give an account of the present state of the art, and show that photography was not confined to mere portraiture or depicting of landscape scenery. He stated that the art had reached such a degree of importance that no less than four Journals were now devoted solely to disseminating photographic information. Numerous societies existed, and were instrumental in improving the various processes of the art. These societies had obtained the patronage of men of rank and fortune, and at their meetings every subject connected with the art, comprising chemistry, optics, mechanics, &c., was fully discussed. The various modifications made in the several processes during the last few years were then referred to. In speaking of the improvements in the optical department, he specially alluded to the panoramic lens, whereby a picture was taken embracing a much larger angle of view than the ordinary view lens was capable of producing. Reference was then made to the various new printing processes for insuring permanency and stability, the present mode of printing with silver salts being, as alleged by the author, considered unsatisfactory. This part of the paper was

illustrated by specimens of various kinds of photographic carbon printing and engraving. Reference was then made to the application of photography to wood engraving, lithography, &c., and special notice was made of the patent process for obtaining photographs on glass and ceramic ware, and a specimen of that process was introduced. Amongst other applications mention was made of its use in astronomical observations, and for registering the variations of the thermometer, barometer, and magnetic needle. It was also useful to the architect, the engineer, the microscopist, and those engaged in military matters, &c. Photography was also being used in the Ordnance Office at Southampton for reducing the ordnance survey maps, whereby a saving to the country of £30,000 would be effected. Towards the conclusion of the paper reference was made to the influence of the art on the artistic taste of the public. In conclusion, he said if each member gave an occasional paper, or statement of either failures or successes in any branch of the art, or even put a few questions as to the why and wherefore of anything, he had no doubt they would always be able to pass a pleasant, instructive, and amusing evening.

Some fine photographs were then placed before the meeting by Messrs. Laws, North, and Warren.

Mr. Laws presented two views of the *Ruins of Tynemouth Priory* to the portfolio of the Society, for which a vote of thanks was passed to that gentleman.

The meeting was then adjourned to the first Friday in March.

BRADFORD PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Wednesday, the 6th instant, at the Rooms, Chapel Houses, James Street. Dr. R. Parkinson occupied the chair.

After the usual routine of business had been gone through, Mr. Rogerson, introduced to the meeting by the Secretary, was duly elected a member of the Society.

Mr. Fletcher said he would have pleasure in placing his photographic operating room at the disposal of the members.

A vote of thanks was given to Mr. Fletcher for his liberal offer.

Mr. Stanley proposed that one of Ross's instantaneous stereo. lenses be procured for the benefit of the Society; and Messrs. Parkinson, Stanley, Beldon, and Fletcher were appointed a committee to examine and report upon the same.

The thanks of the Society were awarded to the Secretary for a 10 × 8 Fothergill print, and to Mr. Beldon for two stereo. prints, by the same process, for the Society's portfolio; and also to several other members for presents of photographic works for the Society's library.

The paper promised by Mr. Stanley was, through a misunderstanding, not prepared, and was therefore postponed until the next meeting.

The remainder of the evening was pleasantly spent in discussion on numerous specimens by various processes brought for that purpose.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

The lights are now "impasted" with a good body of colour, and your most luminous and brilliant flesh-tints are in their places. To preserve these clean and bright must be your care as you proceed; so avoid teasing or muddling them. The next tints are those which delicately indicate the boundaries where the lights begin to melt faintly and imperceptibly into the demi-tints; and in mixing these use one touch of white and one of Venetian red, subdued slightly with a third of emerald green.* Over the tender tones of the photograph let this tint be applied in a somewhat more transparent condition, and with a rather full brush, the colour being in a nice soft pulpy condition, and free from dust or grit. That this tint may glide imperceptibly into those previously applied, with very light fairy-like touches, and with a soft-haired and not too-finely pointed brush (which might stab into and drag up the colour) work a little of the mixture of ochre, madder pink, and white into the last-mixed tint, where its edge touches that of those previously applied. If necessary the clean brush which serves as your "badger" may be swept with one or two slight feathery touches over this to aid in softening or blending the whole; but *be very careful not to sully the purity of the lights.*

Now, by the use of tints less and less luminous, secure roundness and gradation until the retiring surfaces approach the more broken or less pure tints, and begin to fall into gradations of shade and reflected light. For this purpose sets of tints have been already described; but by mixing even the few pigments given in varying proportions, such sets of tints may be increased and altered to a much larger number and variety. Their places, too, will be indicated more certainly by their appearance when thus mixed than by any directions I might endeavour to provide. In applying them, remember that one must be so slightly different from another, that it is only when placed in juxtaposition that the effect of gradation is perceived. It is much easier to use fewer tints; and the inexperienced lover of "pretty" colour will feel somewhat loath perhaps to take a subdued or broken tint, instead of those more charming ones which were mixed for the lighted and consequently brilliant portions of the flesh. But if he would avoid flatness and weakness, and secure roundness and life-like vigour, he must not shirk the painstaking labour of securing gradation.

Ruskin says:—"Give me some mud off a city crossing, some ochre out of a gravel pit, a little whitening, and some coal dust, and I will paint you a luminous picture, if you give me time to gradate my mud and subdue my dust. But though you had the red of the ruby, the blue of the gentian, snow for the light, and amber for the gold, you cannot paint a luminous picture if you keep the masses of these colours unbroken in purity, and unvarying in depth."

If you have read or practised all these lessons you ought to know the theory which governs these demi-tints—how they change in analogy of tone and colour, as well as in depth and intensity, &c.;* and here is the place to apply such practically. Thoughtful study alone can help you here. If you *consult your model and think*, you are all right; if you do not, I cannot, in these pages at any rate, lend you more assistance, or help you more effectually.

Having laid in these tints, preserving the forms of the high-lights, and gradating one tint into another to secure roundness, we next come to the shadow tints.

Now the great charm of a shadow is its transparency, and this can only be secured by gradation. Some authors and painters almost lead their pupils or readers to believe that this transparency means nothing more nor less than the mechanically-obtained transparency of the mere pigments themselves, which, of course, is a funny mistake. The shadowed passages have the same gradations as the lighted, only the tints are subdued and of a more uniform tone. Parts of the shadows will receive more or less light, either direct or reflected, and parts will be more deeply overshadowed; but detail and gradation will exist even in the deepest shades, although more or less distinctly, according to the amount or depth of obscurity. Few photographs have the delicate beauty in their shadows which we find in nature—a fact chiefly due to their producers neglecting the study of light and shade in connexion with the peculiar conditions of the photogenic process, as well as with those of artistic *chiaroscuro*. The successful operator must be both artist and photographer: if he be one and not the other he must fail to a proportionate extent. We now pass from the shadows (for which tints see page 19 of the present volume) into the reflections.

Reflected lights are peculiar to the shadowed surfaces merely because it is there only that they become visible. Their colour will be determined both by that of the surface which reflects them and that they are received upon. As a rule it is best to keep them of a rich warm tone. [See preceding remarks upon the same subject.]

Now we use our badger once again, feathering over the tints with it, and blending their edges, or bringing down any ridges of paint, but cautious always that the brilliant passages remain unsullied and no tints are rendered muddled or dirty.

Add a little drying oil to your medium; and with a little Indian red, brightened with a touch of vermilion, proceed to strengthen the nostrils, the lines separating the lips, the lower edge of the upper eye-lids, the darker markings of the ear, and the darkest cast shadows.

Put in the iris of the eye with dark blue, brown, or grey, according to the colour of the eye itself; touch in the reflected light within the iris, and opposite the spark of direct light, and lay in the pupil with black.

Touch in the lips with varying mixtures of vermilion and white, madder pink and vermilion, Indian red and lake—the last being used only for the upper lips, which will be in shadow, and must receive the same treatment as that you have given to other surfaces in shadow. Before painting the lips refer back to what I said of them in the articles upon touching in black and white;† for it is important that you should thoroughly understand what you are about—the "reason why" as well as the "method how."

Lay in the lights of the hair with a grey harmonising in tone and depth with its local colour. The hair must grow transparent towards the parting. Its reflected lights must be rather strong, its divisions not too deeply defined, or it will appear wiry. You must avoid anything like a hard line where the hair meets the brow

* By an oversight emerald green was omitted from the list given of necessary colours.

* See pages 154, 137, and 121.

† I am compelled to refer to past lessons very frequently, or the amount of repetition would render these articles sadly too long.

by softening the one into the other with the greys, the shadow tints, and the local colour of the hair. You must, in short, never lose sight of the real character and beauty of such a material. [See page 14 of the last volume, and maxim 45.]

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

A. H. B.—This correspondent rather puzzles me, his difficulties being such as I never before met with. I can only recommend him to use transparent colours, and be sure that his surface is not greasy. Some find their colours adhere to the albumenised surface all the better for mixture with a little albumen, but I never found it necessary. I think "A. H. B." must have been using opaque instead of transparent pigments. I have, it is true, sometimes met with albumenised paper which was very averse to the reception of colour, and this may be the case in his instance.

Foreign Correspondence.

Paris, February 11, 1861.

I WAS present on Thursday last at a series of very curious experiments made by Nadar, in his new operating-room, for the purpose of applying the electric light to photography. I found there a numerous party of men of letters, artists, and even practical photographers, all desirous of learning the results to be obtained from the alliance of the two great modern discoveries. The first essays were for obtaining negative portraits. The model—I had almost said victim, the operation was so long and tiring—sat at about two metres and a-half from the focus of light, and was placed so as to be lighted from above and a little to the right, while white screens around, and a large mirror on the shady side, sent back upon him the diffused rays. The light is very intense; the moments of intermittence are rare, and arise solely from the impurities of which they have not been able to entirely rid the charcoal. Three portraits were taken, the *pose* for the first lasting one minute and a-half, for the second eighty seconds, and for the third forty-five, which appears sufficient. The collodion employed is not peculiar. The developing is done, as usual, with pyrogallic acid. The object of the subsequent experiments was the obtaining of positives from the *cliché*. The printing apparatus had been composed as well as could be managed for the occasion, by placing opposite to each other a fixed camera and a telescope one, the space unavoidably left between them being covered with pieces of stuff. This extemporised apparatus was placed so that the negative was at about fifty centimetres from the lamp. At the other extremity were successively introduced several sensitised glasses, whose time of exposure was varied. Four seconds, with pyrogallic acid development, gave very satisfactory pictures. With a fine *cliché*, in which the contrasts between the lights and shades are not too violent, the exposure may be reduced to three seconds.

M. Serrin's lamp is of a very simple and ingenious construction. The charcoal points, though constantly being consumed, are always kept in contact; for they are supported by moveable branches, whose regulated movement exactly corresponds to the amount of light emitted. This little machine, which scarcely occupies more space than an ordinary lamp, is very portable. It can operate at a great distance from the electric battery, with which it is connected by two conducting wires. Thus, at Nadar's, the pile was separated from the lamp by an apartment and the operating-room. The powerful light employed for the above experiments was produced by a battery of fifty elements.

The process employed for the production of positive pictures is that of M. Albert Moitessier, which is as follows:—The negative is disposed so as to allow none but the transmitted light to reach the objective, as would be done for the reproduction of an engraving by transparence. It is evident that if, after focussing and taking all the usual precaution, a collodionised sensitive glass be placed in the frame of the camera, there must be obtained a positive picture, possessing all the qualities of a negative—that is, extreme delicacy and softness in the shades and half-tints. Positives of all sizes may be obtained by this method, though it is especially applicable to small ones.

For the preparation of the glasses a collodion somewhat rich in pyroxyline is made use of. The image is developed by means of a weak solution of pyrogallic acid, avoiding as much as possible the addition of nitrate of silver. The exposure ought to be tolerably long for the image to appear in all its details. In the solar light, according to the author himself, the time of exposure varies much, but is never less than twenty seconds, which would give a great advantage to the electric light. The image is fixed with hyposulphite of soda, or, still better, with cyanide of potassium. After the fixage the picture is very beautiful by transparence; and, if it is desired that it should remain in that state, washing and drying are all that is necessary. Viewed, on the other hand, by reflection, it is of a disagreeable grey tone. This inconvenience may be obviated easily in the following manner:—A solution of bichloride of mercury is poured upon the glass. The image first becomes black, then white: when it has acquired a very uniform tint, a weak solution of ammonia or of hypo. is poured upon it. The tone then becomes very vigorous, but pales a little in drying. There must then be applied upon the collodion a layer of white, which is to form the ground of the picture. For this, the white is diluted in a mixture of copal varnish and benzole; then spread over the glass, just as a layer of collodion. Being very even, it dries rapidly. The picture may be kept in this state, and produces a good effect; but it is preferable to transfer to paper, which is easily done by fixing a sheet of white paper upon the colour, and then letting dry: the whole may then be taken off without difficulty. The image has a good deal of brilliancy, and looks as if it were covered with a layer of gelatine, if a well-polished glass has been operated on. We saw this transfer made very rapidly at Nadar's, notwithstanding the unfavourable conditions.

Now, if it is asked what would be the advantages of the practical application of the electric light to photography, aside of the interest presented, from a scientific point of view, by the study of the phenomena resulting from such application, we shall be led to the following conclusions:—The light with which Nadar operated the other evening costs him fifty francs each time, whereas the light of the sun, in all its abundance and fecundity, is offered gratuitously to all who will turn it to account. Further, the results obtained in this manner, as far as negatives are concerned, can never be equal to those produced by the solar light. Still, there are many cases in which the electric light would be a valuable resource: for instance, when dark interiors or tombs in cathedral vaults have to be reproduced, or when one is called on to take portraits after death, in rooms into which but a feeble daylight penetrates. Its most important use would be for the printing of positives, especially if a means of sensitising gelatine were discovered, so as to permit of the employment of one of the carbon processes. There would be economy of time, as the night would become available; and, at the same time, the certainty of strength in the pictures. Lastly, this means would be applicable to magnifying apparatus, the principal inconvenience of which is the impossibility of using it without the direct light of the sun. With the electric lamp we should be independent of the collaboration of the capricious luminary, and should be able to operate at any hour and in any weather. This also is the object aimed at by Count Aguado in the experiments he is following at present. I have not yet seen anything obtained by the noble amateur; but I know that he is studying the subject, and should there be any results I will inform you.

ERNEST LACAN.

WE have been favoured with the following interesting letter, received lately by a photographic friend:—

The Far South, October 2nd, 1860.

MY DEAR * * *

Yours of July 25th has been duly received, and herewith accept my thanks for same. I had recognised my letter in THE BRITISH JOURNAL OF PHOTOGRAPHY before yours came to hand. I must try to send you something more to be used in the same way. By this time you will have received some specimens of my work, which, to tell you the truth, I thought "no small beer" of, till I saw those of Mudd's and Bedford's that you sent out. I was very much pleased with them, but felt quite downhearted at having the pride taken out of me. However, I saw where my productions were deficient, and I hope ere long to send you some pictures that may be hung on the same line. * * *'s already quite equals, and in some little views taken lately I think even excels, them: however, you can judge for yourself. I am about to return to you the lens * * * sent me, by next box; if not too much trouble, I shall be much obliged to you if, on your next trip to London, you take it with you, and get him to change it for a landscape lens, if he will—a lens to cover a seven by nine plate, taking in a large angle, and sharp to the edges. I do not want a lens that will cover a larger plate than seven by nine—that I can get here, as your brother has plenty; but one that will really work on this size, with a small allowance for cutttng off foregrounds, &c.

The *diez y ocho* has been a merry one, at least as I understand. I was away in the country on a photographic trip. I sometime ago promised Mr. * * * that I would go out for him to take some views along the railway: so on the 17th I started in company with the draughtsman of the Company for Quillota, with every requisite for working the wet process. On the road we met one of the assistant engineers, who having nothing to do accompanied us. As soon as we got to Quillota, I felt that the heat was so great that in all probability the collodion I had with me would not work, so I sent in word by the next train

for a bottle of alcoholic collodion to be prepared: of this more anon. After lunching we prepared to start for the Tabon, about twelve leagues from Quillota, the most difficult piece of the line, and about which they are still in doubt as to whether the line is to be carried through it or not. We met one of the Lathams, going to Llai Llai, and he kindly lent a horse to the young man we had met on the road. We did not reach the Tabon that night, as the darkness overtook us; and, as none of us knew the road, we made friends with a *ranchero*, and passed the night in his hut, accompanied by millions of fleas. We looked like leopards when we got up next morning. Before sunrise we were on the road again, and reached our journey's end about nine o'clock. The engineers' encampment is at the entrance to the pass: it is almost impossible to get beyond this point on horseback. Immediately after breakfast I began reconnoitering, but found it a very difficult matter to select points of view. The scenery is on so grand a scale, that to get it all in, in a way to give an idea of the place, it is necessary to get a mile or two away. I next started for the interior of the pass, and took my traps with me. As soon as we had passed the first rocks, I felt that if the heat was against success outside the pass, it was ten times more so inside. I determined, however, to make a trial; and, after much trouble, managed to set up my tent and camera at a spot that was not quite at an angle of 45°, like the rest of the hill. There was not a bush or a stone to afford the slightest shelter, and the sun was burning like a furnace. I stripped to my shirt and trousers, and set to work. Although I poured the collodion on the first plate as fast as I could, it was set before I could tilt it up; so I cleaned another, and managed to cover it by half emptying one of my collodion bottles on to it. I got it into the bath, but, on taking it out, a large fly of a (to me) new species chose it as his resting-place. So at it again: this time I got the plate into the bath, from there to the camera and exposed, and back into the tent; but misfortune again pursued me. Just as I was about pouring on the developer, several large drops of perspiration from my face fell on to it, and, as a matter of course, did for it. At length, at the fifth trial, I got a picture, but a very unsatisfactory one. I had had enough roasting for one day, so I packed up my traps and went down. In the afternoon I got another plate of the entrance to the pass—by no means good. It was covered with blisters of a description I had never seen before. I think the solution must have run into drops in the camera, as the print will show you. I now made up my mind to send our *mozo* back to Quillota for the collodion I had ordered; but, considering the hard work he had had inside the pass, I decided not to send him, and thinned the collodion I had with some of the alcohol I had taken for cleaning plates.

The next day was foggy until one o'clock, but I managed to get a very nice near view of the encampment. About midday it cleared up; so I went off to the pass again, the heat not being so great. I this time succeeded in getting a fair negative, although the distance was hidden by the fog; but the effect is not bad.

I could well have passed three or four days here, as there are lots of fine and extraordinary views to be made; but I saw that it would be better to look on this trip as a trial. Consequently, having satisfied myself as to what I ought to do next time, we prepared to return. On our way back we stopped at the Centinela Tunnel works, of which I got two good pictures. I also took a picture of the *majordomo*, his wife, and family. It would be useless to try to describe the antics of the man when he saw his portrait: he was taking it up and running out to the light with it every moment, till at last he managed to pass his sleeve over one-half of it, and then he left it alone, but did not cease to lament the accident the whole evening. *Hacendado*, who was on a visit, sent my companion to me to say that, if I would take his and his family's portraits, he would willingly pay anything I liked to ask. Of course I told him that payment was unnecessary, and satisfied his vanity by placing him, with his "better half" and three youngsters, in the foreground of one view. The lady had put on several diamond rings and bracelets for the occasion, but unfortunately none of them are to be seen.

On passing Llai Llai we called for Latham, but did not find him: his brother, however, made us dismount to lunch. Here I found that the horse we had borrowed belonged to a friend of mine, who had left word that I was quite welcome to him if I would send him some copies of the views I had taken. On arrival at Quillota we found the *fiestas* going on in grand style, and managed to amuse ourselves pretty well, considering that our rigging was rather dilapidated. I also found a parcel containing the collodion I had sent for. But, Oh horror! on opening it, I found that, instead of taking a bottle of collodion from my room, as I had requested, they had taken a bottle of albumen, to which the chemist had, as directed, added alcohol! and the consequence was that the whole composition bore a strong resemblance to Devonshire cream. I thanked my stars I had not sent the boy on an eighty miles ride for it. In all, I got five or six passable pictures, of which you shall have proofs. Although I was not so successful as I had hoped to be, yet the experience gained will enable me to go out another time with certainty of success.

I had intended going into some photographic talk, but I find my paper is nearly filled; so I will not say more for the present than that I am satisfied that in a trip like this dry plates ought to be taken, as it is quite out of the question to think of working wet in such heat and in such uneven ground. I have tried the collodio-albumen, of which you will have received a specimen; but it is very troublesome, and I cannot get over the nasty deposit, in spite of all my washing and scrubbing. I am now going to try the Fothergill, which I expect will answer. Some dry process I must have. * * * has made several trials of various kinds, but has hit on nothing really satisfactory as yet. However, more of this next time. For the present, I remain, yours truly,

C. L. R.

PHOTOGRAPHIC DISSOLVING VIEWS.—The Directors of the Pendleton Mechanics' Institution have been raising funds by the nightly exhibition, in the Lecture Hall, of dissolving views, the pictures for which have been produced by photographic agency. Two of the directors, Messrs. Rangley and Atherton, furnished transparent photographs of their own production, the subjects being of local interest, including the Broadbottom Viaduct, St. Thomas's Church, and picturesque views from Wharfdale and its neighbourhood. Other photographic views were also exhibited of Paris, Palermo, the Bay of Naples, the lava formed on the summit of Vesuvius, the rice-fields and characteristic vegetation of Java, and the Falls of Niagara; together with portraits of Garibaldi, and other notabilities. Some very fine reproductions of celebrated statuary were also exhibited. This exhibition, which has excited great interest, not only on account of its educational value, but also for the good object that has called it into existence, has been patronised by the Mayor and many members of the Town Council of Salford, and in every way has proved a success.

Correspondence.

DEGRADATION OF TONE IN ALABASTRINE POSITIVES.

To the EDITOR.

SIR,—The little notice taken of the alabastrine process by the various periodicals of the day leads me to infer that it is a branch of our art not much practised by photographers generally; nevertheless, hoping there may be still a few among the numerous readers of your very useful Journal who may have devoted some portion of their time to working in that direction, I would venture the following query, the solution of which would be of much service to myself—perhaps to a few others also, similarly circumstanced.

On washing the mercurial solution (redeveloping solution) from off the whitened proof, I have been annoyed with a discoloration taking place, more or less in proportion to the time it is allowed to remain in the water or under the water-tap—hot water hastening the browning very considerably—so that in order to preserve the original whiteness, as when fresh from the redeveloping solution, I am compelled to content myself with a more scanty ablution than, I fear, is compatible with the entire removal of the bichloride of mercury, and thereby endangering the permanency of the picture.

On a little reflection it occurred to my mind that its loss of purity—the tone of the picture being lowered several degrees—might be caused by the carbonate of lime, contained in the town-supply water, uniting chemically with the calomel formed on the whitened proof; but I was somewhat surprised at finding the same annoyance to occur, apparently to the same extent, after the use of rain water from a cistern hard by, which could not contain lime in solution.

The picture being thus rendered useless as a glass positive—in fact, presenting the appearance of a tolerable negative—I was naturally induced to try the effect of a second flooding with bichloride solution, which in a few minutes restored all its pristine beauty, unfortunately to be again lost if exposed to the same and, if possible, necessary amount of washing as before.

The alabastrine proof, from its purity of tone and suitable surface for taking the ordinary powder colours, is a great favourite with myself; and, from the almost universal silence on the subject, I am obliged to think that I have but a few companions in the choice of a process which, when well worked out, leaves but little to be desired in the glass positive, the permanency of which I am also enabled to verify by proofs of several years standing.

Trusting that yourself or some kind friend may be enabled to keep me out of the above-described difficulty, by explaining its cause and suggesting a remedy for the same,—I am, yours, &c., HENRY H. HELE.

P.S.—May the browning after the *rain water* be caused by the minute portion of ammonia that there might be in it? But, whatever be the cause of the discoloration, it little matters, the remedy being the chief thing wanted. It would be quite impossible in the country to get a sufficient quantity of *distilled* water for washing purposes. H. H. H.

Teignmouth, February 4th, 1861.

[It occurred to us as just possible that the degradation of tone noticed might arise from darkening of the small quantity of chloride of silver produced by decomposition of the bichloride of mercury, the operation being performed in ordinary daylight; if so, that it might be worth trying whether prolonged washing in the dark room were equally detrimental; but, on reflection, it is scarcely probable that any darkening of chloride of silver would occur in presence of an excess of chloride of mercury. The effect complained of is probably due to the presence of some alkali in the water used, and, therefore, boiling it might be useful. Perhaps those more conversant with the process may favour our correspondent with their experience.—ED.]

RESIN PROCESS.

To the EDITOR.

SIR,—It is now some time since I had the pleasure of addressing you, and you will recollect the subject was the "resin process." I now beg to hand you a few results, which have been forwarded, per rail, to-day.

I have noticed from time to time your objections, and have done my utmost to prove their validity; and I have come to the conclusion that for the whole of them there is a remedy. The greatest of all obstacles to overcome was the tendency to insensitive spots, which you will notice in some of the specimens; but I can confidently assert that, if sufficient care be taken, these may be got rid of by using the minimum quantity of resin in the collodion, and protecting from dust while moist. Some of the

plates were kept fourteen days; beyond this I think it is not safe to use them.

I am a great admirer of the Fothergill process, and have taken a great deal of trouble to trace causes of failure to their sources, for which you were pleased to give me some commendation; but I never was able to work larger than stereoscopic size with anything like certainty. But with the resin there is no limit, and I find it to be much more sensitive. This last quality is a very great consideration—so much so, with me, that if I could bring myself to become a *second-hand* photographer, I would use no other plates but Dr. Norris's improved ones, until I could produce a plate myself of equal sensitiveness. Enclosed is a list of the subjects, viz.:—

1. *Conway Castle.*—Blowing very hard; exposure 2¾ minutes, 13 inches focus, ⅜ stop, diameter of lens 2¼ inches. A slow lens from its colour. October 10th, 1860. Rather too deeply printed.

2. *Birkenhead Priory.*—Same lens, &c.; exposure 20 minutes; time ½-past 7 morning. End of September, 1860.

3. *Avenue, Birkenhead Park.*—No record.

4. *Menai Bridge.*—October 11th, 1860. Time ½-past 4 p.m.; exposure 3½ minutes.

Stereograph.—5. *Conway Castle.*—Ross's lenses, 4½ focus; exposure 15 seconds; taken at same time as No. 1.

6. *Avenue, Birkenhead Park.*—Exposure 5 minutes in early morning.

The *Birkenhead Priory* is almost completely covered in by the trees; there are, besides, a variety of causes why one should give a long exposure. With the best possible light and wet collodion in landscape order, with the same lens, I should have given three minutes. I find my exposure with resin plates to be about twice the average of wet collodion, and one half the exposure of "Fothergill." I never use iron developers. I feel certain that the process only wants to be better known to make it a favourite.—I am, yours, &c., JOHN GLOVER.

Liverpool, January 30th, 1861.

RECOVERING SILVER.

To the EDITOR.

SIR,—Will you kindly oblige me with your advice on the following:—

I have a porcelain dish, which I formerly used for sensitising paper, and which, in consequence of cracks in the glaze, has become impregnated with silver. Is it possible to recover the silver?

I thought of breaking it up into small pieces, putting them into the crucible, and treating them in the same way as spoiled prints, old filter papers, &c.

If you will please say whether this is likely to be successful, I shall esteem it a favour.—I am, yours, &c., A SUBSCRIBER.

Birmingham, Feb. 6, 1861.

[We advise you to break up the dish into small pieces, and suspend them in a muslin bag near the surface of a dish of distilled water; the solution of nitrate of silver will then sink down to the bottom of the vessel, and may be collected and precipitated by chloride of sodium.—ED.]

PREPARATION OF METAGELATINE.

To the EDITOR.

SIR,—Will you please to give the best method for making metagelatine? I have sought through many back numbers, but have not been able to find a recipe.—I am, yours, &c., F. B. E.

[Dissolve an ounce of gelatine in twenty ounces of water, and boil in a covered saucepan, with a quarter of an ounce of oxalic acid, for one hour. Next add powdered chalk until effervescence ceases, and strain through calico; after which the liquid may be clarified, by adding to it the whites of three eggs (previously mixed with their own bulk of water), and heating once more to the boiling point, so as to coagulate the albumen and entangle the suspended oxalate of lime. Mix the filtered solution with a sixth part of alcohol. Use it of the strength of twenty grains to the ounce of water.—ED.]

PHOTOGRAPHS IN NATURAL COLOURS.

To the EDITOR.

SIR,—The wonders of photography seem never to cease, and I think it right that every improvement should be made known and circulated as widely as possible.

For my own part, I take a deep interest in watching the rise and progress of each invention in this most interesting art; and on reading an account of photographs taken in America in their natural colours, I referred to one before me, taken twelve months ago, by a clever artist, whose name and address I do not hesitate to make known: it is "Joel Findlow, Mill Street, Congleton."

The subject is a boy, who, I understand, is nephew to the artist.

The exact colours of the handkerchief round the neck, in which are intermingled red, white, green, and brown, are portrayed more perfectly by the solar rays than the ablest artist could effect.

If Mr. Findlow could be prevailed upon to communicate the secret how it is that he has been able to do this it would, I consider, be quite a *desideratum* to the photographic world.—I am, yours &c.,

Congleton, 24th January, 1861. AN AMATEUR.

[We insert the preceding because it has been attested by one who would scorn to attempt a hoax; but we have *not the slightest* faith in the supposed facts, and believe our correspondent himself to be the victim of either deception or misunderstanding.—ED.]

HOW TO CONQUER A STUBBORN VIEW.

To the EDITOR.

SIR,—I shall be glad to be favoured with replies to the following questions:—

QUESTION 1.—I have been trying to take a view, by the direct positive process, on glass. It is a view (from an upper window) of Norwich Cathedral—distance about 250 yards; the most distant and best lighted part (the spire) is always dim, dull, and almost foggy. I have made several alterations in my bath, but it is always the same. Are there any particular hints you can give me bearing upon taking such a view as I have described above by this process?

QUESTION 2.—What *degree* of acidity should characterise a positive bath? Should it turn blue litmus paper pink in eight seconds—or even in *three?*

QUESTION 3.—If I want to dissolve *one* ounce of pure metallic silver, what should be the relative proportion of *water* and of *nitric acid* in the solution in which I put the silver?—I am, yours, &c., NORWICH.

[1. *Incline the diaphragm* in the tube of your lens, so that the *upper* part leans towards the view to be taken: this will give a larger effective aperture for the foreground than for the sky of your subject, and thus the requisite exposure for each part will be more nearly equal than at present.—2. Your bath should be fully as acid (with nitric acid) as you indicate, or even slightly more so. See that your collodion is slightly yellow with free iodine.—3. Not very material, but about three parts to one will do.—ED.]

ANSWERS TO CORRESPONDENTS.

J. STEVENSON.—Declined with thanks.

GEORGE WILSON.—Received with thanks. In due course.

COMO.—Scarcely suitable: but we thank you all the same.

J. H. STACY.—*Journal of Pharmaceutical Society*, Vol. VI., page 526.

F. M.—You are right in your conjecture: the ether is the stumbling-block.

FAILURE.—Never mind; try again. Your formulæ are quite correct. Give longer exposure.

BOTHERED.—You have added too much acetic acid: make an equal quantity without any, and add both together.

C. D. R.—If you are not acquainted with any of the members write to the Secretary, Dr. Diamond, and he will, no doubt, introduce you.

T. R.—We think you would do well to select some other shop, after the treatment which you describe. We, however, know nothing about the party named: we have never met with the name before.

F. R. S.—We have noticed the errors of the writer mentioned; but we find that very few put faith in his assertions, or, to put it more correctly, in his judgment, so that the matter is really but of small importance.

ROBERT KEYSOR.—You will find a very good formula in our *Almanack* for the present year. Use the iron developer first, and intensify if needful. We have too many inquiries to allow of the possibility of private replies.

AN ILLEGIBLE HIEROGLYPHIC (Croydon).—1. You had better use a glass of deep orange yellow colour, and cover it also inside with yellow calico, one layer of which is sufficient. 2.—Amber steeped in pure chloroform to saturation.—3. About the last week in March.

HENRY MORTON.—Your communication would not be of any interest to our readers, who are well acquainted with the ordinary capabilities and applications of our art. It is rather suited to an audience of non-photographers. Still, for your kind intention accept our thanks.

J. W. (Washington, U.S.)—The publisher has received the remittance, and has attended to the other matter mentioned in our correspondent's communication. It was refreshing in these days of commotion to receive a transatlantic letter addressed to "Liverpool, Old England!"

A BEGINNER.—The earlier part of your note has been already answered by our Publisher. You do not mention what developer you use, but in all probability it is a salt of iron: if so, the film you mention most likely arises from your keeping the developer too long on the film; you should wash it off before the details in the shadow are quite out.

A BEGINNER.—You err in supposing that there is any peculiarity of process for taking "instantaneous" pictures beyond what has been published in most manuals. The operation depends upon favourable circumstances of light and purity of chemicals nicely adjusted to each other, combined with delicate and intelligent manipulative skill. We know of no work that can assist you so well as Hardwich's *Manual*.

C. J. D.—No. 1 a little (but not much) under-exposed; the lens appears to be good. No. 2 is yellow, because you have not sufficiently washed away the free nitrate of silver before immersing it in your toning bath; or, you have neglected to wash it after the toning bath, before immersion in the hyposulphite of soda—remedy obvious. We may as well caut on you also against toning in strong ordinary light, which acts injuriously during that operation.

STEREO.—If we thought you were serious in your remarks about Knole, we would leave you to the demon of ill-nature without mercy.

The first name on your list is by far the best, and then No. 6.

All single lenses, with a stop in front, produce barrel-shaped marginal lines; but for stereoscopic landscape subjects, this is not very important, and those lenses made by a skilful workman have the defect reduced to a minimum.

W. DANIELS.—All five of the names in your list are good makers of collodion; but perhaps you will work at first most readily with No 1. especially when it has been iodised a few days. I you are familiar with the positive process you ought to succeed readily; give double your usual exposure at least, develop with pyrogallic and acetic acids, and push the development until the plate appears to you much over-done. Fix with hyposulphite of soda, and you will not want any intensifying. Get a little manual by Hennah, published by Knight and Sons, Foster Lane, Cheapside, London.

J. Q. A. T. (Zanesvill, Ohio, U.S.)—We have nothing whatever to do with the *business* of the Journal, and have therefore handed your draft for 12s. to the Publisher, and forwarded the several letters enclosed as addressed. With regard to your questions, we believe—1. That the composition burnt in Moule's photogen is the ordinary signal light, made of nitre, sulphur, and fine sawdust, with sometimes zinc filings added.—2. A pistolgraph is intended for taking pictures, suitable for lockets, brooches, &c., about one and a-half by one inch in dimensions.—3. The kind of lens that *requires no focussing* is a myth. The nearest approach to it is that used in the pistolgraph.—4. Of the list you give, select that of the *shortest name.*

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 137, Vol. VIII.—MARCH 1, 1861.

Solar Camera.—In our leading article of the 15th January we found it requisite to comment on a paragraph contained in the communication of our esteemed correspondent in Paris, M. Ernest Lacan, bearing date 28th December, 1860 [see p. 24 of the current volume], regretting that the demonstration of M. Foucault, which he regarded as so satisfactory, had not been repeated. When about "going to press" with our last we received our copy of the official organ of the French Photographic Society, in which, to our satisfaction, we found the report of the December meeting to which M. Lacan had made allusion, and have been not a little amused at the mystification and confusion to which the introduction of the solar camera has given rise—our worthy correspondent himself not having escaped being involved in the "fog." In order to render our observations intelligible, it will be necessary to quote from the letter the paragraph before commented upon, which is as follows, viz.:—"M. Foucault proved with mathematical clearness that all the objections turned upon a misunderstanding, and that M. Claudet alone was in the right. His demonstration was not lengthy, but it was presented with an authority and a precision that were unanswerable: M. Bertsch himself was forced to acknowledge it The figure traced upon the black-board, by the learned photographer of the Paris Observatory, sufficed to show both the excellence of the principle of Woodward's camera and the correctness of M. Claudet's reasoning. The image formed at the centre of the objective—that is to say at the apex of the cone—is certainly that of the sun, upon which the image of the interposed *cliché* becomes depicted; for the *cliché*, being transparent, does not interrupt the convergent direction of the rays. The two images exist really but at the apex of the cone—that is to say at the centre of the objective—all the other parts of which, receiving extremely feeble rays, form but the diaphragm. There is then a maximum light, and freedom from the aberrations of sphericity. This conclusion is identical with M. Claudet's." The *misunderstanding* to which allusion was made we have, at some trouble, "unearthed," and find that it emanated entirely from the same worthy old lady of the male sex who, not very long back, vouched for the value of that brilliant discovery, the *encre photographique*, which has since proved to be a shameless adulteration of nitrate of silver with nitrate of potash; and we may remark, *en passant*, that our refusal to recognise the authoritative judgment of the said "old lady" as of any value threw the then editor of a contemporary almost into a fit.

At the last meeting of the British Association a paper of a laudatory character on the Solar Camera was read by M. Claudet; and when publishing a report of the same we remarked that, had we not had ocular demonstration to the contrary, we should have doubted whether the author had ever seen a microscope, because he attributed to the solar camera as a novelty that which had been long in use and understood with regard to the microscope. The substance of the same paper was, it appears, subsequently communicated to the French Photographic Society by the author, and at the time gave rise to controversy and complete refutation of the supposed excellence of principle by M. Bertsch: it was opposed also by M. Thouret and others. With all these facts our readers were rendered *au courant* at the time. It appears, however, that the editor of a French contemporary, in his zeal to support M. Claudet, not only attributed to him as a grand discovery an absurdity existing only in the said editor's imagination, but was indiscreet enough to publish it, alleging that M. Claudet asserted the existence of a minute image of the *negative* in the centre of the amplifying lens. We need scarcely say that M. Claudet made no such ridiculous assertion, the blunder being on the part of the editor in confusing the image of the *sun* with that of the *negative*. It was against this blunder to which M. Thouret addressed his remarks, and which M. Léon Foucault explained; but, so far was he from proving, or even asserting, "that M. Claudet alone was in the right," as implied by our correspondent, we find M. Foucault made these remarks which we quote, viz.:—"Shall it be said that, in order to obtain the best results, it is indispensable to receive the focus of the condenser on the amplifying lens? That is quite another question!" And "It would be *preferable*, in my opinion, to cause the solar image to fall *beyond* the amplifying lens." While M. Bertsch, instead of acknowledging M. Claudet's victory as erroneously asserted, reiterated and referred to his former objection, of the necessary absence of sharpness of the image due to the faulty construction of the solar camera.

Before concluding this subject we cannot forbear remarking that it is an odd thing, when so much explanation was being made, that M. Foucault himself should have been allowed to fall into misapprehension on one point without being corrected. From several diagrams which are included in the report of the meeting, we perceive that the amplifying lens is represented as a *single combination*—a circumstance that we should have attributed to simplification for convenience, only for the fact that we find M. Foucault concluded his remarks thus:—"It would be preferable, in my opinion, to cause the solar image to fall beyond the amplifying lens, giving the latter the meniscus form, the concavity of which should be turned towards the solar focus. We should then have a system acting in a converse manner to that of the old camera obscura of Wollaston adopted by Daguerre. This arrangement, founded on the employment of a single combination, ought already to give very good results; but further resources might still be found in the employment of *double combinations*."

Was there nobody present acquainted with the fact that Woodward's camera was originally designed for use with a portrait lens?

Photo-Lithography.—We have been favoured by Mr. Stuart, of Glasgow, with two specimens of the photographs exhibited by him at the meeting of the City of Glasgow and West of Scotland Photographic Society, held on the 7th ultimo. They are both copies of engravings; but, so far as we can judge without access to the originals, we should pronounce them to be of very unequal merit. In that of the illustration of a statuette some of the more delicate lines are run into one another so as to pro-

duce a "smudgy" effect, and the outlines of the hair especially are heavy and coarse; but we are of opinion that in attempting this subject Mr. Stuart was rather too ambitious, and it may probably turn out that when further progress has been made in the manipulation of the process, which is alleged to differ from any yet published, this existing weakness may be overcome, for in the other subject, a copy of an antique vase, where the lines are all bolder, the reproduction appears to be complete, sharp, and clean.

PHOTOGRAPHIC PAPER.—The discussion upon Mr. Hughes's paper read at the last meeting of the Photographic Society (London) was fruitful in suggestive matter, and is we believe to be followed up in continuation at the next meeting. It is also satisfactory, in a point of vast importance to the photographic world, inasmuch as we have now considerable hope that the long-existing want of a thoroughly good paper upon which to print photographs may at no distant day become readily attainable. Mr. Henry Bohn, the well-known publisher, whose vast experience with all kinds of paper has rendered him familiar with the various qualities produced by the most noted manufacturers, expressed some astonishment at finding photographers in any difficulty about the matter, and asserted that what was described as a desirable kind of material for their use appeared to him precisely similar to that requisite for the reception of impressions of the highest class of wood engravings, and handed round a copy of a work on the History of Wood Engraving, very recently issued by him, containing a large number of illustrations. So far as we could judge from mere inspection the paper used in the work above-named appeared to us to be admirably suited to the requirements of our photographic brethren. Mr. Bohn stated that he knew of three firms, manufacturers of paper, all of them likely to produce a first-class material if desired, but did not mention the names. Having made diligent inquiry relative to the paper upon which Mr. Bohn's book was printed, we find that it was that known as "DICKENSON'S WHITE TICKET"—a designation which we recommend our readers to bear in mind; and not to forget also another hint of Mr. Bohn's, viz., to use *vellum size*, and if needful size the paper for themselves. *Verb sap.*

MORE NEW LENSES.—In another column will be found an extract from the report of a meeting of the American Photographical Society, at which some description is given of a lens about to be introduced by a celebrated American optician, Mr. C. C. Harrison. As we have no doubt that the pages of a contemporary will contain a reprint of the report, and that therefore we shall probably have inquiries relative to a matter that is sure to excite considerable interest, we deem it advisable to make a few comments upon the subject at once. We may remark, *en passant*, that the Mr. Harrison alluded to is not the same gentleman as the one mentioned in another part of our impression as taking part in the proceedings of the French Photographic Society. We perceive that the American Society has very prudently abstained from expressing any opinion upon the merits of the lenses until after they have been submitted to examination by a sub-committee appointed for the purpose. We rejoice at this, because we are convinced that either Mr. Rutherford or the reporter must have been under some misapprehension regarding them.

It is asserted, with reference to these lenses, that the field is flat, and that an angle of picture extending to 90° is included. Indeed, this would follow as a matter of course, if there were no error in the statement that a lens of twelve inches focus covers a field of twenty-four inches. But we have no doubt whatever that there is very considerable error in the alleged *focus* of the lens, the distance having been probably measured from the nearest part of the lens to the plate, instead of the *equivalent focus* having been quoted—a difference which would most likely reduce the calculated angle from 90° to 60°, or even less.

There is also some confusion of ideas expressed about *angular aperture*, which is evidently put for *angle of field*—a very different affair: in fact, as a rule, the larger the *angle of aperture*, the smaller is the *angle of field* that the lens will properly cover. The next point to which we wish to advert is a little amusing. It is claimed that these lenses give a *more perfect* rendering of straight lines than any other lens. Now, as an ordinary portrait lens, with a diaphragm properly located, will render straight lines absolutely rectilinearly, to say nothing of other combinations already in use, how is it possible that they can be rendered *more perfectly?* Truly M. Petzval did not claim so much for his orthoscopic lens, and he showed his prudence thereby. In the remarks that we have felt it necessary to make we have no intention of depreciating the alleged new lenses. They may be good—nay, even improvements on existing forms—for aught we know at present; but we are quite satisfied that the statements to which we have adverted are not capable of being sustained. We shall be on the look-out for the report of the sub-committee with some interest.

NEW PHOTOGRAPHIC SOCIETY.—It will be seen by our reports of the meetings of societies that the contemplated new society in the northern metropolis was inaugurated on the 20th ult., under the name of the "Edinburgh Photographic Society."

PHOTOGRAPHIC COMMENTS.

By T. F. HARDWICH.

No. XIX.

SEVERAL letters having been published with reference to the triplet lens recently brought out by Mr. Dallmeyer, we determined, in the interests of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, to examine the instrument, and ascertain what it was capable of effecting. There exists an impression, not altogether destitute of foundation, that in improving a lens in one particular it is generally injured in another, and hence we were anxious to inquire what had been lost in order to secure the freedom from distortion so important in a good copying lens.

The lens supplied to us by Mr. Dallmeyer had an equivalent focus of thirty-five inches, and was said to cover a plate of twenty-two inches by twenty. We desired him to put the instrument into the best condition for copying maps, which he did by grinding the central negative lens of greater power, and thus adding to the flatness of field. As a standard of comparison we took an orthographic of T. Ross's, likewise constructed for plates of twenty-two inches by twenty, and having an equivalent focus of 37·5 inches nearly.

To commence with a sketch of the mode in which the experiments were conducted:—A number of visiting cards, printed from the same copper-plate, were arranged in a horizontal line upon a black board, and the back of the camera having been partially closed above and below, and left open in the middle, a stereoscopic frame was made to slide across, so that the focussing glass could be brought to bear either upon the central or upon the marginal portions of the field. If, instead of stereoscopic plates, glasses of twenty-two inches by twenty had been coated, there would have been a much greater chance of the sensibility of the collodion varying, in consequence of evaporation and drying up of the film. The employment of a glass of the stereoscopic shape had also this advantage—that two pictures of the same part of the image could be taken side by side, by shifting the plate, and the exposures could be varied when necessary.

In testing lenses of a long focus the duration of the exposure is so great that it interferes much with comparative experiments. To obviate this difficulty the most sensitive bromo-iodised collodion was developed with a strong solution of sulphate of iron, and thus the times were reduced to about sixty seconds with the stops of 1·2 inch aperture, and two minutes with the ·85 inch aperture. By *halving* the exposure in each case for the first of the two similar pictures taken side by side, the rapidity of the lens was easily determined, since, in photographing a black and white object, under-exposure always results in a very prolonged and feeble development, the negative appearing weak and grey when viewed by transmission. These particulars are given lest it should be objected that the experiments were inconclusive because the lenses were not worked simultaneously upon one camera. Doubtless the latter method of proceeding is, as a general rule, preferable, but it

would not have been easy to apply it to the apparatus before described; and since we were fortunate enough to secure two days in which the light appeared to be uniform (the first of the two days being cloudless, and the other altogether cloudy), we have no doubt whatever that our conclusions are strictly correct, and that by going over the same ground several times, backwards and forwards, we arrived at length at the true state of the case as regards the rapidity of working of the triplet lens.

Mr. Dallmeyer considers that his lens is theoretically "quicker acting" than the orthographic lens, and gives his reasons in a letter which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY of February 1st. We do not find, however, that his views are borne out by experiment; for on careful comparison with stops of varying size it appeared that the orthographic of 37·5 inches focus worked in exactly the same time as the triplet of 35· inches when the picture was taken by the centre of the lens, whilst in the case of similar pictures taken with the marginal portions of the lens, or with the "oblique pencils," as the opticians say, there was an advantage on the side of the orthographic to the extent of about one-fifth of the whole exposure. With reference to the actinic power of the central rays corresponding exactly in the two lenses we entertain no doubt at all, since the experiments made on the first and sunny day agreed with those performed on the second or cloudy day. That the outside portions of the field were less brilliantly illuminated in the case of the triplet than in that of the orthographic we can not affirm with the same confidence, although the results of three consecutive sets of experiments appeared to indicate as much.

If it be granted that the triplet lens is appreciably slower than the orthographic, foci and apertures being equal, what is the explanation? We think it may depend partly upon the little extra thickness of glass in the former case, and partly upon the fact that the position of the diaphragm and the focal length of the front glass are less favourable. In the orthographic the whole of the condensing is effected by the anterior lens, and the diaphragm being also further off, it follows that more light passes through an aperture of a given size.

Having satisfied ourselves as to the comparative rapidity of the two lenses, we proceeded in the next place to examine them for flatness of field, and in this respect we found the triplet to be superior. Although a shorter focus lens than the orthographic, and one embracing more objects in the field, the greyed glass required less approximation to the lens to define the margins after focussing the centre of the image. With a stop of ·85 inch aperture, eighteen inches along the horizontal line were fairly covered, the aperture of the orthographic for producing a similar result being ·75 inch. A stop of ·6 inch on the triplet gave average definition over nineteen inches horizontally, and corresponded to one of ·5 inch on the orthographic. In consequence of this difference the triplet regained in the matter of exposure all that it had before lost, and on taking pictures at nine and a-half to ten inches from the centre of the field with the above-named stops, that produced by the triplet (·6 inch) was, if anything, a trifle more vigorous than with the orthographic of ·5 inch aperture.

Thus much for rapidity of action and flatness of field. A third point more important than either remained still to be examined. Opticians are aware that the means taken to flatten the field of lenses often tend to introduce another error known as "astigmation," in consequence of which the image loses its sharpness and cannot be brought to a true focus. Having been led beforehand to anticipate astigmation as a probable defect in the triplet, we examined, with great care, the whole of the pictures taken with that lens, and the result was, that with stops of the relative sizes before alluded to, viz., 1·7; 1·2; ·85, and ·6 inch for the triplet, as compared with 1·75; 1·25; ·75, and ·5 for the orthographic, we could detect no difference whatever. In neither case was the picture of the outside of the field equal to that of the centre; but comparing pictures taking at corresponding points, the unassisted eye failed to distinguish them. We think it right to mention, however, that a friend, experienced in the use of the microscope, after submitting the pictures (*not labelled*) to a considerable magnifying power, pronounced in favour of the orthographic. We ourselves also examined the images with a ⅓-inch object-glass, but were unable to decide positively upon their respective merits.

The mode of focussing in the above experiments was that recommended by a friend esteemed an authority on the subject of copying, viz., to focus with the largest convenient aperture, and at a point midway between the centre and the edge of the field. Then, by inserting the diaphragm and taking the picture, there will be an approximation to a real focus everywhere. On consulting a working optician as to the soundness of this method of procedure, he approved of it, stating that the central rays were always superior to the oblique, and that it would be better to favour the latter in focussing.

The camera was placed at such a distance from the object that the image (formed by the lens of shorter focus, viz., the triplet,) measured exactly two-thirds of the size of the original; the general opinion being that the capabilities of the lenses would be better shown by copying on a reduced scale than by reproducing of equal size, since, in the latter case, disturbances would arise not contemplated in the original construction.

In concluding this notice we think it right to express our sense of the energy which Mr. Dallmeyer has shown in bringing out this copying lens. Assuming him to be correct in stating that it gives no perceptible distortion, it appears to us to be an advance on any previously existing form, since we do not find that the above desirable quality has been purchased at the expense of others even more important, such as sharp definition and intensity of the developed negative.

ON THE TONING OF POSITIVES.

By CHARLES HEISCH.

[Read at a Meeting of the Blackheath Photographic Society, February 18, 1861.]

A SHORT time ago I called your attention to the toning of positives. The remarks I then made have called forth a good deal of opposition, and I make no apology for again referring to the subject; because it is so all-important that it cannot be too fully discussed. At the present moment, too, toning is under consideration at the London Photographic Society, so that the time is particularly favourable for a complete investigation. I have been accused of a wish to drive people back to the abominations of sulphur-toning, yellow skies, &c., &c. Such accusations are simply absurd, as any one taking the trouble to read my remarks will at once see. I stated the precise method which had, in my hands, yielded permanent prints, and I am not to be made responsible for the results of a very different mode of proceeding. Some remarks of quite another character, however, appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, from the pen of its much-respected Editor, and to these I replied in a subsequent number of the same Journal. In the current number the Editor has done me the favour to reply to this communication, and Mr. Hardwich has also referred to my remarks; but neither of these gentlemen has really touched the question which I raised.

At the risk of a little repetition I will restate what I consider the weak point in the alkaline process. It is this: that the pores of the paper, when immersed in the hyposulphite, are filled with a mixture of chloride of gold and carbonate of soda—precisely the same substances which are put into the hyposulphite of soda in the modification of the older process which I have for years employed, so that any decomposition which in that process takes place in the bath takes place in the paper in the alkaline process. If any deposit take place in the old bath it can be removed: in the new process it must remain in the paper. The Editor of the Journal above referred to, in his first article, dismissed this, by saying that the pores of the paper were not full of the substances in question, as it was customary to well wash the prints before placing them in the fixing bath. This assertion led me to read over again all that had been written on the subject, to find if any such elaborate washing as is necessary *to remove the solution from the pores of the paper* had been anywhere recommended, and I find nothing of the kind. Mr. Hardwich (one of the great apostles of alkaline toning) simply says—wash for "an instant under a tap;" that is, just remove the solution from the surface, not from the pores, of the paper. We all know the amount of washing required to remove solutions from the pores of paper—witness the time and trouble required in the last washing of our prints—and I fear, if such a washing be needed between toning and fixing, the process would meet with but little favour, and stand a very bad chance of being generally well carried out. In my reply to the first article I pointed out these facts: in the second no notice is taken of the matter; but I am told that I have not pointed out a weak point in the process. I think I have. Mr. Hardwich, while not noticing this point, incidentally makes my objections even stronger than I did, by converting what I spoke of as only probable into a certainty. He says:—"In all cases a liberation of sulphur takes place on mixing the above salts (chloride of gold and hyposulphite of soda), even supposing the free acid to be removed from the chloride of gold by neutralising with a base." Therefore, sulphur must be deposited in the pores of the paper. I also

pointed out, in my letter to THE BRITISH JOURNAL OF PHOTOGRAPHY, what has too much escaped attention, that toning goes on as much in the hyposulphite as in the gold bath, inasmuch as the colour of the prints is totally different, when they leave the so-called fixing bath, to that which they possess when they go in. To what is this colouration due, if not to some reaction between the matter of which the image is composed and the hyposulphite?

The respected Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY adroitly gets out of answering this question by taking hold of my remark, that, if it were not so, ammonia might be used instead of hyposulphite, and says you can use ammonia and your prints will then be the same colour as when they leave the gold bath. Of that I was aware, but it does not affect the question of the prints whose colour has been changed by immersion in hyposulphite. I have never met with any paper which would give agreeable tones if left as they come from the gold bath, and such seems to be the general result of experience. Mr. Hardwich evidently counts much on the change of tone thus effected, and even goes so far as to say that better tones are to be got by using old hyposulphite, which looks to me very much like depending a good deal on sulphur for your tone. My belief is, that the colouring matter of the prints in both processes is the same, and that in the alkaline process you have at least a chance of a deposit in the pores of the paper which you have not in the others. I do not think that the quantity of gold deposited on the picture could materially protect it against any injury this deposit may produce, particularly as on the white parts of the picture no such film of gold exists. Whether this deposit is of any consequence I do not at present pretend to say, but I shall watch it carefully before altogether giving up my old friend.

In reading over again what has been written on this subject, my attention was attracted by one statement which had before escaped me, namely, that papers prepared with chloride of barium could not be used for the alkaline toning. I have, as most of you know, always advocated a barium paper, as yielding more stable pictures and requiring less over printing than others. I continued to use them with the alkaline toning and still found them far preferable. I have recommended them to a good many, and none who have once tried them will ever use any other. All Mr. Heath's pictures in the Exhibition are printed on barium papers, and alkaline toned. I also produce some printed and toned in the same way. The reason given for believing that these papers could not be used is so curious that I can only attribute it to utter inadvertence. It is, that when the barium salts come in contact with the carbonate of soda, carbonate of barium will be deposited. Now, in the first place, when the paper is in the silver bath, most of the barium remains in that bath as nitrate, and what little is left in the paper in the soluble condition (and that only could be affected by the carbonate of soda) is removed along with the free nitrate of silver in the preliminary washing of the prints. Practically, I believe barium papers are very superior as correcting all tendency to a blueness of tone.

In conclusion, I would remark that all authorities—Mr. Hardwich included—are agreed that prints properly prepared by the double hyposulphite process are "permanent"—a word which does not admit of degrees of comparison. I trust that alkaline prints will prove so too; but I cannot admit that experiments with moist sulphuretted hydrogen are parallel with the wear and tear of years. That which would stand the one might yield to the other, and *vice versa.*

It must also not be forgotten that my attention was called particularly to this point by observing signs of fading in some alkaline-toned prints. This must, of course, only be taken for what it is worth; but it is a fact as far as it goes. Mr. Negretti, who is present, must have had great experience in printing, and I should be very glad to hear if he has made any observations on this subject. I produce some prints of various ages—with one exception none *less* than four years old—which show no signs of either fading or yellow skies. Here is also one toned with sel d'or *after* having been fixed in hyposulphite of soda in the year 1851—a process now pronounced by some to be impossible.

NOTES ON THE HYPOSULPHITES OF SILVER.

By JAMES CRAMB.

[Read at the Meeting of the City of Glasgow and West of Scotland Photographic Society, held on the 14th of February, 1861.]

IN the observations which follow on the hyposulphites of silver, it is not presumed that there is much, or perhaps anything, positively new, especially to those who are well read up in the more recent publications on photographic chemistry. But it seemed to the writer that there was not so clear and connected information on this subject readily accessible to most of his photographic brethren as the importance of the subject demanded. Such considerations induced him to allow himself to be named, at the December meeting, as willing to read a paper on the subject.

Holding the opinion that one experiment performed in presence of the Society is in many cases worth pages of exposition, I will repeat as many of the experiments on which my deductions are based as the time at disposal will admit of.

Every photographer is familiar with the use of "hypo.," the familiar abbreviation for hyposulphite of soda on this side the Atlantic. Our cousins on the other side call it "soda"—not nearly so expressive of the use to which we are to make of it, or rather the part of it we are to employ. The photographer wants the services of the hyposulphurous acid; and if he get it he cares not whether it be combined with soda or potash, or any other base.

The purpose proper to which alone hyposulphurous acid is employed in photography is to remove the superfluous silver salts which have not been used in the production of the image. It is the "fixing" agent—though that is not a very accurate designation either. Photography has not been over fortunate in exactness of phraseology and nomenclature.

Trifling though this operation of "fixing" may often seem, the inability to do so successfully was the chief hindrance in the way of the photographic pioneers in the beginning of the century.

The extraordinary affinity of hyposulphurous acid for silver is what constitutes its superiority over other substances as a fixing agent. So powerful, indeed, is this affinity for silver that it forms an exception to the ordinary laws of chemical union. That somewhat singular fact seems to have been overlooked by Mr. Hardwich in the following statement:—"In the solution of silver compounds by hyposulphite of soda a *double decomposition* ALWAYS takes place."* The italics are Mr. Hardwich's. The fact mentioned above was early pointed out and well known. Hear Sir J. W. Herschel, in an article on this subject in the *Edinburgh Philosophical Journal* for 1819:—"The habitudes of oxide of silver in union with this acid (hyposulphurous) are very peculiar. The strong affinity between these bodies is shown by the following facts:—I poured hyposulphite of soda on newly-precipitated oxide of silver; hyposulphite of silver was formed and soda in a caustic state set at liberty—the *only instance*, I believe, yet known of the direct displacement of a fixed alkali by a metallic oxide, *viâ humidâ*. * * * * Thus the affinity between this acid and base, unassisted by any double decomposition, is such as to form an exception to all the ordinary rules of chemical union."†

As mentioned before, it is as a fixing agent we use the hyposulphite of soda. It will perhaps be more intelligible if we say that in future our remarks will be directed alone to its use in fixing paper prints. On a paper print, as it comes from the printing frame, we have chloride and nitrate of silver and *reduced* silver, whatever that exactly is, forming the image. Copious washing in water will undoubtedly remove most of the *nitrate*. It is generally supposed it could all be removed by sufficient washing, but we will by-and-by see *that* is more than doubtful. The *chloride* of silver is known to be wholly *insoluble* in water; but it forms, with hyposulphite of soda, by double decomposition, a soluble compound, thus enabling us to get the chloride out of the paper, without affecting the picture, since the *reduced* silver is not acted on, or but very partially so.

Hyposulphurous acid is composed of sulphur and oxygen, one atom of each. Most, if not all‡, its compounds are composed of two atoms of the acid with one of the base. There seems to be but one compound of hyposulphurous acid with silver, the hyposulphite of silver, composed of two atoms of acid with one of oxide of silver.

Hyposulphurous acid, 2 equivalents	48
Silver 108, oxygen 8	116
	162

Hyposulphite of silver is *insoluble* in water, and extremely *unstable*, passing rapidly into the sulphuret of silver, both of which qualities we shall have occasion very fully to refer to further. Since hyposulphite of silver is insoluble, the photographer would gain nothing by changing the insoluble silver compound, the chloride which he would dissolve out of his prints *into it;* but hyposulphite of silver is soluble in *excess* of hyposulphite of soda,

* *Manual of Photographic Chemistry.* By T. F. Hardwich, fifth edition, page 49.
† *Edinburgh Philosophical Journal.* Vol. I., page 397.
‡ Herschel, *Edinburgh Philosophical Journal,* Vol. I. p. 18.

and forms with that salt a *soluble double compound*, the double hyposulphite of silver and soda. I will not say very decidedly if there is more than one such compound, or how many. This soluble double salt is composed, as I find it, of one atom each of hyposulphite of soda and silver.

Hyposulphurous acid, 4 equivalents	96
Soda	32
Oxide of silver	116

Mr. Hardwich and others speak of the double salt of hyposulphite of silver and soda being composed of *two* atoms of hyposulphite of soda and *one* of hyposulphite of silver. If my statement above be correct, and Mr. Hardwich's also, then there will be two soluble double compounds. Mr. Hardwich speaks of there being *two*,* one soluble and the other *sparingly* so; but as the compound, composed undoubtedly, I think, of one atom of each, is quite soluble, we cannot recognise it as the one called sparingly soluble. In fact I cannot say I clearly comprehend Mr. Hardwich's meaning towards the end of the paragraph in which this sparingly soluble salt is named.

Permit me here to refer to an ambiguity common to most photographic publications in stating the equivalent of hyposulphite of soda. It is set down NaO, S^2 O^2 5HO 125. Now, this salt is composed of two atoms of hyposulphurous acid and one atom of soda, NaO, S^2 O^2.

Hyposulphurous acid, 2 equivalents.....	48
Soda	32
	80

The additional 45, to bring it up to 125, is made up of five atoms of water of crystallisation, which forms no part of hyposulphite of soda except when *crystallised*. Any one can test that by desiccating it, when the water will be found to leave the salt, without in any way altering its properties. The *Photographic News Almanack* makes a graver error in a list of chemical equivalents. Hyposulphite of soda is there set down as containing twelve atoms of water, and its combining equivalent increased to 187. The compiler probably takes sodium at 23, though in chloride of sodium he takes both substances at their highest, and quotes it at 60 (Na^{24} Cl^{36}). Such blundering should, I think, be in every case pointed out, especially in a table intended for reference.

The notes of the behaviour of hyposulphite of silver in a variety of circumstances, which I propose laying before the Society, will perhaps be most intelligently and conveniently given in connexion with the experiments I propose performing.

When a solution of nitrate of silver is dropped into a solution of hyposulphite of soda little by little, a white flaky precipitate is at once formed. On agitation this is dissolved, and again and again, as more silver is added, the precipitate is each time formed and each time dissolved. The precipitate formed is the hyposulphite of silver, which, as before remarked, is insoluble. This insoluble salt, by being agitated in excess of hyposulphite of soda, combines with the soda, forming a soluble double salt. If the addition of nitrate of silver be continued at a certain point the precipitate *ceases* to be dissolved by any amount of agitation. The reason of this is, that there is now too much hyposulphite of silver for all the hyposulphite of soda left to form the soluble double salt. The *permanent* precipitate which at this particular point begins to be formed goes on increasing till as much silver is added as will take up all the hyposulphurous acid in the solution to form hyposulphite of silver. Another property of the hyposulphite of silver is its extreme *instability* now shown. The precipitate is at first quite white, but speedily changes to yellow, then on through orange, red, brown, till finally it becomes quite black. The exact nature of these changes is, I understand, pretty much of an open question among chemists. The silver has changed from a *hyposulphite* to a *sulphuret*. The hyposulphite of silver containing the elements which are required to make up sulphuret of silver and sulphuric acid—

Hyposulphite of silver, AgO S_2 O_2 equals SO^3 and AgS.

Oxygen	3	24	= Sulphuric acid	Oxygen	3	24
Sulphur	2	32		Sulphur	1	16
Silver	1	108	Sulphuret of Silver	Sulphur	1	16
				Silver	1	108

The two solutions separately, before being combined, were neutral; the solution is now highly acid, and if no more silver has been added than just exactly to take up all the hyposulphurous acid from the soda, there should be neither any free silver in solution nor any double hyposulphite of silver and soda. Decanting off the clear liquid, and dividing it into two portions, it can be tested for both salts. If any nitrate of silver be left in the clear solution hydrosulphate of ammonia will show its presence, and the addition of silver will tell at once if any soluble double hyposulphite is in solution, because the addition of more silver will cause the formation of the insoluble compound.

The next experiment is intended not only to bring out more clearly the fact that hyposulphite of silver immediately on being formed, and no free hyposulphite present, begins to pass into *sulphuret*, but also the very important fact, that in presence of chloride this change to sulphuret either never begins or is at any point in its progress stopped by being brought into contact with a chloride. To show this clearly, hyposulphite of soda and nitrate of silver are mixed in equivalent proportions so as to form the insoluble hyposulphite of silver. Half is immediately thrown into a solution of chloride of sodium; the white precipitate remains white, and retains the property of combining with hyposulphite of soda to form the soluble double salt. The half left changes, as before described, from white to yellow into black, and is quite insoluble in water or in hyposulphite of soda: it has become sulphuret of silver. The other, that added to the chloride, remains hyposulphite of silver.

The next experiment to which I call the attention of the Society is that if a drop of solution of nitrate of silver be added to a strong solution of hyposulphite of soda *without* agitation, the insoluble hyposulphite of silver is formed, as it were locally, and passes, as pointed out above, into the *sulphuret*.

The fourth experiment with hyposulphite of soda and oxide of silver shows what has been before observed regarding the exceptional character of this combination. It will also show the quantity of hyposulphite of soda required to form the *soluble* double salt with oxide of silver. If 250 parts of hyposulphite of soda be added to 116 parts of oxide of silver the soluble double salt is formed, proving its composition to be one atom of each of hyposulphite of soda and hyposulphite of silver—NaS^2 O^2, AgO S^2 O^2. The combination of hyposulphite of soda with oxide of silver also brings out the fact that with oxide of silver you never can form the insoluble and unstable compound: if excess of oxide of silver be added it just remains as excess, and the double soluble hyposulphite remains also.

The fifth experiment I perform is the addition of hyposulphite of silver to chloride of silver: the chloride is dissolved, but at no point is the insoluble hyposulphite ever formed, consequently the sulphuret can never be formed either.

This experiment is undoubtedly one of the highest practical value, as showing that if we could turn all the silver in our prints into chloride before immersing them in the hyposulphite it would be quite impossible to form the insoluble hyposulphite of silver, from the formation of which, in more or less quantity, arise the yellowing and browning of prints, and the various kinds of measly spots and other ills we are all so afraid of, with so much good reason. These brilliant hopes looked well on paper, but on trial, so far as my experiments have yet gone, I have found it *impossible* to remove all the nitrate from the paper by prolonged soaking in a chloride. Whether it be that the nitrate enters into combination with the size of the paper, from which the chloride is not able to dislodge it, or whatever else may be the explanation, I give the bare fact of my experience.

The practical conclusions I would wish to draw from the facts brought out are:—1st. The great importance of removing as much of the nitrate from our prints as possible, before we proceed to the fixing, as lessening very much the risk of sulphuration. 2nd. The necessity of strong hypo. to ensure its being able to furnish as much hyposulphite of soda as needful to form the soluble double salt with the silver to be converted. 3rd. The advantage of draining the prints before immersion in the "hypo." to avoid diluting it, and thereby deceiving us regarding its strength. And lastly, and most important, the necessity of agitating the prints while in the hypo., turning them frequently over and over, otherwise the insoluble compound may be formed, though there be quite strong enough hypo. in the dish. The experiment with the hypo. solution and the single drop of silver solution, gently added, shows the evil of trusting to strong hypo. alone, without agitation.

* *Manual of Photographic Chemistry*, fifth edition, p. 50.

A NEW METHOD OF PREPARING PURE NITRATE OF SILVER FROM METALLIC SILVER ALLOYED WITH COPPER.

By Thomas A. Barber.

[Read at a meeting of the North London Photographic Association, Feb. 27th, 1861.]

One of the simplest plans for recovering silver from an old bath is that of immersing a piece of copper, slightly acidifying the liquor, and leaving it until the whole of the nitrate is decomposed, and the silver falls in a metallic powder. In this case, however, the pro-

duct is contaminated with copper, from which no amount of washing will free it.

My method of proceeding is this:—After well washing and drying the precipitate, I add carbonate of soda, or borax, and fuse it in a crucible, by which a part of the copper is eliminated. It is then poured out into cold water, bringing it into a granular and manageable form.

The solution of the silver in nitric acid is effected in the usual manner; but evaporation is carried on until the resulting mass begins to fuse, so as to drive off the excess of acid.

The salt is then rubbed in a mortar with a little oxide of silver, distilled water added, and the whole boiled. The oxide of silver displaces the copper, which falls as an oxide, and is separated by filtration, together with any excess of oxide of silver.

The liquor is then a solution of pure nitrate of silver, containing a small amount of oxide of silver, which must be neutralised by the addition of nitric acid, if evaporated for crystals, or by acetic acid, if transformed into a negative bath.

I fuse the silver and afterwards the salt, in order to economise the use of the oxide, otherwise there can be no reason why the pulverent silver should not be converted at once into a nitrate; for the oxide will rectify a solution containing both copper and acid—in fact, nitrate of copper may by the same means be converted into nitrate of silver.

The difficulty in this process is, to arrive at the proper quantity of oxide to be used without wasting it. This may be ascertained by testing portions of the boiling solution with ammonia, and adding the oxide gradually, till every trace of copper has disappeared.

The method generally recommended to get rid of the copper is to fuse the mass until the nitrate undergoes decomposition. The nitric acid is drawn off and oxide of copper remains; but the high temperature necessary for this operation involves the danger of forming nitrite.

Another plan has lately come under my notice. It is to wash the deposited metallic silver with weak hydrochloric acid, and then with ammonia. I have tried the experiment, but did not find it succeed: copper was still left and chloride of silver formed.

If nitrate of potash be preferred in place of nitrate of copper, it may be readily effected by dropping into the boiling solution some caustic potash. The product will then be contaminated with nitrate of potash instead of nitrate of copper.

I give my method more as a chemical fact than as a useful addition to photographic operations; for I have long held the opinion that nitrate of copper is no bar to the working of nitrate of silver, and this Mr. Taylor, at the Photographic Society of Scotland, proved to be the fact.

Most of our baths contain potassium, cadmium, ammonium, and very likely calcium, sodium, &c.; and why object to cuprum? The salts of this metal, are, I believe, just as free from actinic action as the others. Still it is of some service, and no little pleasure, to deal with a genuine article.

REMARKS ON MR. CRAMB'S PAPER "ON TESTING USED SILVER BATHS," &c.

By C. Jabez Hughes.

[Read at the meeting of the North London Photographic Society, February 27, 1861.]

Since our last meeting, at which I read a paper on estimating the amount of silver in nitrate baths, &c., another in reply has been read by Mr. John Cramb, of Glasgow, in which he alludes to experiments made by his brother somewhat similar to those undertaken by Mr. G. Wharton Simpson and myself, the results of which are considerably different to our own. So far, then, we have two series of recorded experiments on the same subject, each tending to a different conclusion. This is unsatisfactory; for either one or the other, or possibly both, may be wrong. A re-examination of the subject is obviously suggested, and I am sure you will be gratified when I inform you that this is now being done by gentlemen whose names will be a guarantee both for the accuracy of their results and their ability for the task, and that at our next meeting I hope to lay before you an interesting report, from which we may deduce safe conclusions, not only on the question in dispute, but on kindred points affecting the theory and practice of photographic printing.

For my own part I have no object to serve but the elucidation of truth, and its application to daily wants. If it shall occur that the views I have expressed are not substantiated when tested on a wider basis, I shall have pleasure in being set right, and shall cheerfully embrace the new views; for, after all, better men than I have committed themselves to positions which enlarged experience has not allowed them to maintain.

Awaiting, therefore, respectfully but anxiously, the advent of this trustworthy information, I would leave the matter, were it not for the tone in which Mr. Cramb has chosen to couch his comments on my paper; and for fear that my silence might be misconstrued.

That he should dissent from my views was quite reasonable—for if we all agreed there would be no discussion—and that he should endeavour to show where he supposed me to be in error, was not only allowable but highly commendable; but there is a proper and courteous method of doing this, which, to the credit of photographers, is rarely departed from. Why Mr. Cramb has so done I cannot surmise, unless it be that this being his first paper addressed to any photograhphic society he is unaware of the amenities usually expected.

For my own part I am always too happy to be taught, but I can never submit to be coerced; and, while bowing with submission to any one who will point out my faults, and thanking them for the act, I distinctly deny the right of any to do it in offensive language. I claim to be treated with ordinary courtesy and respect; and if in the present instance I somewhat depart from the usual course, it is to remind Mr. Cramb that in criticising papers read before societies he must endeavour to avoid ebullitions of jaundiced and splenetic feeling.

I do not propose to follow him through his paper—the whole purpose of which appears to be to pervert and distort my views—and will only remark on the experiments themselves. They are based on the principle of inferring the amount of nitrate of silver in a solution from the quantity of a standard solution of chloride of sodium required to cause complete precipitation. In the use of this method I pointed out several sources of error. These experimenters have adopted one of these sources, viz., using only a fluid drachm to estimate the quantity in an ounce of solution, whereby an error becomes magnified eight times.

What means, if any, were taken to ascertain the accuracy of the fluid drachm measure are not explained. As many of the bath solutions examined were very concentrated, the error of a few minims either way, especially when multiplied by eight, is very grave.

Again, as the results of this method are obtained by indirect, not direct, experiment it is of the greatest importance that, as a collateral check, a solution of *known strength* should be tested in the first instance. This was done by Mr. Simpson and myself, but these gentlemen, in the plenitude of their confidence, did not seem to think it necessary.

They must needs make a blunder in the equivalent weight of chloride of sodium, taking 60 instead of 58·5. This alone makes an error in all their calculations of one grain in forty, or two and a-half per cent.

The results obtained from Mr. Bowman's bath are so hostile to general experience that that alone is enough to throw doubt on all their figures.

Why was the hydrometer tried on collodion baths at all, seeing that I more than once distinctly stated that it was not suited for them? yet in their array of figures they parade no less than *five* collodion baths.

It may be remembered that Mr. Cramb had already condemned this instrument, confessing in the same breath that he had never tried it!—a mode of proceeding not calculated to favourably prepossess one as to his impartiality as a judge, and certainly the contrary of what is adopted by the usual investigators of "chemical and hydrostatical science," about which he talks so complacently Having established his conclusions to his own satisfaction, he should when he selects his facts and adduces his figures, bring some, independent third party as a voucher, being himself far from an unexceptionable witness in his own case. This confirmatory evidence is not supplied. I therefore dismiss these unverified figures.

I have not attempted to reply at large to Mr. Cramb's paper; for, after all, the point in dispute is not one of argument but of fact, and as the question must be re-opened shortly we may patiently wait. My main object has been to resent the tone in which it is written; and, in dismissing this provincial censor, I trust when he next makes his appearance it will be with a more becoming deportment, and that in alluding to persons with whom he may disagree he will make an effort to use inoffensive language.

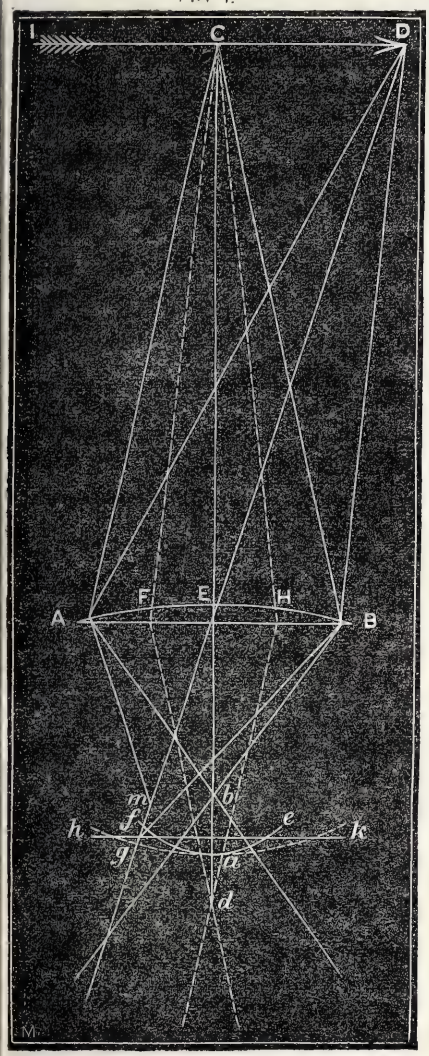
PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. II.

In continuing the subject of my first paper, C *(Fig. 1)* is the point of reflection, the rays from which are supposed to fill the whole hemisphere, the base of which is I C D; but that portion only which is included between the lines C B and C A is incident on the lens. A B is the lens, which I will take to be plano-convex non-achromatic, and *a* the point or focus to which the rays are supposed to converge. I say supposed, for reasons which will hereafter appear. C E *d* is the axis of the lens.

FIG. 1.



I would remark here that the reader must confine his attention closely and solely to the lines and points as they are successively referred to, and as if there were no other lines, points, or index letters present on the paper, because the figure is somewhat complicated.

I will now take a second point of reflection D, which is the point of the arrow D C I: this point reflects rays in every direction, similar to the point C, a portion of which strike the lens obliquely, and are supposed to be converged to the point *f*, forming there an image of the point of the arrow.

If we now suppose the half of the arrow betwixt C and D to be so full of points of reflection that the eye cannot distinguish any intervals betwixt them, and the rays reflected from all those points to be refracted and converged to so many points between *a* and *f* as to fill up that space, then we shall have a picture of the half (C D) of the arrow complete from *a* to *f*. By the same reasoning it will be evident that the image of the other half (C I) of the arrow will in like manner be depicted complete from *a* to *e*, and so a perfect picture of the whole of the arrow will be thus produced. This is so simple and clear that, in connexion with what I have before stated about the reflection of light, the dullest intellect must comprehend it.

From the foregoing another mystery (to many people) will with equal perspicuity be unravelled, viz., the inversion of the image. It only requires to be seen to be understood; for as the rays from the point D of the arrow strike the lens obliquely, and are converged to a point *f* on the opposite side of the axis *c d*, and the rays from I, the other end of that arrow, are incident on the lens obliquely, and converged to the point *e* on the right-hand side of the axis, it is manifest that the point of the arrow which was *up* is in the image *down*, and the bottom end is *up:* thus the whole arrow is inverted. Can anything be plainer? Yes: ocular demonstration. Then the following experiment will be an interesting ocular demonstration of the truth of what I have before advanced on the formation of the image and its inversion. Place a camera of any size on a table; put a lighted candle two or three yards in the front of it; the flame must be about on a level with the lens, say on the point C in *Fig.* 1. The room must be in darkness, except the light of the candle—no focussing glass is needed. Now fill the camera with steam or tobacco smoke, and it will be distinctly seen how the lens converges the light to a focus, the light from the lens to the focus being nearly in the form of a cone, A *a* B. Next, let an assistant move the light sideways from C to D, and it will be clearly seen when the light is at D, after having moved from C to D, that the cone of rays will point to *f;* and, when at any intermediate point between C and D, the cone will be directed to a corresponding point between *a* and *f*.

What is here demonstrated with regard to the formation of the image of the arrow holds good with respect to the formation of the image or picture of any other object, in whatever part of the view it may be situated, although affected in numerous ways by being in different parts of the view (which will be hereafter explained), the light from which is incident on the lens. Now, if three lights are put in positions—one at I, the second at C, and the third at D—then by looking in the camera, as previously directed, three distinct cones of light and the three images will be finely seen. If instead of three lights a large number were placed, it is very plain that there would be images of all of them in their proper places in the picture, and as situated in the view. Therefore it will be clearly comprehended how every object in a view is rendered approximately correct, and the whole picture thus completed in every part.

I have heard this simple, perhaps it may be called silly, question asked:—How is it that the image is not clear or properly defined anywhere but at the focus? Well, to answer that, put the focussing glass in the camera; slide it a little nearer the lens than the focus; then, taking the three points of reflection, I C D, it is seen that the light, after passing the lens, strikes the ground glass *before* it arrives at the focus. Therefore, in place of being converged to a fine point at the focus, it forms discs or circles on the ground glass—that is, extended, confused images; and, if the glass be brought very near the lens, the three cones of rays will cross each other on the glass, and thus make "confusion worse confounded"—and the greater the number of lights or points of reflection the greater the confusion. On the other hand, if the focussing glass is at a point beyond the focus similar effects take place, in consequence of the divergence of the rays after passing the focus. In few words, the image of a point, line, or any other object, is not properly defined unless some portion of the rays which issue from them are collected to a similar fine point, line, &c., which occurs at the focus and nowhere else.

Having now given a general explanation of the formation of the photographic picture, I will proceed to treat the subject under distinct heads, the first being

THE FOCUS,

which is a Latin word, signifying hearth, fire, or fire-place, the term being used to denote the point to which rays of light and heat converge—no doubt because when a sufficient quantity of the sun's rays are concentrated by a lens or speculum, they will ignite combustible matter, and thus it becomes the fire-place or focus. All practical photographers as well as opticians are aware that one part of the image on the ground glass will be in good focus when other parts will be bad, especially with a large aperture. There are several reasons to account for this, such as curvature of the image, astigmatism, difference in the distance of objects, &c.

Another effect has often been noticed, which besides being troublesome is to many novices incomprehensible, viz., that, although the image appeared perfectly sharp and well defined on the ground glass, the picture when taken was indistinct and apparently out of focus. This might arise from three causes:—1st. The plate on which the picture was taken might not occupy exactly the same position that the ground glass did, from having been pushed in or out a little.—2nd. Vapour might have condensed on the lens.—3rd. The luminous and actinic foci might not be coincident. The two former would be easily remedied, but the latter not so readily. Perhaps I ought to state here that the luminous or optical focus is the point to which the luminous rays are converged, of which yellow is the chief; and that the actinic focus is that to which the actinic rays converge, violet being the principal. It is necessary to make another observation here also, and one which all photographers should remember, that is, *when a prepared plate is in good focus the picture is not only sharp, but struck in a shorter time, that is, with a less exposure than if it is a little out of focus.* Mark that well. As this may be disputed, it will be as well to give several examples in support of it. The first is, if a picture be taken, having a large field of view, with a moderately sized stop, the marginal objects not being in very good focus, and none of the light of the oblique pencils cut off by the tube or other obstruction, it will be seen that the centre, which is in good focus, is lighter, or apparently more exposed than the margin, both of which will, of course, have been exposed the same length of time—the reason being, that a portion of rays, instead of coming to a fine focus, are scattered, thereby depriving the focal point of a proportionate acting power; but if a

small stop is used this effect does not occur, because all the field is in good focus, and therefore struck with equal power throughout. 2ndly. If in taking one picture an inch stop is used, and in another half an inch, all other conditions being the same, the former (according to the rule, the squares of the diameters) ought to be struck in a quarter of the time of the latter; whereas I find in practice that the half-inch stop will produce the result in only three times that of the inch. The same relative effects take place with half-inch and quarter-inch: thus the quarter-inch will effect the object in only nine times that of the inch, instead of sixteen times. This I attribute to the more exact concentration of the rays to the focus when small stops are used than is the case when large ones are employed. Another example by similarity is, when the sun's rays are converged to a focus a dry combustible substance will be ignited thereby; but if the substance be moved nearer to or further from the lens it will not be ignited. The deduction from all this is—the finer the focus the quicker and better in every respect is the resulting picture. Give me a good focus and sharp clean picture.

ON THE PRINCIPLES OF COLLODIO-ALBUMEN PHOTOGRAPHY.

By Thomas Sebastian Davis.*

In continuation of my report in elucidation of the principles involved in the preparation of dry plates, I have to record the general results of my experiments in connexion with the employment of albumen in unison with the excited collodion film. The practical difficulties that have beset the use of such plates may be described as consisting in a rapid deterioration after preparation, the want of uniform sensibility, liability to blistering, and a general tendency to stains and markings. With regard to the first difficulty, viz., deterioration after preparation, a lengthened experience leads to the inference that free nitrate of silver, in union with albumen, forms a compound prone to decomposition. It becomes, therefore, a question of primary interest to ascertain how far the sensibility of the collodion film can be preserved, without bringing the albumen into collision with free nitrate of silver. To ascertain this point I prepared a plate by covering it with collodion, decomposed the sensitising salts in the usual nitrate of silver bath, and then washed thoroughly with an abundance of pure water. I then poured over its surface a mixture of dilute albumen, and finally treated it with water at a high temperature (about 200° Fah.). Upon developing the picture, after an exposure of ten minutes, with a Ross's stereo. 4½-inch lens, in a fair light, I obtained a result which indicated slight under-exposure. It seemed to me desirable to ascertain in the next place whether, under similar circumstances to the above, pure iodide of silver be more or less sensitive to the actinic impression than the iodide of silver in combination with the chloride and bromide. In pursuance of the inquiry, I first prepared two samples of collodion: the one I sensitised with iodide of cadmium alone, and the other with a combination of iodide, bromide, and chloride salts. I then prepared two plates with the iodised collodion, and upon removal from the nitrate of silver bath subjected them to a prolonged washing in *pure* water. The one was preserved with my raisin extract preservative solution, and the other with dilute albumen, and each subsequently washed, dried, and exposed. Two other plates were next prepared with the collodion, containing both chlorides and iodides in solution, plunged into a solution of chloride of ammonium, then washed freely with common water, treated respectively with the raisin extract and albumen solution, and lastly washed and dried. It will be noticed by the above treatment we obtain two films containing iodide of silver, and two others, in which the iodide is in intimate admixture with the chloride. In comparing the relative sensibilities of two photographic surfaces to the action of light, I have found it necessary to expose them simultaneously, otherwise the variation in the actinic intensity, within a few minutes, is calculated to lead to false inferences. To avoid any source of error from this cause, I exposed the plates, prepared as above, in two cameras, fitted with corresponding lenses, and found, on development, that under the above-mentioned circumstances the iodide of silver, *plus* chloride of silver, gives evidences of possessing a greater sensibility than iodide of silver *minus* the chloride. The relative difference may be estimated as three is to four in respect to the plates prepared with the raisin extract, and as two to three between the two prepared with the diluted albumen. The above experiments indicate, however, that the collodio-albumen plates can be preserved in a sufficiently sensitive condition for general landscape purposes, without the conversion of the albumen into the compound that is recognised (whether correctly or not) by photographers as the albuminate of silver. It seems, however, desirable to ascertain the proportionate sensibility between a plate prepared with or without the formation of the albumino-nitrate of silver compound. Perhaps the most sensitive surface that can be produced of this character is by following the Taupenôt process, and using the second bath in a neutral state. Although the plate in this condition is exceedingly deficient of keeping qualifications, it yet possesses considerable sensibility. The result of some comparative observations upon the subject leads to the inference that Taupenôt plates so prepared have about twice the average sensibility of those containing a combination of iodide and chloride of silver, and preserved with plain albumen. I do not find that any increased sensibility is attainable in the latter instance by treating the washed albumenised plate with a solution of gallic acid. I am inclined to deduce, as a general inference, from varied experiments on the subject, that a layer of albumen intervening between the silver salts and the excited collodion film, or the presence of insensitive salts upon or within its interstices, are directly antagonistic to photographic action. Without having recourse, therefore, to any theoretical speculations with regard to physical modifications of structure, we are enabled to explain satisfactorily the principles on which the various modifications that have been successfully applied in connexion with collodio-albumen photography depend for their practical value. It will be noticed throughout that, in those cases in which the albumen does not contain iodides, it need not be brought into contact with the nitrate of silver solution, but that it becomes advisable, as noticed by Mr. Fothergill, to remove from the surface of the film the greater portion of the insensitive coating. If the albumen has become desiccated, or partially so, by spontaneous evaporation, it will be found more efficacious to use hot than cold water to effect its removal. The superior efficiency of the former will be apparent if we coat a piece of glass with liquid albumen, dry it at a high temperature (say 200° Fah.), then attempt to wash it from the surface of the glass by the aid of cold or boiling water. It will be noticed that, although the layer of albumen resting simply upon the surface of the glass is not coagulated by the heat applied, it has been rendered less easily soluble in cold water. If, moreover, we dip the glass covered with the thin film into boiling water, we shall not find that any opacity is produced indicative of a structural alteration in its character. Although I am inclined to the belief that the same reasoning would apply to a layer of albumen resting upon the surface of the collodion film, yet we do not possess any demonstrative experiments to show that it would equally be applicable to the portion retained within the interstices of the film, in intimate proximity with the metallic salts. At all events it is to be observed that those experiments which have been adduced in favour of increased sensibility attributed to structural alteration, are explicable upon the simple principle of a removal of the insensitive or even antagonistic influence of the preservative agent. Regarded in the light of the theory advocated, in conjunction with the fact of the possibility of preserving the sensibility of the collodio-albumen compound, without the necessity of bringing the albumen in contact with free nitrate of silver, as shown by my experiments, we can easily understand the unity of principle existing between the preparation of plates by the Fothergill, Petschler, and other published methods of manipulation.

I have now, in conclusion, to offer an opinion with reference to the best practical method of preparation; or, in other words, the one which offers the greatest number of general advantages as a dry plate process. As the preference must be made in subordination to special requirements, it is advisable to state that the leading qualifications which I consider a dry-plate process ought to possess are these:—facility and readiness of obtaining uniformity of preparation, moderate sensibility, certainty of results, one sensitising bath, and considerable keeping qualities. I am inclined to think that the great care that would be required to preserve plates in an unimpaired condition, the lengthened period of exposure during preparation and development, the necessity for the avoidance of any contact with deletereous vapours, would militate against the utility of dry plates possessing equal sensibility with ordinary wet ones, when required for general landscape delineation. In those cases in which a greater sensibility than one-half or third of that of wet collodion be requisite, the balance of advantages will in all probability remain in favour of the wet or preservative process.

In subjection to the above considerations and experiments, and to meet the exigencies of ordinary landscape or still-life photogra-

* In continuation of the Report of the Experimental Committee of the South London Photographic Society upon the Dry Processes.

phy, I have devised, and would generally recommend, the following collodio-albumen dry process:—

Take six fluid drachms of any good negative collodion of a non-contractile character, and add thereto two drachms of the following sensitising solution:—

Iodide of potassium	8 grains.
Iodide of cadmium	16 „
Bromide of ammonium	2 „
Chloride of ammonium	1 „
Alcohol ·805	6 fluid drachms.

Digest for three or four hours with occasional agitation, carefully filter, and add two additional drachms of alcohol so as to make up to one fluid ounce. Sensitise the plate in the ordinary 35-grain neutral nitrate solution, immerse in a dish of (pure) water, to which has been previously added a drachm or two of a 5 per cent. solution of chloride of ammonium, remove and wash thoroughly with ordinary filtered water. The plate is then to be covered with the following preservative solution:—

Raisin extract solution (Raisins 1 fluid drachm, water 5 fluid drachms)	1 ounce.
Albumen	1 „
Ammonia	10 minims.

Agitate the whole together in a large bottle, and filter through sponge just before using.

The first quantity applied should be made to flow over the plate in a continuous wave, and be poured off at once from the opposite corner; the second should be permitted to remain thereupon not less than a minute. The plate is now to be washed freely with filtered water applied from a jug, or other convenient manner, then stood on end to dry spontaneously, or by the application of a gentle heat, and is ready for use. After exposure the dry plate should be moistened with distilled water, and developed with the following solution:—

Pyrogallic acid	1½ grain.
Citric acid	½ „
Water	1 fluid ounce.
Alcohol	10 minims.

Add to each fluid ounce about half a drachm of a 15-grain solution of nitrate of silver. Fix with hyposulphite of soda, wash, spontaneously dry, warm, and varnish as usual.

ON PHOTOGRAPHIC AND STEREOSCOPIC PORTRAITURE.

By Sir David Brewster.

[Abstract of a Paper read at a Meeting of the Photographic Society of Scotland, February 12th, 1861.]

He had already shown, he said, in a former paper, which had been published some time ago, that all pictures which had been taken with lenses of a large diameter consisted not of one, but of an infinite number of incoincident pictures; and at that time he had exhibited specimens of portraits taken with such lenses, and also some taken with a very small lens. The result of the employment of a lens of large aperture was to swell the human face, and was the principal cause of the imperfect likenesses which so often issued from the studio of the photographer. In the delineation of spheres, the influence of large apertures was very perceptible. The true representation of a sphere varied with the distance of the point of sight, while the photographic representation varied not only with this, but with the aperture of the lens. Hence, in taking a subject for a sculptor, to make it of real value to him, the photographer must accompany it by a statement of the aperture of the lens employed in taking it, and also the distance of the object from the camera.

If they placed a lighted taper a certain distance behind an object which was smaller in diameter than the lens, and took a photographic representation of it, the image of the taper, although very much enfeebled by the interposing object, will be introduced.

The imperfect homogeneity of the glass in a large lens produced errors both in form and expression; while the false light introduced into the camera by means of the reflection from its surfaces operated detrimentally towards procuring an image free from haze and indistinctness.

In speaking of the faults inherent in many photographic portraits of the present day, Sir David said that some of these faults arose from an error in placing the sitter. He was always placed *too near* to the camera. The effect of this was to render prominent objects disproportionately large. It was quite common to hear complaints as to the size of the hands, but it was equally the same with the other features—the nose for instance. These were all consequences of the sitter being placed too near the camera; and although in the case of the hands a remedy was sought by placing them as near as possible to the body, yet this was unpleasant from the effect of constraint given to the portrait. The obvious remedy for these errors was to remove the sitter to a considerable distance from the camera; and the more parallel were the rays from the object to be taken, the more perfect would be the picture. Sir David illustrated the application of this principle by supposing a sculptor about to copy the *Apollo Belvidere* from different points of view; by not attending to this, lights and shades were thrown into the picture which were not visible to the artist, whether he looked with one or both eyes.

In looking at solid objects, the right eye sees objects not visible by the left, and *vice versa;* while on looking with *both* eyes at a particular object, that object would be seen under greater illumination. If instead of two eyes, we had a hundred, we should, on looking at any object, see it very much increased in brightness, but we should also have a representation of it from as many points of view as we had eyes. So it was with a large lens. It would introduce into the camera all the rays which superinduced upon it, and therefore would introduce a number of rays which a painter would not see. These were not mere opinions, but demonstrable truths, and it was the duty of the professional photographer to aim at the greatest perfection to which his art could attain. To approximate towards such perfection, Sir David suggested that the large achromatic lenses at present in use should be superseded by rock-crystal lenses, a quarter of an inch in diameter, the use of which, coupled with placing the sitter much farther away from the camera than was usually done, would render any errors quite inappreciable. Such a lens would transmit a great many of the actinic rays.

He would at a future meeting exhibit a series of portraits of the same individual, taken by different eminent photographers, and it would be interesting were others to do the same. He would defer till another opportunity his remarks on stereoscopic portraiture, seeing there was so much other business before them.

THE PRACTICAL DETAILS OF THE FOTHERGILL PROCESS.

By Frank Howard.

[Read at a Meeting of the South London Photographic Society, February 21, 1861.]

I feel that some apology is due to you on my part for venturing to engage your time about a subject of which so much has been said and written, namely, the Fothergill dry collodion process. However, having been requested by your Committee to lay before the members my process of working, I have ventured to do so, nothing more pressing being before the Society. In the first place, I desire to intimate to you that what I have to say is pre-eminently practical, and nothing will be brought forward or asserted in this paper that I have not tested and proved myself; and, at the same time, I would say that my remarks are more addressed to those gentlemen who would desire to produce pictures, than to those who are more inclined to experiment or draw comparisons.

The bath I use is the ordinary negative bath of not less than thirty-five grains to the ounce, and not more than forty, carefully filtered, possessing faint acidity, and tested with a wet plate before commencing to prepare dry ones. The glass I use is the best polished flatted crown, which possesses as fine a face as patent plate, and, after rejecting all curved and thin pieces, is much cheaper and less weighty. The albumen I prepare by obtaining the white of one egg (which you will obtain best and most free from germ by making two moderate-sized holes, and blowing the egg, after the fashion of boys of bird's-nesting experience); to this I add three parts of water, common or distilled—a little more or less does not matter—beat it well with a silver or wooden fork, or place in a bottle and well agitate till it is all froth. I prefer the bottle, as it is less messy, does not require pouring from one vessel to another, as you can see at once if it has mixed properly; as it will frequently happen, even with distilled water, that the albumen coagulates, and the mixture is full of white opaque flakes, and when rubbed between the fingers is not tackey, and does not possess the gummy feeling which dilute albumen ought to have: this must be thrown away, and a fresh lot mixed. It will generally be found that the clear white of an egg is very nearly one ounce in measure, you will therefore have four ounces of dilute albumen, which will prepare three dozen stereoscopic plates: if you now add some 60 to 100 drops of strong liquor ammonia, and well agitate, you will find the mixture much clearer, and if left for a few hours it is very transparent.

The collodion is the most important item of the process. Pictures may be obtained with any good collodion; but the plates will have all the characteristics, except sensitiveness, of the collodion, and in an exaggerated degree. For instance, the collodion which gives dense negatives used wet, will give denser if used dry; the long development will tend much to assist density: the collodion possessing half-tones will be liable to stains and marks, and will generally lack density. The skies printing through, and a difficulty of avoiding stains, is a very strong feature.

I have, during last summer, tried a great many descriptions of collodion, and those possessing an abundance of half-tones have invariably shown stains in drying, quite apparent before development—always occurring in the same place, namely, the upper half of the plate, when drying, as I have watched them appearing, they being quite apparent if the plate is held so that the light falls obliquely on it. I can only account for this by imagining that the washings have a disturbing effect upon the sensitive film, and tend to separate and cause a crystallisation of the iodides or bromides in the collodion. To prevent these markings I have employed, with some success, the following mixed collodion:—Three parts of a collodion giving half-tone to one of a dense collodion, both having been iodised some days: this gives a creamy, powdery film, which is very desirable, and, indeed, necessary to success.

I will now proceed to describe my method of manipulation. Having the bath ready, and the plates cleaned a few hours before, I take a clean plate and lay it between two pieces of clean blotting-paper, and place upon the top a flat bottle filled with hot water; in the meantime get the collodion bottle, free the neck from dry pieces of collodion, and get the plate-holder, slightly damping the edge of the india-rubber; remove the plate, brush both sides with a broad camel-hair brush, and, being sure that the glass is not too warm, attach it to the plate-holder; coat with collodion, allow it to set, and immerse in the bath. I then take a clean funnel, and push with a porcupine quill a clean piece of sponge into the neck (not too tight) and filter into a clean measure the dilute albumen. Whilst filtering I move the plate up and down in the bath (perhaps it is as well to commence filtering the albumen an hour or so before, as it is a tedious operation). I now take a clean dish a little larger than the stereoscopic plate, and pour into it about three ounces of filtered rain, distilled, or filtered common water, which has been boiled, and, having removed the plate, drained and wiped the back, place it in the dish. I then hold it on a level with the eye between me and the light, and incline it at an angle sufficient to cause the water to flow completely over the plate to the other end of the dish, then back again until all greasiness has disappeared, *and one turn more*, remove the plate, and stand to drain on a clean pad of blotting paper (meanwhile get another plate and place under the hot water bottle); then attach the sensitised plate, after wiping the back, to another plate-holder, and pour along one edge enough filtered albumen to flow evenly across the plate; then let the surplus fall off the other side, put the lip of the measure to the edge of the plate, and carry the albumen round the edge; flow the albumen still on across and across the plate three or four times, then drain off, and place the plate in another dish of water, enough to cover it; having done so, dip your fingers into a basin of clean water and wipe them, remove the second plate from under the bottle, and coat that with collodion and place it in the bath. Now take the dish of water containing the first plate and agitate so as to cause the water to flow across the plate, some thirty times; throw out that water, and fill again, not allowing the water to fall on the plate from the vessel; again agitate as before, throw away, and a third time fill the dish with water and agitate; then remove the plate, stand on blotting paper, and wipe the back; then remove and place in a cupboard or box, free from dust or light, to dry spontaneously; standing it so that it rests on the corners, thus the right hand top corner on a clean piece of blotting paper, the left hand bottom corner against the wall, or side of the box—your other plate will, after moving up and down in the bath, be ready for the same treatment. By pursuing this method of washing, you obtain a perfectly even sensitive film far more easy than by confining the amount of water to four or six drachms, and much less liable to stains or insensitive patches as will be obtained if you wash under a tap.

Plates thus prepared I have kept for a month: they possess a high degree of sensitiveness. I have obtained good negatives in forty to sixty seconds of well-lighted subjects. Drying by artificial heat I do not approve of: it has never given satisfactory results in my hands; indeed, I believe it is to the power of albumen, gums, gelatine, and sugar to retain an impalpable moisture, that apparent dry-plate photography is successful, and if you drive the moisture off by artificial heat you decrease the sensitiveness. This is a matter which I venture to call our Experimental Committee's attention to. The plate may advantageously be varnished round the edges, or albumenised with a camel-hair brush, as it prevents the film slipping in washing off after developing.

The development I perform with pyro. 2 grains, citric acid ½ grain to the ounce of water, silver solution, fresh filtered, of 10 grains to the ounce. Iron developers I have never tried.

I do not pretend for one moment that this method is superior to any other; I can only say it has answered in my hands perfectly well. I regret that I have not more specimens to place before you; but if any gentleman desires, during the forthcoming summer, to bring back the reminiscence of a trip into the country, or any object of interest, I should be glad to hear he had given this method a trial, as I have little doubt of his success and consequent satisfaction.

A few words upon development may not be out of place, as more plates are spoilt during development than in any other method. Moisten the film all over evenly and rapidly—the best method is by immersion in distilled or filtered rainwater; have ready sufficient developer in a clean measure to cover the plate, remove the plate from the dish, and rapidly attach it to a plate-holder, keep the moisture well up to the edges, *they are apt to repel the moisture*, and the touch of the finger at the edge or back of the plate driving the moisture rapidly away, the consequence of which is that the developer will not pass over those parts; cover the plate well with developer without silver, on and off two or three times, then add, say, two drops of silver solution *fresh filtered*, to the drachm of pyro. solution, well mix; again apply the developer, and if properly exposed the picture will soon appear; at the least sign of turbidness you must throw away the developer and mix fresh, washing out the measure; a peculiar characteristic of a good plate is that the developer does not darken, one allowance developing completely. If the lights are increasing in density too rapidly you may sometimes advantageously wash the plate and commence developing again; but it rarely succeeds. It is very useful sometimes when sufficient density is obtained generally—except the sky, or foreground—to wash, and then confine the further development to those parts requiring it. In conclusion, I shall be most happy if, during our ensuing meetings out-of-doors, I may hear some member say—"I am trying your plan of working Fothergill's process, just tell me how long you would expose for this view?" I shall then think these observations have not been superfluous.

I will, at the risk of reiteration, state what are the characteristics of good materials and successful results. The albumen absolutely bright and clear; the sensitised collodion film creamy to look at, powdery to the touch; and the negative should, when developed, show considerable transparency in the sky—indeed a dense sky is not to be obtained in a properly-exposed plate unless very much over-developed. This, by the way, need give little trouble to anxious workers, as white skies are, I believe, out of date, and much found fault with by our friends the artist photographers.

Traces of clouds may be frequently observed in dry plates, and if not obliterated by over-development, add much charm and softness to the print specimens.

One word I would add as to the relative sensitiveness of wet plates and plates prepared by this method. I would say that they require from five to six times the length of exposure, never less; but there are many difficulties in the way of arriving at correct conclusions, as I have found that a collodion which is very sensitive when wet, is not correspondingly so when used dry.

PHOTOGRAPHY ON WOOD FOR ENGRAVING.

By. J. Contencin.

[Read at the Meeting of the South London Photographic Society, Feb. 21, 1861.]

A method, at the same time facile and practical in producing photographs upon wood for the purpose of wood engraving, has long been considered a desideratum, and has formed the subject of careful research both in this country and on the continent.

At first sight this problem may not appear very difficult to solve. It would seem, at a mere casual glance, that wood might be treated much in the same manner as paper, or that a collodion film might be used and the image developed upon it. But we must first consider the difficulties on the side of the photographic manipulator, and then the requirements of the engraver, and how they are to be met. Upon carefully considering these two points and their relation to each other, it will not be difficult to see why so many methods have been cast aside as impracticable.

When a solution of nitrate of silver is applied to the surface of the wood-block, that surface readily darkens upon exposure to day-light. So far well; but we find that it is not only the surface which the solution has affected, but that it has also penetrated deeply into the substance of the wood and softened it, thus making it far more difficult to cut.

The light substance of the wood, as seen in the cut lines, which is usually an indication of the extent of the engraver's work, is not in this case seen until the block is very deeply cut into.

But the most grave objection to which I have already alluded is the change to which the wood is subject. In the ordinary case it is crisp, and presents a certain amount of resistance to the graver. Of course the block which has received the photograph ought to be equal in this particular to the common ones; but it will be found that the silver salt and the soda used for fixing, by penetrating so deeply into the wood, have caused it to become in a manner soddened, very difficult to cut, and altogether objectionable.

The use of collodion has been to some extent successful: positives have been developed directly upon the block, the latter having first been coated with black varnish. I have seen a simple subject in process of cutting which had been prepared in this way, and succeeded very well.

Now, should this process answer as far as the preparation of the wood, and its substance being unaffected, which may be granted, yet its use must be limited; the wood-engaver must not be expected to perform the work of the draughtsman, or to produce brilliancy, effect, and pictorial excellence from a metallic and sombre-looking positive. He asks for a picture upon the block which shall have all the qualities of the engraving which he is expected to produce; and those who have seen the admirable works of our talented artists in this department will very well understand the engraver's objection.

If photography is to be used, it follows that the photograph on the wood should be equal to a drawing such as that which the engraver would expect from the hands of the artist. It must be upon the surface only, the substance of the wood not being affected. The preparation must not scale or chip during manipulation, and the surface must not be

affected by the light to which it must necessarily be exposed in the engraver's hands.

Having noticed briefly these methods, and the objections which are generally found to operate against their use, I shall now proceed to notice a process which I have not only been acquainted with for some time, but have used in practical work for several years.

The first thing which I found it necessary to guard against was the absorbent quality of the wood; and among the substances that appeared likely to correct this—such as gelatine, albumen, wax, aluminous soap, &c.—I did not find any superior to the varnish made with gum dammar and benzole. Spirit varnish can be used, as also amber and chloroform varnish; but the benzole varnish is sufficient.

The method which I have used is this:—The surface of the wood is flooded with varnish twice or thrice, until it ceases to absorb the liquid; but no coating is allowed on the surface, the object being simply to saturate the fibre. This being effected, the block is placed aside to dry. I next proceed to coat the face with a white preparation, corresponding to that commonly used for drawing. For this purpose I have used washed chalk or whiting; but I think zinc white answers the purpose better: it is applied with a flat camel's-hair brush, the excess being swept off.

When this is dry, the surface is again covered with varnish, and all not immediately absorbed is allowed to drain off, the wood being placed on edge. This last operation lowers the colour of the white coating; but it still remains sufficiently opaque to obscure the grain of the wood.

A solution of gelatine, containing twelve grains to the ounce of water, and twenty grains of chloride of sodium, is poured over the white preparation, and is allowed to drain off at the lower edge.

The block is rendered sensitive by being placed face down in a glass tray, containing a solution of nitrate of silver of seventy or eighty grains to the ounce, and kept carefully from contact by slips of glass: in this manner but a small quantity of sensitising material is needful, a large quantity, by being repeatedly used, might become deteriorated by the white.

It is, perhaps, needless for me to go into minute details, in regard to exposure, &c. I make use of the ordinary pressure-frame without the back, adjusting the block and negative in a way to allow their being removed and replaced if necessary. I have occasionally placed the negative upon the block without using pressure, adjusting it by three pins; and this has answered very well.

In connexion with the sensibility of the surface and vigour of the image, I must observe that the quantity of gelatine or other organic matter is of the greatest importance. If too small in quantity the image will not darken beyond a pale slate colour. In explanation, it must be recollected that the solutions being kept entirely upon the surface, and the silver not combining or acting upon the wood, but only with the gelatine, there must be a sufficient quantity of that material or of some other organic substance present; on the other hand, a large quantity would render the preparation too thick.

This is the method I have employed for producing photographs on wood blocks.

If performed in the manner I have just described, the coating, as regards thickness of substance, will be scarcely (if at all) perceptible. Under the graver it is much lighter in colour than the wood itself, but not white. The markings of the grain of the wood may be traced through it, and there is no tendency to scale or chip away.

After exposure the treatment of the image is throughout much the same as upon paper. It is fully toned in the gold bath, and fixed in rather weak hyposulphate of soda. The action of the latter must be carefully watched, and a short washing in running water is sufficient.

The negatives taken for this operation should be moderately dense—not of the very intense kind, but with sufficient gradation. When taking them the collodionised glass should be placed in the slide with the plain side toward the lens, otherwise the impressions from the block would be reversed.

In reference to recent claims for the successful application of photography to wood engraving, I may notice that the process I have used, and which I have just described (slightly modified sometimes according to the subjects), has been in operation since April, 1857.

I have rarely made inquiry about any works for which the blocks I prepared were intended, but I remember one upon the *Spirit Doctrine*, edited by William Howitt, and published by the Messrs. Routledge in 1857, containing eight engravings from blocks prepared by me. Also an edition of Longfellow's poems, by the same firm, with a frontispiece portrait. A few months' later I sent a frame containing three blocks—one of them a subject measuring eleven by nine inches—to the London Society's Exhibition of 1858. Perhaps some visitors may yet remember them.

It may be that this process, which I have used in the practical department of the art, will be found of service in other hands; and, as many are now giving their attention to the subject, I wish to contribute as far as I can to the general stock of information upon it.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Thursday evening, the 21st ult., at eight o'clock, at St. Peter's School Rooms, Walworth,—The Rev. F. F. Statham, the President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Meagher exhibited a folding copying camera, with a double-back for dry plates, 18 by 16 inches. Its range was 32 inches. With the copying cone attached, its extreme length was 60 inches. The camera was on the same principle as that by the same maker described in a former number of this Journal.

The Chairman called attention to a number of very beautiful *cartes de visite*, photographed by Mr. Lacy, of Ryde, Isle of Wight. Mr. Fry had promised to open the discussion upon Mr. Burr's paper read at the last meeting, but unfortunately he had not come. The adjourned discussion upon that paper would be opened by Mr. Burr himself, who had a few additional observations to make on the subject.

Mr. Burr was happy to be in a position to exhibit one of the original American daguerreotypes of the moon, taken in 1851 by Mr. Bond, with the large reflector, at the Cambridge Observatory, in that country. It showed the half moon with great beauty, and served further to illustrate his previous remarks.

Mr. Hughes said he had two similar ones that he had intended to bring that evening, but he had forgotten to do so.

Mr. Burr continued: With regard to the statement made by Mr. Fry in his paper, and repeated at the last meeting, as to the difficulty of taking lunar photographs with refractors being increased by an alleged variation in the relative distance of the visual and actinic *foci*, all he could say was that, if admitted, this proved the superiority of the reflecting telescope for celestial photography. The fact of the variation rested entirely upon that gentleman's assertion; but he had not tried whether the visual focus did not alter, and the actinic focus with it preserving the same distance instead of the latter only varying. There had been no decisive experiment on this point performed up to the present time to his knowledge. Mr. Fry, adopting Mr. De la Rue's suggestion, attributed such variation to the action of temperature on the length of the tube; but in that case the visual focus would be affected as much as the actinic, and he (Mr. Burr) had discovered no such variation on trying the visual focus of his telescope at the different degrees of temperature which had occurred since the last meeting. With the Moon and Jupiter no difference of focus resulted from the difference between 34° and 42°. An explanation of the variation—if any existed—had been suggested by Mr. Huggins, who attributed it to the effect of temperature, not upon the length of the tube, but upon the molecular condition of the glass of the lenses. That gentleman purchased a large object-glass, manufactured by Alvan Clarke, of Boston, U.S., from Mr. Dawes, one of our best practical astronomers, who informed him that the glass worked best in a certain temperature, clearly proving that it was sensibly affected by heat; and very likely the actinic rays might be affected by such a change in the glass more than others of less refrangibility. With reference to the statement of Mr. De la Rue, that the second reflector of his telescope did not absorb so much of the actinic power as he had anticipated from the loss of light, he must say that such a statement from so accurate an observer and cautious narrator must be received as a fact, and could not be affected by the observation of Mr. Hughes, that in using a mirror to reverse portraits for the daguerreotype process with a camera of short focal length, the light and actinism were lost in the same ratio. Here the conditions were not the same, the camera mirror had two reflecting surfaces, the glass and metal coating; but the telescope mirror was metal throughout, and the observations had not been made with a view to this point. Mr. De la Rue did not say no power was thus lost, but only that the proportion was different. Upon this subject he (Mr. Burr) wished to call their attention to a matter bearing upon the question, and that was the different power of luminous and non-luminous rays of heat to pass through transparent substances, such as glass and the atmosphere. The luminous rays of heat received from the sun passed easily through the atmosphere, and were absorbed by the earth during the day. At night the earth radiated dark or non-luminous rays of heat, which, not being able to pass through the atmosphere, were kept near the surface of the earth, and so preserved the animals and plants, whilst at a short distance from the surface the cold was intense. In the same way the luminous rays of heat passed during the day through the glass roof of a greenhouse, the floor, &c., of which then absorbed the heat. At night the dark rays were radiated, but were unable to pass through the glass, and so the heat inside was kept up. He called their attention to that fact, as there were also luminous actinic rays and non-luminous actinic rays, and it might well be that the former acted differently with reflecting surfaces to the latter. With regard to the question incidentally raised at the last meeting, whether the moon sends any heat to the earth, he might mention that Professor Piazzi Smythe, in the course of his experiments on the Peak of Teneriffe, in 1856, ascertained that some small amount of heat was thus reflected by the moon, thus confirming the experiments of Melloni on Vesuvius. The amount of heat which Professor Smythe found was received by the earth from the moon at his station, 8000 feet high, affected his extremely delicate thermo-electric pile about one-third as much as that emitted by a small candle placed at a distance of fifteen feet from his instrument; probably much more heat was reflected, but became lost in the upper regions of an atmosphere, as the cloud-dispelling power of the full moon had been long noticed.

Mr. Hughes remarked that, in relation to Mr. De la Rue's experience that he lost considerable light but very little actinism by reflection from the use of a second mirror, he (Mr. Hughes) could not avoid, on the

former occasion, noticing the difference between that and the daguerreotypist's experience, and must again repeat that it was well established that the use of the mirror did very seriously increase the time of exposure in the process alluded to. This was the main reason why the image on the silver plate was usually *reversed*. It was the advantage of these meetings that, when apparently contradictory facts were stated, they could be compared and inquired into, and the real truth often elicited. He had no doubt Mr. De la Rue was correct; but it was equally certain that the experience of all daguerreotypists also confirmed the statement he had made. As no two facts could, however, contradict each other, he did not doubt that, when the different nature of the two surfaces of the mirrors was considered, and also the different degrees of obliquity with which the cones of rays were received on the two reflecting surfaces, so far from these facts being in antagonism, they would each illustrate the other, and confirm the harmony always found in the laws of nature. As to the other point in discussion—the alleged variation in the relative distance of the visual and actinic foci—he thought the whole experience of photographers was against such a supposition, and that until all other sources of error were carefully eliminated, it would not be advisable to encourage that theory in explanation of effects which might with far greater probability be attributed to other causes.

Mr. G. Wharton Simpson said he had visited Greenwich Observatory last week, accompanied by Mr. Fry, and their attention had been particularly directed to the meteorological and magnetic departments, where they had an opportunity of inspecting in operation the beautiful processes so ably described by Mr. Burr at their last meeting. In regard to the explanation of the supposed loss of light or actinism by reflection, to which Mr. Hughes had referred, Mr. Glaisher had pointed out a peculiar illustration. He showed them that the light from the flame of napthalised gas twice reflected by prisms gave him, notwithstanding that double reflection, as forcible and speedy an image on the sensitive paper as that produced by the direct light from the flame itself, so that there could have been no sensible loss of actinism. Mr. Dallmeyer, to whom he mentioned the subject, had suggested in explanation that the loss of light by reflection by a prism was very inconsiderable when rays impinged directly at right angles upon the first surface, but that when they struck obliquely there was considerable loss; and where the obliquity of incidence amounted to seventy-five degrees there was a loss of about three hundred and seventy out of every thousand rays. He had made a note of one or two other things whilst he was at the Observatory, to which he would refer. In the first place it was a somewhat peculiar fact that the paper used for the meteorological and magnetic records was so prepared as to receive an instantaneous impression from an artificial ray of light. For such purposes it was necessary that the paper could be completely relied upon, as in case of any accident there would be the loss of one entire day's records. Mr. Glaisher informed him that his object had not been so much to obtain the greatest amount of sensitiveness as to get an uniform rate of sensitiveness continuing over the twenty-four hours. In his original experiments to ascertain the most suitable preparation for this purpose, he had to bear in mind a curious effect he found in calotype paper, namely, that the action of light continued progressing after exposure; so that a sheet exposed for three minutes in the morning when developed in the evening yielded as perfect a picture as one exposed for six minutes in the afternoon under exactly a similar light, but developed immediately—whilst that exposed in the morning had of course been exposed six hours or more before, during which time the action of the light at first set up had continued its influence sufficiently to render half the amount of exposure sufficient, and he had to guard against that increased action in preparing his paper, to retain uniform sensitiveness during twenty-four hours. The mode in which he prepared his paper, so as to obtain the maximum amount of sensibility and uniformity, was this:—First he applied a solution of iodide and bromide of potassium—eight grains of iodide to twelve of bromide, to an ounce of water—with a glass rod, and then sensitised with a fifty-grain nitrate of silver solution, also applied with a glass rod. He then placed it damp upon the cylinder, and kept up a certain amount of moisture by means of a piece of wet rag at the edge. No visible image was produced on the paper by the action of the light, but on development with gallic acid it gave a well-defined image. There was another point of great interest to photographers. It was a somewhat singular fact that the ordinary yellow, and even, as it appeared by daylight, dark orange flame of ordinary gas, should by any treatment be made to yield a light brilliantly white, possessing considerable actinic power. To produce this effect the gas was passed through what Mr. Glaisher called "the naptha box;" and during its passage it came into contact, and to a certain extent combined with, the vapour of naptha, by which this peculiarly pure and actinic character was communicated to the flame. There was just one other suggestion he would name, which might be worth the attention of gentlemen engaged in experiments as to the best method of preparing paper for producing enlarged developed prints. The fact that Mr. Glaisher's paper was sensitive to the instantaneous action of artificial light pointed out the suitability of a similarly prepared paper for developed prints, produced by the solar or other enlarging camera.

Mr. Burr said there was a very important connexion between the oscillations of the magnetic needle and the changes that were taking place on the surface of the sun—so much so, that the variations of the needle might almost be looked upon as telegraphic messages sent from the sun to the earth, giving intelligence of changes in the physical constitution of that luminary. It appeared that the maximum and minimum number of spots on the surface of the sun occurred within a space of ten or eleven years; thus in 1855 was the last minimum period, when for days scarcely any spots were visible, whilst in 1859 and 1860 there were very few days in which there were not a large number of them visible. This law had been found by Schwabe, of Dessau, during thirty-four years of observation; and very lately it had resulted from the reduction and discussion by General Sabine, of the Greenwich and Kow observations, as well as those from Hobarton, Toronto, and St. Helena, during the time they were supported by our government, that the period of the greatest frequency of magnetic storms, as the irregular variations of the needle were termed, coincided with the period of the maximum of spots on the sun. The magnetic needle had a regular variation or declination, lasting over a considerable period—going first east, and then west, of the true north. Upwards of 200 years ago it was east of north. In 1657 it agreed with the astronomical meridian, and then travelled west until the year '57. In that year it attained its maximum west of about 24°, and it was now approaching the true north, the variation being at the present time 21½ degrees west of the true north. That variation, however, was subject to very considerable fluctuations, called magnetic storms, taking place simultaneously all over the world, and those were clearly traced to be connected as to their frequency with the number of the sun's spots. They were not the effect of heat, as the earth's magnetism was strongest in our winter, when the sun was nearer to the earth, than in our summer. The earth's magnetism had once been supposed to be caused by thermo-electric currents; but in all probability it was really produced by the oxygen of the air, which was highly magnetic, being acted upon by the sun. With reference to the confirmation of Mr. De la Rue's statement of the small loss of actinism by a second reflection, which Mr. Simpson had heard from Mr. Glaisher, at Greenwich, and which it was said Mr. Dallmeyer had accounted for by reference to the obliquity of the rays falling on the mirror, he (Mr. Burr) must be allowed to observe that he thought Mr. De la Rue could not have apprehended the true point. It was not a question how many rays fell on the mirror, but what became of them afterwards, and why, while light was absorbed, chemical rays were reflected in a larger ratio. There was no dispersion in reflection, and therefore the two sorts of rays were incident and reflected at the same angle. The reason of the effect had yet to be sought out.

The Chairman said the application of their science to other sciences was almost sure to lead to fresh discoveries in each. In addition to napthalised gas, as an artificial light, possessing actinic power, he might mention that camphor put into oil would impart to it a certain amount of actinic power.

Mr. Burr said camphine was much better.

Votes of thanks were passed to Mr. G. W. Simpson, and again to Mr. Burr, for their remarks.

Mr. F. Howard read a paper *On the Fothergill Process* [see page 87], and produced various illustrative specimens.

A vote of thanks was then given to Mr. Howard for his paper.

The continuation of the report from the Experimental Committee was laid on the table, and taken as read. [See page 86.]

Mr. Clarke produced some negatives taken by the Fothergill process, with only twenty or thirty seconds' exposure, and stated that during last summer he, on one occasion, obtained an instantaneous negative by that process. The plate referred to was not washed before exposure, and he had obtained the same result with another plate whilst wet. He used a portrait combination.

Mr. Hughes said, with due deference to Mr. Clarke, he did not think that quickness of exposure was the standard by which a photograph should be judged. The real standard of excellence was its beauty. The great charm of Mr. Bedford's and Mr. Mudd's pictures consisted in the fact that they were exposed for such a time that every little detail was distinctly seen, even in the darkest parts.

Mr. G. W. Simpson said that under-exposure was a very frequent source of failure in dry-plate negatives, and mentioned the practice of several eminent photographers, as illustrative of the advantages gained by a lengthened exposure.

Short exposures were also denounced in remarks made by other members, after which

Mr. James Contencin read a paper *On Photography applied to Wood Engraving* [see page 88], during which he produced specimens of the prepared wood blocks. He added that the negative might be taken by artificial light, and transferred to the block in the course of an hour.

Mr. Blanchard inquired whether Mr. Contencin had ever tried soaking the block in turpentine for twenty-four hours, to prevent absorption. Turpentine was usually applied to wood blocks after they were engraved to harden them and to prevent them absorbing the printing ink. Blocks thus prepared became so tough that they would outlast half a dozen metal stereotypes taken from them.

Mr. Contencin said he thought the varnish better, because it only required half-an-hour to prepared the block, instead of twenty-four.

Mr. Hannaford said he had tried to transfer collodion films to wood blocks. He first of all coated the block with a solution of gelatine, containing Chinese white, and then laid it on a transparent positive film, which adhered to the block when dry. It was then pressed down smoothly, and it resembled closely a photograph taken on wood, and on running

a graver over it it seemed to present a surface suited for the engraver.

Mr. CONTENCIN said there was one great advantage in such a method, namely, that the surface of the wood would be unaffected.

Mr. HANNAFORD said in producing electrotypes he used gelatine with bichromate of potash, and on exposing to the light, under a negative, the portions acted upon by the light were rendered insoluble, while the other parts were soluble. He then put it into cold water, which had the effect of swelling, but not dissolving the insoluble portions of the gelatine, from which he took an electrotype. *Sometimes*, instead of swelling up, the gelatine was dissolved out, and a reverse electrotype was so obtained.

Mr. HOWARD said, even if a picture were taken from nature on wood, the engraver could not express by lines all the variety of tints in it.

Mr. CONTENCIN remarked that "tints" were now introduced by engravers. There might be some difficulty in engraving photographs on wood, but not more than a skilful engraver could overcome.

Mr. WALL said he had often drawn on wood for engraving with Indian ink. Surely if the engravers could reproduce the Indian ink tints, they could just as well reproduce the natural tints in a photograph.

Mr. SIMPSON remembered seeing, in 1854, an engraving on wood, photographed and engraved by Mr. Leighton. It was strange that since that time so little advance had been made in the art. Either there was greater difficulty than was imagined in producing a photograph on wood, or else there was great difficulty in engraving it when done. The real difficulty consisted, he believed, in finding an engraver capable of translating the various delicate tints into lines. He referred to the reproduction of the Gobelin tapestry, which an ordinary workman could not reproduce without the number of stitches of each colour being written down for his guidance. Mr. Bolton used a salt of silver in photographing on wood that did not require fixing, so that albumen gums, &c., were done away with in the process. It, however, required that the engraving should be conducted in a yellow, or at all events in a dim light.

Mr. WALL announced that Mr. Blanchard would read a paper at the next meeting *On Experiments on Intensifying Processes as Adjuncts to Instantaneous Photography.* Mr. Blanchard and Mr. S. Smith had presented two pictures to the portfolio.

A vote of thanks was passed to those gentlemen for their presents.

The following gentlemen were proposed, and declared duly elected members of the society:—Mr. Wm. Price, Mr. Burrows, Mr. James Contencin, and Mr. J. Baldwin.

The proceedings terminated with the usual vote of thanks to the President for his services in the chair.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Monday evening, the 18th ult., at eight o'clock, at the Golf Club House, Blackheath,—Charles Heisch, Esq., the President, in the chair.

The minutes of the last meeting were read and confirmed.

The CHAIRMAN said he had much pleasure in informing them that Mr. Negretti had kindly brought a number of views from Java and other countries, and had promised to give some interesting information concerning them. Before requesting him to do so, however, he (the Chairman) wished to make a few remarks *On the Toning of Positives.* [See page 81.]

Mr. NEGRETTI said he had found from experience that the alkaline gold-toning process could not be used in large printing establishments, for the hands of the person whom he employed in toning had broken out in postules and sores, solely on account of the action of the carbonate of soda and gold on the skin, and it would be years before they were entirely cured. Thinking that the eruption might be owing to other causes, he had employed another person, who suffered in a similar manner, and he found that Mr. Hayward (Frith and Hayward) had also experienced unpleasant effects from its use. Its ill effects were now so well known among his people, that if he asked them to tone a picture by the alkaline gold process, they would tell him he had better do it himself. It must, however, be recollected that, at times, upwards of 100 or 150 full sheets were toned daily in his establishment during the summer, and, therefore, no ill effects might be experienced by amateurs who only toned a few prints in the day. He was quite sure that the eruption on the hands of his toners was caused by the action of the chemicals, as they had been told, at the Hospital for the Cure of Cutaneous Diseases, that it was owing to the action of the carbonate of soda, in combination with the gold, upon the skin, and they were, he believed, subjected to arsenical treatment. The process certainly produced beautiful pictures; but he could not say exactly whether it was permanent or not; for some of Frith's last series of views in Egypt, toned by it, had faded, whilst the first series, toned by the old process, still retained their tone—the average washing being the same in both cases.

In reply to the Chairman,

Mr. NEGRETTI said it was an absurdity to say that prints taken on barium paper could not be toned by the alkaline process, as for six months his firm had toned prints on that paper. Less gold was required in toning when barium was used, as the latter gave a very beautiful effect of itself.

The CHAIRMAN said Mr. Negretti had been kind enough to bring down a number of beautiful transparent glass prints of views from various parts of the world for their inspection, and had offered to give any explanation of them in his power.

Mr. NEGRETTI produced a series of stereoscopic slides of *Views in Java*, from negatives taken by Mr. Woodbury, a photographer residing at Batavia, in that country, and printed on glass by Negretti and Zambra. In his opinion they were the first series that gave any idea of tropical scenery, and many of them were of great beauty—one, of *The Slave Girl*, especially so. The process by which they were printed on glass was, with a few modifications, identical with that he had described at a meeting of the London Photographic Society, about six years ago, and which was printed in the Society's Journal. The negatives were taken on collodion plates, and the prints were taken on the regular albumenised plates, as used by Fevrier and Soulier. Nothing was put into the albumen but iodides. All the prints were printed by superposition.

In answer to Mr. Glaisher,

Mr. NEGRETTI said that any person who stated that Soulier or Fevrier took large negatives and then reduced them in the camera did so purely from imagination, and he did not think a more mischievous statement could have been made, as it impressed amateurs who were producing good negatives, and who would eventually have produced good glass pictures, with the belief that there was some grand secret with which they were unacquainted, and so deterred them from proceeding with their labours. He had seen at least one thousand of Fevrier's negatives, all of which were on small stereoscopic plates. On one occasion he went to Paris for the purpose of treating with M. Clouzard, Soulier's former partner, for the purchase of various negatives. That gentleman showed him a great number, and among them was the celebrated *Bridge of Prague*, for which he (Mr. Negretti) offered a considerable sum. Soulier and Fevrier, however, brought an action against Clouzard, under the deed of dissolution of partnership, whereby he engaged not to carry on the business of a photographer, and so the sale was put a stop to. All the negatives he saw upon that occasion were on small plates, and he considered *that* sufficient evidence of the fact that Soulier and Fevrier did not reduce them. Soulier and Fevrier printed by superposition, and not in the camera. In answer to Mr. Glaisher, he said he did not believe that Soulier and Fevrier used artificial light for printing. That was another idea started which had a tendency to frighten amateurs. In London, with its ever-varying light, nearly two-thirds of his prints were lost from under or over exposure—for in glass printing it is a question of *seconds* only—whilst, in Paris, with its clear, steady light, prints could be obtained from an early hour in the morning to four o'clock in the afternoon, without hardly varying the exposure—so that artificial light was only imagination. He considered the pictures taken from negatives on albumen plates to be the best and sharpest of any, for the simple reason that they did not require varnishing, and therefore there was nothing between the negative and the print. He had some negatives that were taken on collodion plates which had received three coats of varnish, and yet he never could take a print from them without making holes in the negative. It was necessary, in printing by superposition, in order to obtain good, sharp impressions, to press the two glasses in a pressure-frame; and, when albumen prints were taken from collodion negatives, the albumen was so much harder that it injured the collodion film even when varnished. Soulier and Fevrier, who used albumen for their negatives, did not use varnish at all, the films being so hard that it required a knife to scrape them off the glass. Sometimes, however, those gentlemen modified the albumen by mixing with it a little collodion; but pure albumen was decidedly the best for wearing and sharpness. When Soulier's negatives were injured by use, he repaired the positives by re-touching them with Indian ink. On a close examination of his slides, sometimes as many as two hundred patches might be discovered—although it must be acknowledged that the painting was most beautifully done. He had seen nearly a whole tree in the foreground put in in a most exquisite manner. Their surprise at this would be less when they recollected that both Soulier and Clouzard were formerly well-known as artists on glass. In one of their pictures called *The Bath-room in the Alhambra*, the plank on the left hand was a glaring white originally, but it was carefully shaded down in the print. When any part was too black they applied a sort of mordant, which rendered the object transparent. Patching the prints was absolutely necessary sometimes, for a little speck of dust on the negative would leave a white spot that if not hidden would entirely spoil the general effect. He made no secret of his process, because it would be impossible to expect secresy among a number of workmen necessarily employed. He (Mr. Negretti) produced some negatives on albumen taken last year at Rome by one of their young men. These negatives had never been varnished, and they were still perfect, although at least four hundred glass impressions had been taken from each negative. When they wanted cleaning he put them under the tap and washed them. In reply to Mr. Glaisher, Mr. Negretti said English lenses were mostly better than the French, and English photographers did not spare expense, either in apparatus or chemicals, nor could it be asserted they were less intelligent than the French. If he could only induce English amateurs to try albumen for negatives, he was sure the would be able to beat the French completely, and, in fact, to "shut them up," as far as glass printing was concerned.

In reply to a question put by Mr. Glaisher,

Mr. NEGRETTI said the operation certainly was more troublesome where albumen was used, and having *to wait until* NIGHT to develop the negative was a great objection, which accounted for their operators in China,

Japan, and India not often taking negatives by that process—a circumstance he greatly regretted.

The Chairman inquired the time required for exposure in the camera when albumen was used?

Mr. Negretti replied that in an English light three minutes' exposure was necessary in summer, whereas in Italy only one minute and a-half would be required. The lens used was the ordinary single lens of 4½-inch focus. In answer to Mr. Glaisher, he said his firm was the only one in England that produced albumen pictures commercially. He supposed that others were frightened by the supposed difficulties, generally asserted to be insurmountable, but which, he said, did not exist. The positives after development were toned with a little gold. When iron was used as a developer for collodion negatives, varnish could never be put on clean enough for glass printing, and spots on the print were the result.

The Chairman asked whether there was any reason why they should not varnish with a thin film of albumen over collodion?

Mr. Negretti said he had tried that method, and found it could not be used for negatives for printing on glass, although it might do well enough for paper printing. He had even tried pouring the albumen on whilst the negative was still wet, but it would not do at all. He was very anxious that English photographers should adopt the albumen process, as with the exception of Soulier and Fevrier's views, and a few large pictures by Bisson and Martens—which, by-the-bye, are from albumen and collodio-albumen negatives—he had never seen any French pictures to be compared with those of Bedford, Wilson, Fenton, and a host of other English photographers. The French also were very slow in working, as during the four months Soulier was in England last year, taking the royal palaces, he only took about 250 negatives—good, bad, and indifferent—while Mr. Frith would have taken double the number in as many weeks. In answer to Mr. Wire, Mr. Negretti said he knew the albumen process was not so quick as the Taupenôt process. There was one secret about Soulier's process that had never been hinted at, and the only one, namely, that he took his negatives on the back instead of the front of the glass, focussing through the ground glass; for, in the manner he mounts the pictures, they would be reversed if he did otherwise. In answer to the Chairman, he said the albumen plate would only keep three or four days if sensitised—that is, to get first-rate negatives; but if not sensitised, they would keep for years. Whenever they had plates that had been long sensitised, the negative developed *foggy:* in that case they are put under the tap and well washed, when the development is resumed; but the negatives are never so bright and sharp as when recently sensitised. They always washed their plates well with rain water after sensitising. He then proceeded to explain in detail the slides from Java, and stated, as a curious fact, that having sent to the representative of his firm in Japan some stereoscopes, as presents to the European officers, the natives immediately imitated them in lacquer work, and their operator was presented with some within a week after the arrival of the English ones. He ordered a large quantity of them, and sent them home. There were now upwards of 200 in the London Docks.

A vote of thanks was given to Mr. Negretti for his kind communication.

The proceedings terminated with a vote of thanks to the Chairman.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The ordinary monthly meeting of this Society was held in George Street Hall, on the evening of Tuesday, the 12th ult. The chair was occupied by Sir David Brewster, President of the Society.

The minutes of last meeting having been read,

Mr. Robert Armstrong was admitted a member of the Society, after which the Chairman read a paper *On Photographic and Stereoscopic Portraiture.* [See page 87.] Sir David's address was listened to with marked attention.

Mr. Horatio Ross said he was sure it must have given them all pleasure to have listened to the able paper just read by their President. The subject was one of the most important to which the attention of the photographer had been directed. Everything which Sir David Brewster stated in connexion with optics they must all accept as facts; but as practical photographers they knew the extreme difficulty which they experienced (with their present knowledge of chemistry) in using lenses with very small apertures: the time occupied in taking a picture with them was so great that no human being could reasonably be expected to remain in a state of absolute repose for such a time as would allow of getting a tolerably correct picture. He feared that the advantages to be gained in portraiture by using such small lenses would be more than counterbalanced by the difficulty of getting a person to sit for some minutes without moving.

Sir David Brewster, in reply, stated that the time required for taking a portrait by one of these small lenses was not so great as Mr. Ross supposed. He himself had more than once had his portrait taken with a small lens: the time of sitting on one occasion was sixty seconds, and on another fifty seconds.

Mr. Walker attested to the excellence of the portraits now alluded to, which he had seen.

Mr. Tunny said that from several experiments he was more and more convinced of the soundness of Sir David's theory. In order to produce the best results, he used a small stop between the lenses of his portrait combination.

Sir David Brewster said there would be no practical difficulty were photographers only to try it.

Horatio Ross, Esq., then proceeded to the

Award of the Prizes for the Best Pictures in the Exhibition.

The Council of the Society having a second time done me the honour of requesting me to award the medals for the best portrait and landscape in the Exhibition, I felt that they could not pass on me a higher compliment; but I cannot say the duty was a pleasant one, for although it was in my power to confer happiness upon two individuals, yet there were many who, doubtless, would feel disappointed, as it is one of the consequences of our art that every one thinks his own pictures the best. I myself have often, after having produced a good picture, said—"Well, there is nothing which can beat that;" but on seeing the same picture hanging among others in the Exhibition I have, by comparison with them, observed deficiencies, and have gone away with the determination of producing something still better. Now, I believe this is a general feeling among all photographers. If we were to be disheartened because our pictures were not equal to others, it is evident that progress would never be made.

In this Exhibition there are a number of really good pictures, and many exhibitors may fairly think themselves entitled to gain the medal, which is the only public honour a photographer can gain. I believe other societies give medals, but they are limited to the competition of the members: our medals are open to the whole world, and I hope they will always continue to be so.

Having accepted the office of judge, I have done my best to discharge the duty properly, and have spared neither time nor trouble in making myself acquainted with the pictures. I began with landscapes, and had great difficulty in coming to a decision, for we have in this Exhibition a vast number of most excellent landscapes. After going over them repeatedly, both by gaslight and daylight, I found pictures by Maxwell Lyte, Fenton, Mudd, Annan, Dixon Piper, and another gentleman who makes his appearance in our Exhibition for the first time, Mr. Vernon Heath. These pictures were so nearly balanced in merit, that it was really a toss up to say which was best. I consulted some friends with a view to learn which picture was, in their estimation, the best, determined to pay every deference to such opinions; but although they were all agreed that the artists I have named had sent the best landscapes, they differed as to which was the best picture. I had, therefore, to be guided exclusively by my own judgment in the matter, and I have accordingly fixed upon No. 106, *A View in the Pyrenees,* by Mr. Maxwell Lyte, as the landscape entitled to the medal. I beg to remind you, gentlemen, that he has been a large contributor to our Exhibition for the last three years, and it was a matter of great doubt whether or not he was to get the medal both last year and the year before. If instead of awarding the medal to the best picture, it was to the person who had sent in the best lot of pictures, he would have got it every year.

With regard to the medal awarded for the best portrait, there was again for that a very keen competition. We have admirable portraits from Tunny, Moffat, and Orange; still, on looking them all over very carefully, I thought that the portraits sent by Claudet were, on the whole, better. Here again I experienced some difficulty in determining to which of his pictures the prize should be awarded, but have now fixed on No. 67, a *Portrait of A Lady.*

No Scottish artist has as yet gained the medal, but that is a proof we are very impartial in our awards. I know that there will be no feeling of jealousy against M. Claudet, for he is at once the oldest of photographers, and we are indebted to him for a great many improvements in photography, especially in daguerreotyping. One thing I venture to point out to all who are in the habit of taking portraits, and I am sure M. Claudet will not find fault with me for betraying some of the secrets of his studio. If you look at his portraits you will find that he preserves the purity of his whites in a very remarkable manner. Look, for instance, at his *Portrait of a Lady,* with a black velvet jacket, and a considerable deal of white muslin about her dress, and you see how perfectly he has rendered this difficult subject, both in its highest lights and deepest shades. To do this he makes use of two large screens, and all the time the process is going on he is shading those parts of the sitter which are apt to develop too quickly. By these means he is enabled to produce such beautiful contrasts in his pictures. I feel confident that all photographers will agree with me that M. Claudet has well earned the "blue ribbon" of our order.

Before I conclude I wish to direct attention to a very remarkable picture in the exhibition, a most beautiful specimen of what is a new and novel way of applying photography. Mr. Rejlander was the first to adopt the plan of producing pictures from three or four negatives, and of this class is the picture to which I allude. It is by Mr. Robinson, the winner of last year's medal, and is entitled *A Holiday in the Woods.* I had only two medals to award; to Mr. Lyte I gave one, and to M. Claudet I gave the other; but I take the liberty of directing the attention of the Council to that picture of Mr. Robinson's, and think it is well worth the consideration of the Council whether they should not award to him a bronze medal as a mark of their approbation. In skilful hands this method of printing may be the means of producing admirable results.

Mr. Ross's address was received with great applause, and his decision appeared to give general satisfaction.

The PRESIDENT conveyed to Mr. Ross the thanks of the Society for his kindness in again acceding to the request of the Council, and acting as judge in the Exhibition.

The SECRETARY then read a paper by M. Claudet, *On the Laws which Regulate the Conjugate Foci, and the Sizes and Proportions of Images according to the Distance of Objects.*

M. CLAUDET, in his paper (which was of very great length, and illustrated by several diagrams), spoke of the importance of photographers being able to determine exactly the distance the sensitive plate should be from the lens in relation to the distance of the object to be copied, and the subsequent degree of enlargement or reduction of the image. With a view to effect this, he advised a scale to be affixed to each camera, so that it could be drawn out any given length with exactness—the zero of the scale to be the solar focus of the lens, or its focus for parallel rays. The camera being so prepared, the photographer could, by means of a table of distances between the object and lens, and the lens and plane of reproduction, be able without any calculation or trouble to determine the relation his copy should bear towards the object to be copied. As such a table would be of great service, it was his intention to compute one as soon as possible.

The thanks of the meeting were given to M. Claudet for his paper.

The next subject before the Society was a communication from Mr. C. J. Burnett, entitled *Notes on Various Matters connected with Photography.*

Among the subjects treated of by Mr. Burnett were *A Modification of an Engraving Process* published sometime ago by him; *The Use of the Metal Aluminium for Mounting Lenses, instead of Brass, for the Construction of Metal Cameras with Gutta-percha Slides, or Slides made with India-rubber mixed with Vegetable Fibre; and also for the Mounting of Telescopes.* There appeared to be no objection to the use of aluminium from its price. Its softness was an objection, but the admixture of a small quantity of copper or brass with it would cure that fault. The third topic treated of by Mr. Burnett was *The Production of Positive Photographs with a White Margin for Book Illustrations, with the Best Means for Obtaining this End.* He suggested that the negative should be taken on a plate of glass as much larger than the picture they intended to take as the blank margin they wished to have in addition would require. It was then to be considered how this marginal space could be made black, so as to produce corresponding whites in the positive. One way was by painting it over with lamp-black or other black varnish. Or they might use in the camera a glass which had been stained black or red; but this plan he would not recommend.

After the usual votes of thanks, the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

A NEW Society, bearing the above title, was formed in Edinburgh on the evening of Wednesday, the 20th ultimo. In the unavoidable absence of J. D. Marwick, Esq., City Clerk, the chair was occupied by George H. Slight, Esq., F.R.S.S.A., who in a few remarks explained the objects of the Society. All present were aware, he said, that there was already a Photographic Society in this city, the annual Exhibition of which, now open, was well calculated to improve the taste for the art both among its members and the public; but, while that Society had its peculiar advantages and departments for its members, it had been thought that there was room for another Society, if it could be made more easily accessible to the amateur of moderate means, in which more freedom of discussion could be cultivated, and, having more frequent meetings of an experimental character, would prove more useful to the young photographer. A new Society, conducted on such principles, could scarcely be called a rival to the present one, but would rather be looked upon as a useful assistant, taking upon itself no end of drudgery, by discussing subjects which might be considered as beneath the notice of the other—aiming at plain practical excellence, although, in doing so, not necessarily abjuring the refinements of the art, which they would share in common with their more matured parent and friend. The projectors of this Society had for several months been in the habit of meeting together and discussing photographic matters in that way, and the pleasure and instruction they had derived induced them to wish to extend their plan a little further, the present meeting being the consequence.

A list of laws for the new Society was then submitted to the meeting, which, after slight alterations, were unanimously approved of.

On the motion of ANDREW MURE, Esq., Advocate, the following gentlemen were elected a Council of Management:—

President—J. D. MARWICK, Esq.
Vice-President—G. H. SLIGHT, Esq.
Secretary—Mr. J. T. TAYLOR, 81, South Bridge.
Committee—

Mr. ROBERT S. GALLOWAY.	Mr. W. H. DAVIES.
Mr. ARCHIBALD BURNS.	Mr. JAMES RAMAGE.

It was agreed on that meetings be held fortnightly throughout the year, that summer excursions be planned, and that, if it were found possible from the state of the funds, a glass house be procured, in which the members might practise portraiture.

Mr. VALENTINE, of Dundee, who was present, gave an interesting account of the introduction of the collodion process into that part of Scotland in which he resided, stating that he was the first to manufacture collodion for photographic purposes in that quarter.

Several useful suggestions for carrying out the objects of the Society were made by Messrs. Campbell, Flowers (Warriston House), and others; and after a number of names had been enrolled, and a vote of thanks tendered to the Chairman, the meeting separated.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

AN adjourned meeting of this Society was held on Thursday evening, the 14th ult.,—Mr. J. Stuart, one of the Vice-Presidents, in the chair.

The Secretary read the subjoined letter from A. Claudet, Esq., in reply to the intimation of his having been elected an honorary member of the Society:—

London, 9th Feb., 1861.

DEAR SIR,—It is with a deep feeling of gratitude that I accept the high distinction of honorary member conferred on me by the "City of Glasgow and West of Scotland Photographic Society."

I assure you I am exceedingly flattered that my endeavours to promote the progress of our beautiful art have been noticed by the Society, and that my labours have been appreciated by so competent a body.

Nothing could be more gratifying to me than to become associated with honorable fellow-labourers whose aim is the welfare and improvement of photography; and I hope that by so many united efforts the art will fulfil its high destiny.—I am, dear Sir, your very obedient, humble Servant, A. CLAUDET.

John Cramb, Esq., Hon. Sec., "City of Glasgow and West of Scotland Photographic Society."

The Secretary was ordered to engross M. Claudet's letter in the minutes.

Mr. James Cramb's paper—*Notes on the Hyposulphites of Silver*—was then read. [See page 82.]

Mr. Cramb illustrated his remarks by the performance of the experiments referred to in his paper. The members present seemed highly interested, and testified their approbation in the usual manner. The discussion on the question was adjourned to next meeting.

Mr. Stuart then left the chair for the purpose of joining in the discussion on the hydrometer silver meter question, adjourned from last meeting. Mr. Duncan Brown occupied the chair during the rest of the evening.

Mr. STUART reported the results of some experiments made by himself and Messrs. Kibble and Macnab on one occasion, and by himself and Messrs. Macnab and Bowman on another occasion. He (Mr. Stuart) said they had not adopted the plan pointed out by Mr. Cramb of testing the bath, but had taken the true chemical plan of converting the whole of the silver in the baths into the chloride; and to prove the perfection of their analysis they had also made some nitrate from known pure silver. His own bath, they found by their plan of testing, contained 88 grains of nitrate; Mr. M'Farlane's 92½ grains of nitrate; Mr. Macnab's 36¾ grains of nitrate to the ounce. The argentometer obtained from Mr. Spencer, at 60° temperature in a standard solution known to contain 47½ grains to the ounce, stood at 44, or 3½ grains to the ounce of error. In a 30-grain standard solution it was quite correct. This meter indicated 92 grains in Mr. Stuart's bath, and 99 in Mr. M'Farlane's. He (Mr. Stuart) said he mentioned the bare facts—they could draw their own conclusions. On the question of temperature he had to report as follows:—The argentometer showed a variation of 1½ grains to the ounce for *ten* degrees of rise of temperature from 60° to 70°, and from 70° to 80°.

Mr. JOHN CRAMB said he would, with the leave of the meeting, attempt to show how much Mr. Stuart's facts proved in this question. He would first correct an error Mr. Stuart had evidently fallen into. The plan of analysis pursued by Mr. Stuart and his friends had been pointed out in his (Mr. Cramb's) paper read at the previous meeting, and the phrase, "true chemical plan," seemed to him simply absurd—as it was quite as consistent with the principles of chemistry to estimate the amount of silver in a solution by the amount of chloride required to precipitate all the silver, as to weigh the amount of chloride precipitated, and so judge of the quantity of nitrate of silver contained in the solution tested. The objection to the latter plan was pointed out at the last meeting—its impracticability for photographers in their daily practice. He would beg the members to observe that the results obtained by Mr. Stuart and his friends were thus far confirmatory of the results laid before the Society at the last meeting—that in all Mr. Stuart's trials the result was higher, and in a pretty constant ratio, which would lead him to suspect some constant source of error, either in the instruments employed or in the manner of using them. He (Mr. Cramb) at this point insisted on the injudiciousness of citing Mr. Kibble as a guarantee that all had been correctly done. Mr. Kibble was not present, and he, for himself, would not care to animadvert on the statements of a gentleman which they only had at second-hand.

Mr. Cramb was proceeding to comment on the statements of Mr. Stuart on the effect of temperature made at the last meeting and in his present report, when Mr. Stuart denied the accuracy of the report, attributing to him to have said that a difference of *one grain* of silver of error to each *degree* of temperature above or below 60° would be indicated by the argentometer.

Mr. CRAMB, as Secretary, appealed to the meeting whether he had not given a correct report, and it was unanimously declared to be correct.

Mr. STUART had not said that it was a grain to the ounce.

Mr. CRAMB said Mr. Stuart was on the horns of a dilemma: his choice was the longest and the sharpest horn.

Mr. JAMES CRAMB, pointing to the argentometer said to have been

used, remarked that it was impossible to measure half-grains by such an instrument; and, as it had been confessed to be inaccurately divided, he was astonished that gentlemen would use such an instrument in any careful investigation. He simply wished to say further that the grain and a-half per ten degrees of additional temperature, though far below Mr. Stuart's former estimate, was yet much in advance of truth; but in such a matter he would rather show the Society the result than tell them of what he had obtained by himself.

Mr. John Cramb said the results given by Mr. Stuart on the specific gravity question were utterly valueless: he (Mr. Stuart) had not tried the bath, except by a hydrometer which he himself had said was erroneously graduated. Why not take the specific gravity bottle, as his (Mr. Cramb's) brother had done?

Mr. Macnab referred to the fact that they made their nitrate from pure metallic silver.

Mr. Jas. Cramb asked how much solution was operated on from each bath?

Mr. Stuart said one ounce of each.

Mr. James Cramb asked what kind of measure they used in measuring the quantity?

Mr. Stuart held up a common conical two-ounce measure.

Mr. James Cramb said it was unwise to talk of careful analysis and use such a measure, where, from the extent of surface, error would be so imminent. He considered the whole affair as unreliable, and totally unworthy of any one making pretension to scientific accuracy. Analytical chemists used an accurately graduated measuring bottle, which he described.

Mr. John Cramb said he thought it would have been courteous if he or his brother had been invited to be present at the re-testing of baths which they had tested; but as the gentlemen who had reported the results that evening had not thought so, and as the subject seemed by their statements not so satisfactorily settled as it could be, he would propose that the Society appoint a small committee to investigate fully the whole question. He still thought it a very small matter, and unworthy of the whole Society spending an entire night upon it again; but a report by a committee would not take up much of the Society's time.

Mr. Ewing said he thought that the subject had been sufficiently discussed, and he would move that it be now dropped.

Mr. A. Robertson seconded Mr. Ewing's motion.

Mr. Cramb's motion for a committee failed for want of a seconder.

A short discussion followed on the graduating of dropping tubes, &c.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held at the Chorlton Town Hall, on Wednesday, the 13th ult.,—Mr. W. Griffiths, Vice-President, in the chair.

After the minutes of the last meeting had been read and confirmed, the Chairman said that, as there was no paper to be read, he would take the liberty of calling upon Mr. Wardley to favour the members by giving them his opinion as to what he believed to be the best method of producing transparent positives, either for the lantern or the stereoscope.

Mr. Wardley said, that as far as his experience went it was decidedly in favour of taking them by contact on dry plates with artificial light. He had heard a good deal said about producing them through the camera on wet collodion, but he had invariably found that pictures so taken were wanting in that sharpness and definition which printing by contact on dry plates always gave. Any of the numerous dry processes might be used; but, after considerable experience in nearly all of them, he gave the preference to the raspberry syrup, not so much from the simplicity of the manipulation required, but because the tones produced by it were agreeable and pleasing when viewed in the stereoscope, and also because the beautiful softness and semi-transparency of the shadows which it gave made it particularly well adapted for pictures intended to be used in the lantern.

A Member asked if there were not many drawbacks to the successful working of the process?

Mr. Wardley replied that there were certainly the usual difficulties attending all dry processes to be overcome, but they were not such as might not be easily got over by careful manipulation. The principal and only important ones were the liability of the sensitive film to become attached to the negative while in the pressure frame, in consequence of the adhesive nature of the preservative coating, and the next was the tendency sometimes in the collodion to split up or leave the glass during the development or the subsequent fixing. The first might be readily avoided by well drying the sensitive plate before putting it in the printing frame; and the second could generally be overcome, if not entirely obviated, by coating the plate, either wholly or partially, with albumen or gelatine, previous to the application of the collodion.

The Chairman said that he had often been surprised to see albumen recommended in the Journals for the purpose just stated. He thought that such a use of it must inevitably lead to a discolouration of the bath, but would be glad to have the opinions of those who had practised it for some considerable time.

Mr. Hooper said that opinions differed greatly upon this subject, and he should be glad to see it definitely settled. From the slight experience he had had of it, he was inclined to the view that no deterioration of the bath took place.

Mr. Wardley said he was sorry to have to remark that this subject could not have given rise to any doubts if photographers generally were only animated with a better spirit of candour towards each other: it was impossible to use albumen in the manner stated, or even to the extent of a quarter of an inch all round the edge of the plate, without the sensitive bath becoming after a time discoloured and unfit for ordinary wet negative pictures. The coating with gelatine was not liable to the same objections, but greater care was necessary in their preparation, particularly as respects keeping them free from dust and damp.

The Chairman said he did not altogether agree with Mr. Wardley, that the best mode of taking transparencies was by contact, and not through the camera; he believed that, by proper arrangement of lenses and stops, the latter method would be found to present fewer difficulties, with results equally satisfactory as respects sharpness and good definition.

A lengthened discussion then took place on the toning of positive prints by the alkaline chloride of gold.

In answer to a question from the Chairman,

Mr. Wardley said he should hesitate before giving a decided opinion upon the absolute permanency of prints toned by the alkaline chloride; still he thought from the short time it had been practised, and the general results obtained, that it promised to be greatly superior to the old method. He had, it was true, detected slight evidences of a change in some prints toned by it, but he was strongly of opinion that it was in consequence of their having remained longer in the hypo. than was necessary to dissolve out the chloride of silver, in which case he thought the decomposition of the double hyposulphite of soda and silver had partially commenced. He believed that, if prints after receiving a fair amount of gold from the alkaline chloride, were not allowed to remain in the hypo. too long, no fears need be entertained as to their permanence.

Mr. Hooper said the permanence of a print could be judged of almost to a certainty from its colour. If that were of a deep dead black, the chances were that it would fade; but if of dark brown, inclining to bistre, he should not hesitate to award it a much longer existence. This latter tone was, to his mind, much more pleasing and agreeable than the former, and he thought the public would soon come round to the same opinion.

Mr. Wardley and other members said they could entirely endorse the views just expressed.

A Member inquired if any means were known by which the spontaneous colouration of long-kept sensitive papers could be removed.

Mr. Wardley said he had tried several plans, but the most effective was this:—After taking the print from the frame he immersed it in an aqueous solution of iodide of potassium, which speedily removed all superfluous colour without materially affecting the picture; but he must tell them that he had not as yet been able to tone by the ordinary methods a print so treated.

A Member suggested the use of chlorine or chlorinated water as likely to answer better than iodide of potassium for removing the colour.

Mr. Adin did not see how so deleterious a substance could be practically employed, even supposing it to be well adapted to the object in view.

The Chairman then made some observations on uranium printing. He said he should like to see some of the members take up the subject, as, from the permanency as well as the occasional beauty of its results, he thought a great deal more might be made of it than had been hitherto done. He then exhibited some prints taken by him soon after the process was made public, all of which he said remained as perfect in tone as when produced. One on albuminised paper was considered to be nearly, if not quite equal, to an ordinary silver print.

Mr. Whaite said he thought the process might be employed with great advantage in the production of large portraits intended for painting up.

After some further discussion, the Chairman announced the conclusion of the ordinary business, and that the meeting would then be made special for taking into consideration the report of the Treasurer and other matters relating to the election of officers for the ensuing year.

A vote of thanks was then passed to the Chairman, and the business of the ordinary meeting concluded.

FRENCH PHOTOGRAPHIC SOCIETY.

The following subjects were brought before the last meetings of this Society, which we quote from *Le Bulletin*:—

Four Thousand Positive Proofs per hour.—Mr. Harrison presented to the Society the following communication upon the Telesmatic Machine, made in America, by M. Fontayne, by which four thousand positive positives can be obtained in an hour with a single negative, and exhibited a proof produced by the same. He stated that common letter paper is prepared by a method, so that it is rendered very sensitive; it is then dried and fixed upon a cylinder, which is placed in a dark box, having on the outside an arrangement by which the cylinder can be rotated. Upon the top of this box there is an aperture through which the light passes; into this the negative is fixed, and the paper is made to touch and leave it after each revolution of the cylinder, in the same manner as in a printing machine. Above the aperture and the negative is fixed a powerful condensing lens, so that a very intense beam of solar light may be projected through the negative upon the sensitised paper placed beneath it. The aperture is closed by a shutter arranged in such a manner that it can be opened and shut instantaneously, and simultaneously with each rotation of the cylinder. By this means the negative can be exposed hundreds

f times per minute, and thus six thousand proofs may be obtained
n an hour. The proofs are produced by development printing.

The same machine may be made to contain ten small negatives, all of
hich may be exposed at the same time.

M. Fontayne has made a new instrument, by means of which a
housand proofs can be exposed per minute; and its capability has been
ested by the largest order for photographic proofs ever given. This
rder was for no fewer than ten thousand portraits of Mr. Lincoln, and
en thousand of Mr. Hamlin, when they offered themselves as candidates
or the office of President of the Republic of the United States. Two
undred and fifty of these portraits were photographed upon a single
heet of paper.

Mr. Radcock, in a Memoir which he read before the American Photo-
raphic Society, said he had seen that machine in operation, and that
wo hundred proofs could be impressed in a minute.

Promised Novelty.—M. Gérin de Valdonne announced that he has
ist discovered a process destined, in his opinion, to produce a consider-
ble modification in the photographic process now in use. He could not
hen describe his method, which he wished to bring to perfection before
aking it public. According to his statement positive proofs could be
roduced directly in the camera, and without nitrate of silver, in which
he blacks and whites would be unexceptionable.

Duc de Luyne's Prize.—The competition for the great prize of 8000
ancs, founded by the Duc de Luynes, has for its object the conversion
f photographs into matrices, from which a great number of impressions
an be produced, in a manner similar to the processes on metal and stone,
ithout the intervention of the human hand in the production of the
esign.

The Commission appointed by the French Photographic Society to
ward this prize, has, after a careful examination of the productions sent
n by the competitors, adopted the following conclusions:—

"The Commission acknowledges the importance and interest of the
roductions presented by many of the competitors, particularly those of
lessrs. Poitevin, Charles Nègre, and Pretsch. These works encourage
he hope of a satisfactory solution to the question; but considering
hat the results hitherto obtained are not sufficiently complete, and also
hat the authors themselves have not had sufficient time to give to their
rocesses the greatest amount of perfection of which they are suscep-
ible, the Commission decides not to award the prize for the present, and
hat the competition be postponed till the 1st of April, 1864."

Photozincography.—M. Davanne presented to the Society the follow-
ng observations upon the analogies which exist between the processes
f M. Poiteven and Colonel James:—

In noticing the description in the various photographic Journals of the
rocess of Colonel Sir Henry James for obtaining a transfer of a proof
pon zinc, he had been surprised that not one seemed to recollect that, in
anuary, 1856, M. Poitevin communicated to the Society a process based
pon the same reactions, and by means of which he obtained various
eproductions, printed with lithographic ink.

It follows, from an attentive perusal of both processes, that, if they are
ot identical, they have at least the greatest analogy.

In both processes it is necessary to prepare a sensitive surface by means
f a mixture of gum, water, and bichromate of potash; after having ex-
osed it to the light, some oily ink, previously diluted, is passed over it.
his ink adheres only to the parts acted upon by the light; the excess
s in both processes removed by washing.

M. Poitevin obtained his proof either upon paper or directly upon a
ithographic stone. Colonel Sir Henry James begins by obtaining the
roof upon paper, and transfers it to a plate of zinc, afterwards to be
reated by the zincographic processes.

If the process of Colonel James rest exclusively upon the manner of
ransferring the proof upon zinc, and afterwards employing this zinc
late, we are right in saying that he has simply applied the process of
I. Poitevin to zincography; but if, in speaking of Colonel Sir Henry
ames's process, we were to understand that the only necessary operation
vas to obtain a proof in a greasy ink, susceptible of being transferred to
tone or zinc, we believe that the honour of the discovery ought to be
ccorded to M. Poitevin.

AMERICAN PHOTOGRAPHICAL SOCIETY.

The following extract from a report of the twenty-fourth meeting
f the above-named Society is taken from the pages of our con-
emporary, the *American Journal of Photography:*—

HARRISON'S NEW LENS.

Mr. Rutherford said: Mr. C. C. Harrison has for a considerable
ime been engaged in perfecting a lens which appears to be a novelty
n construction and its properties. He has already completed three
grades: first, for stereo. views, with focal length of two and a-half
nches and a *flat field* five inches in diameter; second, view lens five
nd a-half inches focal length and field ten inches in diameter;
hird, a twelve inch focus and a field of twenty-four inches. Thus
he *angular aperture* is double what has hitherto been achieved.
The plan of the lens is this: the two lenses of the combination are
symmetrical, and are so mounted in the tube that their outer sur-
aces shall form a part of the surface of the opposite segments of
of the same sphere. These outside curves subtend an angle of about 180°, and thus the combination is brought within a convenient length. A small stop is placed midway between the two lenses, and at the centre of the sphere. The lenses being symmetrical, either end of the tube may be turned to the view. The trials with these lenses show that they give a *flat field, and a more perfect rendering of straight lines than any other lens.* Petzval does not claim as much for his orthoscopic lens, although he professes in that to have exhausted the subject. Mr. Harrison's lens is not intended to take the place of the ordinary portrait lenses except for groups. Portraits do not require a very wide angle of view. Mr. Harrison has taken the proper steps to secure his invention by patent. [Mr. Rutherford then presented negatives and prints to illustrate the properties of the lenses.]

Mr. Seely said he had in his possession a camera made probably about twenty-five years ago, which had some resemblance to that of Mr. Harrison. The lenses are symmetrical plano-convex, with a midway stop. They are adjustible, but probably were never so far removed that the curves should lie in the same sphere.

Mr. Rutherford: Mr. Harrison seems to make it a capital point that the lenses shall be so adjusted that the curves are permanently in the same sphere, moreover the lenses are of the meniscus form.

Mr. Seely: I am unable to see the necessity of such an adjustment. Mr. Sutton appears, in his panoramic lens, to have appreciated the advantage of the curvature of great angle.

Mr. Rutherford: Have you seen the work of the panoramic lens?

Mr. Seely: Yes, and it is not comparable to what is here exhibited. The field of the panoramic lens is curved, a fact which is a serious objection to it.

Mr. Tillman believed that Mr. Harrison had made a great invention, and was deserving some marked commendation from the Society.

Mr. Johnson: Mr. Wolcott, of the firm of Wolcott and Johnson, was a very skilful optician, and carefully studied the requirements of photographic lenses. He was fully competent to make the preliminary mathematical calculations, and carried them out practically with his own hands. The result was that he made combinations which were new in his day, twenty-five years ago, and some which are still not generally known. He had instruments especially adapted to the purpose for which they were used: he had a camera for copying, for enlarging, and I remember distinctly a camera similar to Mr. Harrison's, which Mr. Wolcott called his ninety-degree camera, for making views of a wide field. I cannot positively say that it is the same, but the instrument was patented, and the full particulars may be found in Newton's Journal of 1844 or '5. The copying camera was a combination of planos, and Mr. Wolcott was well satisfied of the plan, and often complained that he was obliged to use the "expensive flats."

Mr. Seely did not wish to be understood as opposing Mr. Harrison's or any genuine invention. If Mr. Harrison deserved praise he desired to be among the first to accord it to him. The subject is of great interest, and if any opinion goes out from the society it should be only after due deliberation. It should be first referred to such as are skilled in optics and in the requirements of photographic lenses. He therefore moved the appointment of a special committee consisting of Messrs. Fitz, Rutherford, and Johnson. [The motion was carried, and President Draper was added to the committee.]*

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

You have now laid in the head. The lights are clean and bright, and in harmony with local peculiarities of colour; the tints gradate by becoming less and less luminous as they melt into the retiring or broken tints, and these demi-tints, as they are called, glide just as imperceptibly into the shadows. Softness, roundness, and cleanliness should characterise your work at this stage of its progress. If, however, your inexperience has resulted, as it generally does, in a failure, take your brush-rag, wipe all the colours from the photograph, and, as the child's song says, "try, try, try again!" After each trial, pause and examine the work, criticising it as impartially as you can, and rejoicing in every discovered fault, by thinking how much better it is for you to discover and remedy, than for others to discover and ridicule, them. See that the half-tones which break the yellowish tints are greenish; that the deli-

* For editorial remarks upon the preceding see our Leader in this number.

cate blues are to be found only where the skin is most white; and that the greys, into which the carnations melt, are first of a lilac, and next of a violaceous tone, becoming gradually colder as they retire from such influence, or begin to be characterised by other qualities of local colour. If you are painting—as I now suppose you are—a fair complexion, see, too, that the shadows are not inharmoniously red. Observe that where the bones are in more direct contact with the skin it is indicated by a slightly yellowish tinge; that the rosy hue suffusing the cheek is not of one uniform colour, but is full of charming inequalities; that the down on the skin is truthfully indicated by its effect in softening the illuminated passages, and spreading cool light over the shadows;* that the lights on the lips glisten more brightly than those upon other parts of the face, in proportion to the amount of illumination; and so on. You may sit before your work and admire it too, if you like, providing you also resolve to pick it unmercifully to pieces afterwards.

HAIR TINTS.

Light.

White, Naples Yellow, and Raw Umber.
White, Yellow Ochre, and Vandyke Brown.
White, Black Lead, Burnt Sienna, and Yellow Ochre.
Raw Sienna.
White, Raw Sienna, and Burnt Umber.

Brown.

Raw Umber.
Raw Umber and Cappah Brown.
Cappah Brown.
Vandyke Brown.

Dark.

Black, Brown, Ochre, and Madder Purple.
Vandyke Brown, Lake, and Indigo.
Vandyke Brown, Black, and Lake.

FOR THE HIGH LIGHTS OF FAIR HAIR.

White, Black Lead, Yellow Ochre, and Vandyke Brown.
White, Light Red, Black Lead, and Raw Sienna.

FOR THE HIGH LIGHTS OF BROWN HAIR.

White, Light Red, Ultramarine, and Vandyke Brown
(or the above tints mixed in different proportions).

FOR THE HIGH LIGHTS OF DARK HAIR.

White, Ultramarine, and Blue Black.
White, Black Lead, and Indigo.

The greys of hair will be toned down when dry with the local colours, and richness got in the shadows by glazings. It is sufficient for the present, therefore, to lay in the colours so as to preserve the drawing and texture, but kill the too dark colour of the photograph.

Foreign Correspondence.

Paris, February 25, 1861.

I SPOKE to you lately of the experiments which are being made by Nadar for the purpose of applying the electric light to photography. I shall shortly be able to give you an account of those by Bingham, undertaken with the same object. The last meeting of the Society was almost entirely taken up with trials of the same nature. The apparatus employed (Duboscq's) is very ingenious, but also very complicated: the light is regular, but its intensity is not great. The amplified image of a *cliché* of six square centimetres (about 2½ inches) was thrown upon a screen bearing a sheet of iodised paper. The exposure at first lasted 140 seconds, and then was extended to three minutes. In the latter case a very vigorous picture was obtained in the development.

Count Aguado is about to repeat these experiments in his private operating-room—one of the best organised in Paris. I will keep you informed of the results.

M. Fargier, who was present at the meeting, gave orally the same description of his carbon printing-process that he had already given by letter, but he added some important details. One condition essential to success is the uniformity of the film of gelatine, and the intimacy of its mixture with the powdered charcoal. The exposure in the frame lasts from three to four minutes, but when the glass is withdrawn the image is not visible, and only becomes so in the washing: this, however, is a matter of experience, for which a little practice will suffice. The collodion with which the picture is covered for the purpose of transferring must be a rich one, and uniodised. The glass is dipped into lukewarm water and the collodion comes off and floats upon the water, which must be renewed after a few minutes. This operation is performed in a white-bottomed dish, so that the image may be seen better, and its successive phases followed more closely.

M. Fargier is endeavouring at present to shorten his process by one-half by substituting for the collodion film a sheet of thin transparent paper.

M. Girard read a paper in which he called the attention of photographers to the dangers arising from the use of the cyanide of potassium. He mentioned a very serious case which occurred quite recently. An amateur having washed his hands with cyanide, a small particle lodged under his nail; and, though there was no cut visible on the skin, he became subject to serious symptoms—throbbing in the arteries of the temples, congestion, difficult respiration, a general chill resisting friction, &c., which only yielded to a prompt and energetic treatment. We all knew Mons. Juleo Couppeau, of Paris, who had acquired a reputation by some remarkable stereoscopic pictures upon glass, and we all are aware that he died from incautiousness in the use of cyanide. I remember myself that, while staying in London some years ago, I made some experiments with a friend, and then, to remove the stains on my hands, used soap prepared with cyanide. I was almost immediately seized with giddiness and pain in my throat, which rendered me ill for all that evening. In juxtaposition with these facts I can point out many photographers who employ cyanide with impunity, and do not even take the precaution of seeing whether they have any scratches on their hands. It is certain that this product is very dangerous, and requires to be used with great prudence; but at the same time it is very evident that it does not act with equal rigour upon all constitutions. It is the same with many other and less noxious substances employed in photography. I have known daguerreotypists upon whose systems the vapours of mercury acted so energetically that they lost their sleep. Ether affects others in a painful manner. Recently an amateur, Dr. Siguoret, announced to the French Society of Photography that he found himself obliged to relinquish the art in consequence of the injury that the emanations of the laboratory had caused to his health. At all events, then, M. Girard's advice should be followed. Cyanide is employed in photography for fixing pictures and for taking out stains. In the first of these applications it can be replaced by hyposulphite of soda; in the second by a solution of from five to six grammes of iodide of potassium, in twenty-five cubic centimetres of water, to which must be added some iodine in crystals.

You have probably seen in the last *Bulletin* of the French Society of Photography the note in which M. Leon Foucault sums up what he said in respect to the debate of which Woodward's apparatus was the subject. You have remarked that the conclusion of the first part of the note—that relating to the objection raised by M. Claudet's paper—is the same as that which I sent to you at the time of the meeting. As regards the latter part of the note—in which is discussed the value of the apparatus—I of course was unable to say anything about it, as M. Foucault himself did not speak of it before the Society, but added it when drawing up his communication.

On the first of March there is to be a special meeting for experimenting with the electric light. I have reason to think it will be interesting, and I shall not fail to give you an account of it.

ERNEST LACAN.

New Books.

A Manual of Photographic Chemistry. By T. F. HARDWICH, late Demonstrator of Chemistry and Lecturer on Photography in King's College, London. *Sixth Edition.*

London: JOHN CHURCHILL, New Burlington Street.

THIS is the third occasion upon which we have been called, since we have had the honour of conducting this Journal, to notice a new edition of the work now before us, and it is less than two years since the last one was issued. It does not often happen that the labour of the critic is great when dealing again and again with the same work; but in the case before us the identity is preserved much in the same way as occurs when the child becomes a youth and then attains to manhood. The author, too, may well exclaim:—"When I was a child, I thought as a child, I understood as a child; but when I became a man, I put away childish things;" for, not only has he advanced with the times, adopting all that is new and true (much of which is due to him directly or indirectly), but he has also not hesitated to cast away what mature experience has proved to be worthless and unsatisfactory, not shrinking from the sacrifice of much that had a "show of wisdom," and which he himself had formerly advocated before

* Examine this down upon your hand, and you will find that it possesses the velvet-like character of being darkest when in direct light, and light as it retires into shadow, growing lighter at the outlines, which it does much, also, to soften.

he had proved its inefficiency—thereby setting an example of moral courage worthy of imitation. It was jocosely remarked by Capt. Marryatt, in his novel of *Midshipman Easy*, that old Mr. Easy "was placed in the dilemma of having to sacrifice his theory or his son, so he chose the lesser of two evils and sacrificed his son"—so hard is it thought to be to give up a cherished theory. But, notwithstanding the withdrawal from time to time of a considerable quantity of matter, the *Manual* may truly be said to have both grown and strengthened under the author's fostering care. He appears to have been constantly on the alert, laying by a store of valuable matter against the time when a demand should have arisen for another issue; so that with each succeeding edition, though we have recognised a familiar and valued friend, we have scanned his features closely to note the many changes that time has wrought in him.

We now proceed to notice a few of the improvements which we notice in the issue before us. In the first place the elementary and the more detailed facts of the work are distinguished by the employment of two sizes of type, thus facilitating reference. The theoretical consideration of photography upon dry collodion has been entered into, and an important improved method of working it, emanating from Major Russell, has been introduced. There is much new matter with reference to the theory of the latent image; and, what practical photographers will regard as of still more importance, the whole of the chapters relating to the subject of positive printing have undergone revision and re-arrangement, and the addition made of a considerable amount of new and valuable matter in all parts of the work. In fact, on reference to the memoranda we have made on going through the work, with a view of indicating the various points of reconstruction, we find them so numerous that we must content ourselves with indicating instead where they may be found in the work itself; and even with the following we have by no means included the whole of the improved portions of the text.

There are doubtless many who possess the earlier editions who will still think it worth their while to procure a copy of the new one, and to them the information where to look for some of the new matter may be useful. Some will be found at pages 38 to 48, 80 to 82, 108 to 116, 126 to 129, 155 to 160, 163, 165, 168, 173 to 190, 213 to 237, 377, 378, 387, 420 to 427, 442 to 444, and several matters in the Appendix.

We may remark, with reference to the new dry process of Major Russell's introduction, that though we have been acquainted with the particulars of it for several months past, we have been unable from want of opportunity to put it to the test of practical trial; but we are aware that it has been experimented upon by some of the most skilful veterans of our art, including our friends Alfred Rosling and Frank Frith, who both entertain a high opinion of its value. The principle consists in carrying out the views advocated by Dr. Hill Norris as regards the removal of all free nitrate of silver and the introduction of matter to prevent the cuticular-like condensation of the collodion film which otherwise occurs on drying, and thus interfering with its permeability to aqueous solutions; and at the same time the new process supplies an organic substance which adds materially to the intensity of the image formed without interfering greatly with the sensitiveness. The preservative agent employed is tannin, one not expensive and easily procurable at almost any druggist's shop in the kingdom. For the details of the manipulation we must refer to the work itself, as we do not think it would be just to either author or publisher to extract so valuable a portion without express permission to do so first being obtained—a permission which we should scarcely consider it reasonable to ask for.

Mr. Hardwich's services to photographers as a body have been readily and almost universally acknowledged; and to our thinking he has deservedly earned the designation we have more than once heard applied to him—"The photographer's good genius." Long may he live to enjoy the admiration and gratitude of all true lovers of our art!

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

ART AND TRUTH *versus* WHITE SKIES.

To the EDITOR.

SIR,—While pleased with your very able leader of February 1st, I really must take exception to your remarks about white skies. I can't, by-the-by, make out who the sage and doubtless *very young* hero of the rails and church steeple could be; but it would not puzzle me to give him a name, rightfully his, although not bestowed by his Godparents.

I have been very active in denouncing "white skies" (I can't for the life of me make out *why* white paper should be called a *sky*); and if such monstrosities are to be *upheld*, I—in the absence of a better man—shall be very eager and glad to enter the ring, put on the gloves with their defenders, and do battle for the cause of photography as pictorial art. With your permission I will therefore "strike," but am very ready to "hear."

White skies destroy the effect of space and atmosphere—the most important elements of a picture. They are utterly destructive of breadth, without which no *picture* is successful. They ruin vigour in the lights, give undue force to the aërial tones of the middle and extreme distance, and kill all the various important effects which have their source in a proper scale of tones.

These are my accusations, and I am prepared to defend them "against all comers" with every weapon of honourable warfare. And so "there is my gage."

I am emboldened to write this by considering that, while the mistakes of ordinary folk are made chiefly at their own expense, when an authorised leader jumps into error there is always an army of thoughtless followers ready to take the same leap.

Let us say that you, my dear sir, want to convince yourself that the sky is never white. Well, you select such a day as that described in your otherwise excellent article, when, as you say, the sky is white, or very nearly so. You ramble on until you see the tower and spire of a new church rising up against the *white (?)* sky. The light is full on the spire and tower, and they stand out against the sky in full relief. How is this? If the sky is *white*, what can the tower and spire be, standing out, as they do, so much lighter and brighter against the sky? But what shall be said when that spire and tower, gleaming in the purity of *apparent* whiteness, are found to be as far removed from white, when compared with a piece of white paper *placed in the light*, as the sky is when compared with the tower and spire?

Pray don't defend white paper skies (?) which are the most inartistic and ugly of blunders—the cruellest offenders against good taste—and the most glaring violaters of pictorial truth. Our operators are beginning to waken from a sleep, and the cry that has arisen against white skies is the cockcrow of that dawn which will brighten into the full daylight of art. Don't check it—there's a good fellow!—*don't!!*

I'm afraid the above epistle is hardly formal enough for the dignity "which doth hedge" an Editor from the vulgar world; but then, you know, I have chatted and laughed with his high mightiness in private, and know him to be a frank, genial, hearty, unassuming sultan of the pen, whom the humblest scribe may approach with his slippers on and his head erect, and I am, really, very sincerely and *respectfully* his,

28, *Old Bond-street, W.* A. H. W.

[We find on reference that the Editor of the *Journal of the Photographic Society* exercised a wise discretion in publishing only an *abstract* of the paper (see Vol. I. p. 74), to which allusion was made and in it nothing is mentioned about the "illustration."

We fancy that the term *white paper sky* originated with our worthy correspondent—certainly not with us.

We perceive that the full force of the argument is directed against the word *white*. Suppose, then, we print upon "cream-laid" paper—will that do? But, to cease joking, we are not advocating *white* skies strictly so called; but if we cannot have natural ones, we decidedly object to those scowling, dark grey affairs, that seem to have appeared of late in order to avoid —— well! not *white*—but—clean skies. However, we are open to conviction, so we will think it over.—ED.]

ALABASTRINE POSITIVES.

To the EDITOR.

SIR,—Your solution of the difficulty represented by your correspondent, Mr. Hele, viz., the browning of the alabastrine positives from the discolouration of a chloride of silver, formed by the double decomposition, is certainly the most probable one.

The rapid darkening by light of the chloride of silver, particularly in presence of any free nitrate, forms the basis, as we all know, of our printing. Let your querist, then, do as I find indispensable for the perfect whiteness of these positives—not merely wash thoroughly after clearing with cyanide, but set the plate up to drain afterwards, until the film is left merely damp, without fluid upon its surface; and even then, upon the thick edges, he will find a yellow iodide of mercury formed, showing that the whole of the excess of silver has not been dissolved out by the cyanide.

When surface-dry (not, of course, film-dry), then let him pour over the following solution, and the most perfect whiteness may be relied upon.

The ordinary solution of bichloride of mercury so rots the film that, unless the pyroxyline be prepared with acids at a low temperature, so as to produce a tough and firm film, a proper amount of washing cannot be used: this solution has no deteriorating effect upon the coating.

Make, first, a perfectly saturated solution of chloride of ammonium, in rain water; take of this one ounce; dissolve in it half a drachm of bichloride of mercury; it will readily take it up, and when set by, for impurities to settle, it is fit for use.—I am, yours, &c.,

23*rd February*, 1861. C. COREY.

THE HYDROMETER SILVER METER QUESTION.

To the EDITOR.

SIR,—Will you be good enough to allow me a few lines in THE BRITISH JOURNAL OF PHOTOGRAPHY, in connexion with a question I have unfortunately got *seriously*, though I hope not *dangerously*, entangled with. The hydrometer silver meter question seems likely to be a prolific one for photographic journals. One article, in reply, has already appeared in the columns of a contemporary, to which I will be expected, and indeed to which I would feel disposed, to reply at once; but, as other gentlemen

interested—or I should rather say implicated—in this discussion, are said to be preparing replies, I think it will best serve the cause of truth and progress if I wait with my rejoinder till those opposed to the conclusions of which I am the humble exponent have had the opportunity of combatting my views on this question, when, with your permission, one article will, so far as I am concerned, close the discussion.

I still think, as I expressed at our Society's meeting, that a well-selected committee would have most satisfactorily settled the question.

I am, yours, &c., JOHN CRAMB.

67, *West Nile Street, Glasgow, Feb.* 23, 1861.

CONJUGATE FOCI.—VERY SMALL LENSES.

To the EDITOR.

SIR,—Happening to be at the last meeting of the Photographic Society of Scotland, I heard a paper read, the production of the well-known M. Claudet. It was about taking the focus of lenses and a lot of other things connected with lenses, of which, I honestly confess, I could understand little or nothing.

What I wish to call M. Claudet's attention to is this, that we, in the far north, are perfectly alive to the importance of having a table such as, if my ears did not deceive me, M. Claudet assumes is not in existence, and which he is about to draw up; I mean a table by which the photographer may determine *a priori* the degree of alteration between the size of the image and the original, by a scale founded on the focal length of the lens. M. Claudet will, I doubt not, be glad to be saved such an amount of trouble as he purposes taking upon himself, by being informed that a table was published, *some years ago*, in, I think, *Lay's Photographic Almanac*, and that it has been reproduced in other almanacs, and moreover is more generally known among provincial photographers than metropolitans may be aware of.

Since I am writing, at any rate, I may inform you that Sir David Brewster has proved himself a friend to the poor photographer, by showing that portraits may be *better* taken with a lens a quarter of an inch in size than with our large and expensive compound achromatics. I have no doubt that this is quite true, because Sir David Brewster says it; but, although I have procured more than one of the small lenses recommended by him, I have quite failed in taking pictures that can at all compete with those by the usual achromatics. Instead of taking a first-class portrait in three or four seconds, as I usually do, I find that an exposure of as many minutes with the small crystal lens fails to produce even a passable picture.—I am, yours, &c., O.

Leith, Feb. 22nd, 1861.

[Those who have read the able articles by Mr. Grubb, *On the Optical Centre*, published in our last volume, will perceive that with a *double combination* lens the tables named would be useless. Not having yet perused the paper by M. Claudet, we cannot of course remark upon it.—ED.]

IN EXPLANATION.

To the EDITOR.

SIR,—I fear I must have expressed myself very badly to have led you to think that I imagined that *you* had accused me of being an enemy to progress. The tone of your remarks would warrant no such idea. I simply meant to express surprise that I should have been so accused at all. That I have been so, I need only refer, amongst other similar productions, to an anonymous letter in your Journal, called "A Protest against Retrograde Movements," in which, after speaking of some process yielding yellow skies and fading prints, and, consequently, very different from any I ever advocated, the writer says:—"Such is the abomination to which Mr. Heisch wishes to drive us back," or words to that effect, for I have not the Journal before me. I will not here trouble you with any further remarks, as I again brought the subject before our Society, and you will see what I have to say in our report.—I am, yours, &c.,

Middlesex Hospital, Feb. 18, 1861. CHAS. HEISCH.

INSTANTANEOUS NEGATIVES.

To the EDITOR.

SIR,—Will you inform me, in the next issue of your Journal, on the 1st of March, what is the quickest and best collodion to use for taking negative portraits of children, as I am anxious to get some good negatives of my own little folks, and fear they will not be able to sit still the time requisite to get a negative full of detail with the collodion I generally use (——'s, iodised with cadmium), which gives me beautiful negatives in twenty seconds with Ross's quarter-plate lenses? To take children successfully the exposure should be as nearly instantaneous as possible, to secure the fleeting expression of the countenance which they cannot command at will; and I have thought of using a positive collodion and iron developer, and intensifying afterwards, but should prefer to use a *regular* negative process rather than a doctored positive one, if you can inform me of one sufficiently quick. I use a forty-grain neutral bath.

I shall be glad also of your opinion on the following questions:—

1st. If a solution of chloride of gold is poured over a plate prepared for the negative process, and sensitised, either when partially washed or when just out of the bath, what chemical change takes place on the surface of the film lately covered with free nitrate of silver?

2nd. Does the action of chloride of gold on the free nitrate or on the iodide of silver render the plate more sensitive to light, and therefore "quicker in action?" and would it be applicable to taking wet-plate pictures with an instantaneous exposure? If so, it might suit my idea for children's portraits.

I am exceedingly anxious to get good portraits of them, as they will be very interesting in after life, or should anything happen to them: the regular professional glass positives are my abomination. I also take all mine for the stereoscope, by a binocular camera.

Your kind assistance in the above matters will greatly oblige.—I am, yours, &c., CAPTAIN B.

P.S.—There is another matter which troubles me. I get a sort of water-mark on the lower edge of the negative, just over the head of the sitter, which sometimes extends one-third across the plate.

It is evidently caused by capillary attraction of some matter from the plate back, which is an old one, and much stained with nitrate; but to remedy it I have cut off all contact with the woodwork, and the plate now only touches two *silver* wires at the corners, but still the marks are there, and appear to come *distinctly* from the silver wires, and then to spread out from the corners like a tree or wavy stream. The mark is of a *lighter* shade than the ground of the picture, which is a neutral canvas background behind the sitter. I have washed the wires with dilute acetic and also sulphuric acid, but without curing the fault. What can I do to get rid of the trouble?

[1. We advise you to dissolve a grain of bromide of ammonium in the quantity of iodising solution required for an ounce of collodion, and to filter before adding it. Take your pictures in the open air: develop in the first instance with sulphate of iron, and subsequently intensify with pyrogallic acid and nitrate of silver. By this method you may expect to obtain a fully-exposed negative in two seconds, even in the shade. The bath is of the proper strength if it contains forty grains of nitrate of silver to the ounce of water; and, as regards the quality of the negatives, we can promise that they will be all you desire, if you are able to work in a tolerably bright light.

2. The chloride of gold should not be applied until the free nitrate of silver has been removed by washing, and in that case you produce subchloride of silver, and a superficial deposit of metallic gold forms upon the image. The process is not used before exposure in the camera, but subsequent to development, and is recommended for intensifying the negative; but we are not disposed to put much faith in it.

3. We know the "water-marks" of which you complain; but after adding the bromide to the collodion they will cease to annoy you.—ED.]

GARIBALDI.—Mr. Stortz, photographic artist, Liverpool, has just received the following characteristic note from the regenerator of Italy. Garibaldi has a son being educated near Liverpool, and Mr. Stortz forwarded to the parent a beautifully-executed portrait of his boy, finished in water-colours:

Mr. Stortz, Liverpool,—I am extremely grateful to you, kind sir, for the agreeable present made to me of the portrait, in water colour, of my Ricciotti. Thus we have now in our family an absentee whom we love. Command, pray, yours, &c.,

Caprera, Feb. 4th, 1861. G. GARIBALDI.

ANSWERS TO CORRESPONDENTS.

FAILURE.—We have some articles in preparation upon the subject.

BAWTRY.—We cannot recommend you to purchase the article indicated in your letter.

F. K.—Rather too blue in tone; you have left it a little too long in the gold bath. The formula is a very good one.

TIMID JOHN.—You need not fear to keep a moderate quantity of collodion on the premises, particularly as you are not likely to use it at night.

BINOCULAR,—You will find a description in the last number of the *Quarterly Journal of Microscopical Science*, published by Churchill.

R. M. F.—1. See remarks in our leader about paper.—2. We have seen very good results occasionally upon the arrowroot prepared paper.

J. N.—1. We prefer number *four* in your list, and next number *one*. 2. We believe it can, but it will not cover a larger field. 3. It is a matter of taste, but personally we have an objection to cameras of the bellows form.

LUCY.—It is certainly difficult to print many proofs, tone and fix them without soiling your fingers now and then; but by care and the use of wooden or bone forceps it can be done.

STEVEDORE.—Mr. Moens packed all his paraphernalia in a small compass, but it was a heavy package of course. We know of no method by which to make a pound *weigh* but a few ounces, though the *bulk* may sometimes be reduced. We suspect you are joking at our expense.

T. L.—There is a species of yellow woollen material, called "tammy," which is better than yellow calico for your purpose. Thin sheet india-rubber has been used for windows for a dark room. Thick yellow silk answers very well. The oiled silk which we get in London is generally deep yellow.

SEEKER AFTER TRUTH.—We know the gentleman to whom you allude intimately, and have no hesitation in asserting that you may rely implicitly upon the accuracy of his statements, and not only so, but upon the soundness of his judgment also—which is a quality second only in importance to the preceding.

JAMES SHAW.—1. You will find the formula in the Almanac for the present year, issued with our last 15th Dec. number.—2. The best kind of bath to use is decidedly a glass one, mounted in a wooden case, with a water-tight top. The glasses can be procured of Mr. J. A. Forrest, Lime Street, Liverpool, and also ready mounted from most of the dealers in apparatus.—3. If you will re-peruse the "Letters to a Photographic Friend," published in our last volume, you will be able to select what you prefer—better than we can advise, not knowing exactly your requirements.

DELTA.—We have never seen the camera you mention; but, on principle, we should have nothing to do with it. A *multum in parvo* is generally cumbersome, costly, and, above all, ricketty. Choose the size you intend to adopt (9 by 7 or 10 by 8 we recommend), then have a single rigid camera constructed, of common Honduras mahogany, *not too thick*—three-eighths of an inch is plenty. Have a *leather* handle to carry it by, and arrange it so as to pack your dark slides and lens *in the camera*, and do not bother yourself with a case. If it gets scratched (as it will), never mind; and when too rough have it re-polished.

*** We have been overwhelmed with matter for the present number, and we have therefore been obliged to defer till our next numerous critical and other articles in type.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 138, Vol. VIII.—MARCH 15, 1861.

Asperities and Amenities,—We have observed with considerable regret that a paper by Mr. C. Jabez Hughes, advocating the employment of a little instrument constructed upon the hydrometer principle, for the purpose of ascertaining approximately the strength of a solution of nitrate of silver in use for exciting positive printing paper, and which was read at the January meeting of the North London Photographic Association, has been the cause of much acrimonious feeling—in our opinion very unnecessarily—amongst the members of another Society; and has very unreasonably subjected the author to certain animadversions and misrepresentations, couched in language which ought not to be permitted to go forth to the public without condemnation. Every person who publishes an article by that act invites fair comment and criticism; and we have upon several occasions drawn attention to the general advantage arising from the publication of the reports of the various metropolitan and provincial photographic societies on this very account—an interchange of ideas and correction of erroneous doctrines being the usual result. But it is to be regretted that occasionally a member of some one society, in commenting upon the doings of somebody belonging to another society, has appeared to think it unnecessary to observe the amenities and courtesies which would probably not have been violated had they been actually brought into contact with one another. This is a state of things much to be deplored; and we think it our duty to urge upon all who have to join in any kind of discussion, but especially when carried on through the medium of the press, to adopt for their rule of conduct the excellent precept—"*suaviter in modo, fortiter in re.*" The prime objects of every photographer belonging to any society may be assumed to be "progress and the ascertainment of truth." Why then should one object to his neighbour for exploring an unknown region on foot because he prefers to go on horseback? If all were agreed, where would be discussion? The pebbles on the shore have their asperities removed and their angles rounded by long-continued gentle attrition with one another, whereas violent collision breaks and roughens them. Let us then not forget that harsh words and unkindly feelings do more towards the hindrance of progress and improvement than even the inadvertent promulgation of erroneous doctrines; because in the latter case there is every chance of correction where feelings of consideration for each other exist, while the former altogether precludes unbiassed discussion. We have frequently exercised our editorial discretion in removing a few "personal" excrescenses from articles which have appeared in our columns—occasionally to the momentary disapproval of the writers; but in no single instance have we hitherto found that such dissatisfaction has been permanent, while in most cases we have subsequently been assured by the temporary malcontents that they have eventually found reason to rejoice in our exercise of power. These concluding observations have been rendered needful to account for a few trifling discrepancies which may have been apparent to such of our readers as peruse also the pages of a contemporary.

South Kensington.—We would direct attention to a letter from Mr. Scott (of the firm of Colnaghi and Co.), which will be found in the usual column. We rejoice to perceive that some concession has been made to the just demands of photographers, but at the same time protest against their exclusion from access to public property under reasonable conditions.

Caution.—Amongst the abuses to which photography has been applied, we have just heard of one against which it may be as well to record a few words of caution, in order to save others besides our informant from any chance of falling into a similar trap. We may remark that the truth of the following is unquestionable.

A gentleman, only temporarily resident in London, and who is shortly about to proceed abroad, having been asked by several of his friends for his likeness—which from the bad weather and other hindrances he had been unable to have executed—was proceeding along one of the not very agreeable streets lying between the back of the Borough Market and Westminster Bridge, which route he had taken in order to save time.

Passing by a large shop, in the window of which a considerable number of photographs were displayed, his attention was arrested by the announcement—"Photographs taken at Night." This being a complete novelty to him, and feeling some interest in the art, though not a photographer, he thought he should like to see by what sort of operation a nocturnal photograph could be executed. The price offered no impediment to the gratification of his curiosity, being placarded all over the place as "*Only Sixpence!*" and this was confirmed on application to the man at the door. So he immediately entered—not indeed expecting to get anything fit to present to his friends, but out of mere curiosity. We mentioned the preliminary circumstances simply as accounting for the reason why a complete stranger to photographic practice should have gone into such a place. He was requested to sit down: the camera was pointed at him, the firework "let off" in what we recognise from description to be one of Moule's photogens, the likeness pronounced by the operator to be capital, and he was told that in five minutes it would be ready. In five minutes he had handed to him a minute scrap of glass, surrounded by a little piece of thin brass encircling a ghastly-looking object that he was told resembled himself. He of course laughed quietly, and handed out his sixpence. But he was not to escape so easily: he was informed that he must pay *half-a-crown!* With this demand of course he declined to comply, referring to the announcement outside, and to the statement of the man at the door. There now appeared several other men, of villainous aspect, on the scene of action, who joined angrily in the contest, and, spite of all remonstrance, vowed that he should not quit the premises until he had paid the *half-crown* demanded. Feeling that he had done a foolish thing to enter at all (though not wanting in physical courage), he did not relish the idea of a report of any disturbance in which he might be involved by resistance finding its way into

the newspapers, so he very reluctantly submitted to the black mail demanded, as electing the lesser of the two evils offered to his choice.

It is probable that one more accustomed to London and its ways would have known that there was but little to fear on account of *newspapers*. Metropolitan journals have more important matters to chronicle; and, even were it not so, gentry of the class to which those above indicated belong are usually very shy of being made much of *in print*—a reason why we confer upon them the honour, and thus drag modest merit (!) from its obscurity.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XX.

In our article for this number of the Journal we propose to consider a few points bearing on the use of the "Hydrometer Silver Meter" as a test of the strength of old printing baths. At first we were much opposed to this instrument, but, after a trial of some months' duration, decided on giving it our recommendation. In doing so we did not perhaps point out its errors as clearly as would have been desirable had we looked upon it in any other light than that of convenience and practical utility.

The most accurate plan of estimating the quantity of silver in a solution of the nitrate of silver is by a standard solution of salt. In throwing down silver as chloride, and weighing it in that form, we scarcely expect to be correct to the hundredth of a grain; but in the humid assay process they report easily to the 1-500th of a grain. To secure this accuracy, however, many points have to be attended to; for, not only must the eye of the chemist be educated to appreciate the varying intensity of cloudiness due to suspended chloride of silver, but the pipette must deliver exactly a given bulk of solution, even to a single drop, and, most important of all, the real strength of the salt solution must be correctly ascertained. To effect the latter object a stock of metallic silver, prepared purposely in a state of absolute purity, is always kept on hand; and, when an assay is to be made, a portion of this silver, weighed with extraordinary accuracy, is dissolved in dilute nitric acid, and precipitated at the same time with the other, as a check upon it. The whole process, in fact, is a model of scientific precision, and it is impossible to witness it without gratification.

When the photographer adopts the use of the standard solution of salt in estimating the strength of the bath, he usually falls considerably short of accuracy—partly from errors in measurement, and partly from imperfect manipulation and uncertainty in the strength of the soluble chloride. It would not perhaps be wrong to conjecture that, taking a number of experiments made upon a 60-grain bath by different individuals, with various measures and bath-testers, the average would be three or four grains to the ounce from the truth. Such, at all events, was our impression after submitting "an old albumenised paper printing bath," sent to us by Mr. Hughes, to analysis in an assay office to which we have access. The real quantity of nitrate of silver contained in the bath was 51·41 grains per ounce, whereas it had been estimated in previous examinations at 54 to 56 grains to the ounce.

The specific gravity of the foregoing bath, taken at 60° Fah., indicated between 55 and 56 grains of nitrate of silver to the ounce, so that the error amounted to about 4½ grains, which is not very serious. Let us consider for a moment whether this error is greater or less than might have been anticipated; and in doing so we will assume the case of a 60-grain bath, weakened by dry chloride of ammonium down to one of 30 grains, and the whole of the soluble nitrate left in the solution. Thirty grains of nitrate of silver are equivalent to about fourteen grains of nitrate of ammonia; and hence, if we take away the former, and insert the latter, the fluid ounce ought to weigh sixteen grains lighter than before. In point of fact, however, it loses considerably more than sixteen grains, for a reason which the chemist understands. When saline bodies dissolve in water they produce a certain amount of *expansion* in the liquid, and this expansion is sometimes greater and sometimes less. No certain rule can be laid down, but it has been found that bodies of a similar crystalline form often produce the same expansion, and that salts of ammonia produce more expansion than the corresponding salts of potash.* If you take fourteen grains of nitrate of ammonia, and dissolve them in a bottle holding exactly a fluid ounce of water, nearly nine minims of liquid will run over the sides of the vessel, and the fluid ounce will weigh rather more than five grains heavier than before. Now take sixty grains of nitrate of silver, and dissolve them in an ounce of water as before, when again nine minims, more or less, will be lost, and the bottle will weigh fifty grains heavier. Therefore, we are not far from the truth in saying that the expansion produced by fourteen grains of nitrate of ammonia is equal to that of sixty grains of nitrate of silver; and hence it follows that the hydrometer graduated for nitrate of silver is less affected by the presence of nitrate of ammonia than would have been anticipated. We may state in general terms that a 60-grain bath, weakened to a 30-grain, as above described, ought, according to our calculations, to float the hydrometer at the line indicating forty grains of nitrate of silver. On the one hand there would be the contraction of the liquid due to the removal of thirty grains of nitrate of silver, and on the other the expansion produced by the fourteen grains of nitrate of ammonia; but the former would not balance the latter, and hence the error becomes lessened.

But, in recommending the hydrometer silver meter, we have always done so under the conviction that much of the nitrate of silver is abstracted from the bath without any giving out of nitrate of ammonia in return. On immersing strips of gelatine in a 20-grain solution of nitrate of silver, we found the strength of the liquid to be reduced as far as three grains to the ounce—the nitrate having combined with the animal substance without liberation of nitric acid. Our intention before commencing this article was to ascertain exactly the amount of nitrate of silver appropriated by the albumen and the chloride respectively, in floating papers. In carrying out the experiments, however, difficulties arose; one of which was, that the quantity of solid matter left on evaporating an egg to dryness in *vacuo* over sulphuric acid, did not correspond with that given in the works on physiological chemistry. At present, therefore, we leave the matter for further consideration, merely calling attention to the fact that an absorption of nitrate of silver, without production of a nitrate of any other base, must necessarily diminish the error in the indications of the hydrometer.

In conclusion, we would incidentally mention other sources of fallacy in the use of the hydrometer silver meter, such as varying temperature, solution of organic matter in the bath, &c. The scientific chemist is indeed compelled to satisfy his conscience by exclaiming against this instrument, as unphilosophical; but, having done so, he may yet purchase one, if its occasional use promise any saving of trouble. We would ask him, however, to attend to the nature of the chloride used in salting; for it is evident that, if chloride of barium be employed, the error will soon rise to a point which becomes alarming. We imagined that chloride of barium had fallen into disuse at the time of the introduction of the alkaline gold toning, since carbonate of soda precipitates carbonate of baryta in solutions of that salt. In a report of the Blackheath Society, however, it is stated that the President and Mr. Negretti consider this fact, from various causes, to be practically unimportant. However that may be, we feel sure, without further inquiry, that those gentlemen are not likely to adopt the hydrometer silver meter as a test of the strength of their old printing baths.

* "Alum contains twenty-three anhydrous atoms, and twenty-four atoms of water: on dissolving alum in water the space occupied is exactly that due to the water, the twenty-three anhydrous atoms taking up no space of themselves." — *Playfair and Joule, Chemical Gazette*, vol. III., p 377.

DELICATE TEST FOR ORGANIC MATTER IN DISTILLED WATER.

By T. A. Barber.

[Read at a Meeting of the North London Photographic Association, February 27, 1861.]

Amongst the innumerable reasons assigned for the cause of failure in the exciting bath, one which has struck me as being somewhat singular is that of the nitrate of silver having been wrapped in paper; for if the contact of dry nitrate takes up organic matter from the paper, what must be the effect of its solution running through filtering-paper? Certainly one is sized and the other not; but to contaminate the silver the size must be abraded and left on the nitrate of silver—not *vice versa*—which I am inclined to think is more likely to be the fact.

To elucidate this matter I produce three bottles — one with neutral, another with acid, and the other with alkaline (*i. e.* saturated with oxide) solution of thirty grains of nitrate of silver to the ounce, and which have had some days' exposure to the light. It will be observed that in neither case is there any discolouration of the liquid, nor any precipitate, which might have been expected had the paper imparted organic matter of an injurious tendency. The papers acquired their blackness at different intervals—first the alkaline, then the neutral, and lastly the acid.

A much more likely source for tracing organic matter lies, I think, in the distilled water. I produce some samples of distilled water that has been kept some considerable time, to which have been added nitrate of silver one grain to the ounce, acid, alkaline and neutral. It will be observed that the alkaline has finished its business first and crusted the organic matter on the bottle, the neutral partially so, whilst the acid still retains it in solution. I have some here, a portion of a carboy just opened, and fresh from a wholesale druggist's—an indirect but general source from whence most photographers are supplied. These samples tell the same tale, but to a much more limited extent; and, having had only a short exposure to light, the state of transition is different—the alkaline has completed its work, the neutral still holds the organic matter in solution, whilst the acid gives no evidence of its presence. The other two bottles are from one of our oldest-established druggist's. Like all other samples I have tried, it will not stand the test of alkaline nitrate.

It should be understood that distilled water can never be relied upon for purity. That which comes over first—some say the first—ought to be thrown away. Nor should the still be used for any other purpose. Waste steam from an engine is sometimes made available.

Water containing no inorganic matter suffices for most chemical operations; but, if it be a *sine qua non* in photography that no organic matter be present, we have a ready means of freeing it from all that is incompatible with the salts of silver by treating it with a weak solution of alkaline nitrate of silver. I say a weak solution, because I find it attended with such satisfactory results. I have not tried a thirty-grain alkaline, but here is a thirty-grain neutral: it gives no evidence of contamination, whilst the same water with one grain develops it most clearly. Nor have I tried the oxide above: of course more would be added than the water could dissolve, and its sediment would prevent the observance of precipitated organic compounds; and I have no hesitation in saying that, provided a new bath be dosed with oxide of silver, and exposed to the light, it matters not what water is used for making it —distilled or not.

AN APPEAL TO PRACTICAL PHOTOGRAPHERS.

By Alfred H. Wall.

[Read at a Meeting of the Photographic Society of Scotland, March 12, 1861.]

It is with no small pleasure that I respond to the invitation extended to me through the editor of the *Photographic News*, by placing in your hands the following unpretending paper.

A new branch of art has arisen, to the improvement and advancement of which this and kindred associations have been generously devoted. Its numerous applications and their varied character have procured it admirers, professors, and practitioners among individuals of the most diverse character, inclinations, sympathies, and pursuits. It ministers to the pettiest sentiments of the meanest natures, and it soars above the aspiring ambition of the loftiest: now depicting the simpering expression of personal vanity; now bringing through the measureless abysses of space those mysterious images of other worlds, rolling in silent majesty upon their God-appointed ways. Filling the awe-struck soul of the mightiest astronomer with new thoughts and fresh conclusions as he compares their invaluable records with those written by the Divine hand, high in the mighty dome of the hushed and solemn night; and delighting the illiterate serving-man or maid with a sooty and distorted image of vulgar finery and common-place features in a sixpenny glass positive, "with frame and glass, with a ring to hang it up by," all included.

The mere "man of facts"—as he delights to call himself—travelling in his little circle of ideas, with imaginative faculties and poetical sentiments locked up in darkness, and guarded by the stern, hard gaolers of common-place utility and selfish advantageousness, patronises photography; "for," says he, "it is uncompromisingly true: it takes my portrait, and it gives me the wart on the cheek and the squint in the eye, exactly as I am. It produces me a landscape, and I can count the leaves on the trees, the bricks in the walls, and the tiles on the roofs." And again: the poet, lover of beauty, worshipping at the shrine of refinement and art, finds in the less common specimens of artistic photography food for the highest thoughts and sources of the most ennobling emotions.

Such is the art we as members of photographic societies have the privilege of training through its infancy, and educating for the glorious missions of its coming manhood. I think it is high time that this young giant, Photography, should learn that, apart from its wonderful and invaluable qualities as a scientific agent, and high above the perfection of manipulatory or mechanical details—which, after all, are but means to an end—it should prepare to take higher rank with the loftiest and most humanising of intellectual tendencies, *as a fine art.*

The arts in their highest state of progress indicate the refinement and opulence of a nation, and are then termed "fine arts." This term is at present held to include poetry, painting, music, sculpture, and architecture. To this list there is no just reason why we should not add photography, for, in whatever way we define the perfection which is understood as constituting the claim of any art to be called "fine," our art can show either that it has already such qualities, or that such qualities are within its reach, or that there is a very reasonable hope of such qualities being acquired. In either case there would exist no fair argument against its claim. Every branch of the fine arts were as much fine arts in the earlier stages of their progress as they now are—the utmost stage of perfection, or the absolutely highest state of progress, being yet unreached in either of the five arts I have named as fine. I therefore think such facts as are mere indications of the infantine state of photography should not be advanced as arguments against its rightful claim to so honourable a position.

To enforce this claim we must look to our practical operators. The evidence of the eye is better than that of the ear. One member of this valuable society in bringing forward a single production expressive of real artistic power, sentiment, and feeling, would find in its silent eloquence a more able pleader for the recognition of his art's high value than a whole army of such poor advocates as you now honour with your attention.

Believing this, I have always, when speaking of art in connexion with photography, endeavoured to give my remarks some *practical* value, confident that, in calling attention to the more simple or mechanical of pictorial principles, I should have the better chance of enlisting in the cause such allies as would do battle for it with their chemicals and apparatus, rather than with their pens or speeches. Not that I undervalue the æsthetical in art, or think feeling, imagination, or sentiment of less value to the photographer than to the painter; but because I know that the lesser must precede the greater—the seed the harvest. There are those who think the corn already ripe; but they are not many. There are others who believe the soil to be barren ground, in which such seed can never grow: these are more numerous. The fact is, the ground is new and strange, *has been neglected, and contains some weeds*, but only requires our operators, societies, and journals to put their hands to the plough already in the furrow.

There is plenty of art in the *mouths* of our photographers, but there is very little of it, as a rule, in their works—like Hood's poor fellow, who, with victuals always in his mouth, sadly wanted a belly-full. Loose talk about Art has never been a very scarce commodity, I'm afraid, but it has certainly always been a mischievous one. With no other aid than a good memory you may talk art or poetry by the hour; but to feel either you must do more—you must *understand it.* It is only those who feel art whose works display genuine pictorial excellence; and it is seldom indeed that any feel art who do not also understand it, even although they may be by no means eloquent in giving to such knowledge verbal expression. The popular estimation in which any new art is held will always be decided, not by a knowledge of its peculiar capabilities, but by the merits or demerits of its productions. This is especially the case with photography.

I have just been reading a series of remarks in some daily and weekly papers upon this year's Photographic Exhibition in London. Nearly all of them directly or indirectly denounce its claims as a fine art, and at the same time evince the most profound ignorance of its resources, powers, and improvements. To understand only one side of a question is said to be a good way of avoiding prejudice; but the critics I refer to possess such an advantage in a more eminent degree—*they understand neither.* For instance, the *Illustrated London News* says:—"Judging from the appearance of the various works produced, we should be inclined to conclude that the new art had reached its limits, leaving nothing farther of importance to be accomplished. As a rival [?] therefore of the fine arts its powers and resources may be considered as known qualities; and we are still of the opinion which we have always entertained that, as far as the estimation of the real lovers of art goes, the palette and easel have nothing to fear from camera and darkened room."

This critic has evidently made up his mind and delivered judgment without hearing a single witness.

Again, *The Times* tells us that "it is as well that the domain

where photography ends should be so sharply and certainly fenced off as it is from that where art begins;" and adds that "the proof of this separation is afforded by the conspicuous failure of all the photographers' attempts to make pictures."

Now, is not *this* a pretty piece of argument? My new cook, who took her place among my domestics without sufficient knowledge of the duties belonging to her office, spoils my dinner, and I tell the guests her failure is a proof that it is impossible to produce a properly cooked joint.

Now, whether we have to deal with critics who believe because they always did believe, or denounce because they don't and won't understand, your practical man's works are in either case the best arguments to advance against them. Prove to the public eye that photographs *are* pictures, and we thus enlist in our cause that mighty monarch called "popular opinion," before whom this cant of criticism will become hushed, and all these dogmatic censors bowed in humble deference. We cannot convince these critics, perhaps—for their closed eyes and stopped ears place them beyond the reach of evidence or argument—but we can deprive their oracular dogmatism of its influence by the exhibition of our successful results.

If they point out the flat, adhesive character of some hard, map-like landscape, produced by some mechanical operator, place before them another full of space and aërial effect, showing them that the superiority of the latter had its origin solely in the brain of the producer. If they deride pictures without roundness or relief, hard of edge, with harsh black patches for shadows, and the high lights swallowed up by masses of glaring white paper, show them others produced as before with equal appliances, in which the images are soft and round, with transparent shadows and beautifully delicate half-tones, gradating almost imperceptibly from the real high lights into the deeper tones and reflections of more retiring surfaces. They can't escape such arguments as these; and so the truth will ultimately triumph, and photography be raised in public estimation as an art in which, however easy as it is to do a little, only artistic feeling and artistic knowledge can secure artistic results.

They say it can't be done: *we* say it can. They speak in the thunder of the public press: we in the whisper of class journals and comparatively unknown societies. Our whisper, therefore, cannot compete with their thunder in addressing the public ear; *but our works can speak with even more force and effect than they can command to the public eye.* I therefore again repeat that it is to our practical men that we must look for the art's real upward and onward progress.

The new art has *not* reached its limits; and we, societies, know very well that there is something further to be accomplished. There is, indeed, *much* to be done, and that in every branch of the art. We require, and are grateful for, the labours of our opticians, our chemists, our mechanics, and our operators; but, above all, it is necessary that our artists should be active, inasmuch as theirs, the highest and most important branch of all, has been the most neglected. We do not want abstruse theories from any of them. Such things will do well enough when we have done our more necessary work; but now every paper we read, every experiment we undertake, and every discussion in which we take part, should have some practical value.

It is our task, then, to urge upon our practical members the cultivation and application of artistic taste and knowledge, that their works may assert publicly the lofty mission and high importance of the art they practise.

(To be continued.)

ON SOME OF THE CAUSES OF DISTORTION IN PHOTOGRAPHIC PORTRAITS.

By Joseph Sidebotham.

[Read at a Meeting of the Manchester Photographic Society, March 6, 1861.]

Every photographer, whether he be amateur or professional, who has taken many portraits, must be aware of the great difficulty of producing a satisfactory likeness: a bad sitter—a person who will move his features, or who purses up his mouth, or who appears as if awaiting his execution—or, what is perhaps still worse, has no expression whatever on his face—is one of the difficulties. A short focus lens endeavouring to take a large portrait is another. These, and other well-known circumstances, combine to furnish us with numerous photographic pictures, *not likenesses*—portraits that yield no credit either to art or the artist. Even among the productions of skilful photographers one often meets with portraits which are *not likenesses;* and making due allowance for bad sitters, there still appears to be something beyond which makes the portraits not exactly what they ought to be.

How often do we hear the remark—"the portrait makes you look too stout!" One great cause of this form of distortion is the practice of making the camera *look down* on the sitter, the photographer supposing that by this means the legs and hands will be brought into better focus: this has the effect of foreshortening the figure, and, consequently, making it appear stouter in proportion.

In copying a picture in the camera this distortion can be seen at once: the figure may be lengthened or shortened according as it is viewed in the same plane or at an angle.* This is a well-known fact to many of the best professional photographers, and they always make a point of having their camera placed horizontally.

There is still another matter for consideration, and one which has often been discussed, viz., the question whether large or small lenses are best suited for portraits—or perhaps it would be more correct to say large or small apertures. Sir David Brewster and others maintain that the correct aperture with which to take a portrait should be a very small one—as small, if possible, as the pupil of the human eye; others contend that a lens, or combination, of large aperture should be adopted, not only as increasing the rapidity of action, but as also giving greater roundness and prominence to the portrait.

FIG. 1. FIG. 2. FIG. 3. FIG. 4.

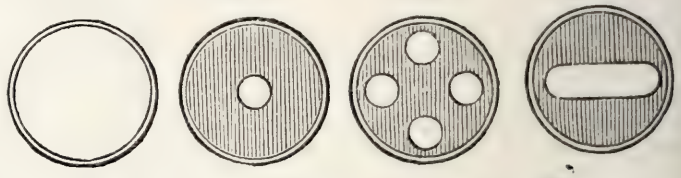
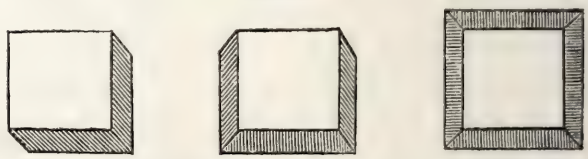


FIG. 5. FIG. 6: FIG. 7



Let us examine portraits taken under both these conditions; and, first, that taken with the small aperture *(fig. 2)*. You can find no positive fault with it; but there is a flatness about it, and you perceive at once that it is not satisfactory. It is in fact like looking at your friend's face with one eye, and to a person who is unfortunately furnished with but one would no doubt be pronounced an admirable likeness. Look at portraits taken with a lens of large aperture *(fig. 1)*. They have not the fault of being flat, but stand out extremely well. Still the features do not appear correct: there is evidently *distortion*, although we cannot exactly find out *where* it exists.

It would appear, then, that neither the small aperture or the large one give accurate portraits; in fact, neither looking at a friend with one eye or looking at him with a number of eyes, arranged in a circle of three inches in diameter *(fig. 3)*, would give us the same result as we have by looking at him with two eyes.

If we take a small cube, of an inch in diameter, and take a photograph of it, using a small aperture—or, what is the same thing, look at it with one eye—we are able to place it it so as to see three of its sides *(fig. 5)*. If we use a large aperture lens, we can so place it as to take a picture showing five sides *(fig. 7)*; but if we look at it with both eyes, we can only see four sides *(fig. 6)*—viz., small aperture, three sides; large aperture, five sides; both eyes, four sides.

Let us now see if this does not assist us in solving the problem. To depict the portrait on a flat surface, as seen from a single point, the small aperture is no doubt correct. But we want a *likeness*. We do not care for the mathematical precision. We want a picture of our friend's features as they appear to us.

To take a portrait so as to give the likeness the same as we see with both eyes, we ought theoretically to use a diaphragm with two small openings, one at each margin of a three-inch lens, arranged horizontally like the eyes. In practice this does not answer, as the two apertures yield dissimilar pictures, which, although falling on each other, do not blend together to form one image. But we can produce a modification of this, which removes the difficulty, and it appears to me this is exactly what we require.

My plan is to use a diaphragm of the form of *fig. 4*, giving the extreme limits of the vision of each eye in a horizontal direction, and entirely cutting off what we may term the *vertical* stereoscopic effect, which is the cause of so many unpleasing portraits. We get the roundness of figure as in the large lens portrait, we reduce

* Large portraits were exhibited—copies of the same picture, viewed correctly, and also at angles vertically and horizontally, showing the different forms of distortion.

the amount of distortion to a minimum, and we get copies of our friends' faces as we see them. The two eyes, although fixed in position, do not each look at one side of the face, but, as it were, wander across it horizontally. So this form of diaphragm appears to imitate as nearly as can be this effect, and to produce for us what we all wish for—a perfect photographic portrait.

Since writing the above I have seen an abstract of a paper by Sir David Brewster on the same subject, published in THE BRITISH JOURNAL OF PHOTOGRAPHY; but, although Sir David notices the distortion produced by large lenses, he still advocates the use of small lenses, which appear to me quite as wrong in the other direction.

ON THE TESTING OF SILVER BATH METERS.

By GEORGE DAWSON.

[Read at a meeting of the North London Photographic Association, February 27, 1861.]

I HAD intended to have made some remarks on the extraordinary paper of Mr. John Cramb, of Glasgow; but, as Mr. Hughes himself has taken up the cudgels, I cannot leave them in better hands. I will now, therefore, only refer to some experiments I have been making, to help to clear away the doubts which, at the last meeting, I expressed after the reading of Mr. Hughes's excellent practical paper, whether the hydrometer test could give even an approximate estimate of the quantity of nitrate of silver present in a very old paper-exciting bath. Theoretically, the large amount of other nitrates arising from the double decomposition must necessarily accumulate to such an extent as to render the hydrometer test useless. Mr. Hughes replied that such an accumulation did not practically take place, except to a very limited extent. With the view, then, of satisfying my own mind on this point, I have, since the last meeting, made a careful analysis of several old baths, two examples of which I will read from my laboratory memoranda. I selected these two because the baths were very old, made and kept up by pure nitrate of silver, only used by myself, and gave a fair average result of the whole.

ANALYSIS OF OLD POSITIVE PAPER BATH.

History.—About ten months old; originally three quarts of ninety-grain solution; kaolin sufficient to discharge the colour as it formed in the stock-bottle. After each occasion of use, the flat exciting and the drop-catching dishes were rinsed out with two ounces of distilled water, which were added to the stock-bottle along with 240 or more grains nitrate of silver, according to the number of papers excited: the original solution now reduced to about one quart.

At	60°	Fah. S. G.	= 1·152	indicating about	83	grs. nit. sil. to fl. oz.
„	80°	„ „	= 1·148	„	81	„ „
„	90°	„ „	= 1·146	„	80	„ „
„	120°	„ „	= 1·140	„	78	„ „
„	140°	„ „	= 1·136	„	76	„ „

The ratio of decrease of Sp. Gr. by increased temperature I have no doubt, if this experiment had been performed accurately, would have been found perfectly uniform. As to the grains of nitrate of silver appended to each I have some doubt—in fact, they were only approximate.

At 60° one fluid ounce of this solution, precipitated by pure hydrochloric acid, yielded 67·2 grains chloride of silver, equivalent to 79·6 grains nitrate of silver.

The filtered liquor on evaporation, and after all the nitric and excess of hydrochloric acid had been expelled, left 7·6 grains of residue, consisting of 5·2 grains soluble nitrate, and 2·4 grains organic matter, apparently combined with carbonic acid, from its being expelled readily by any stronger acid without the application of heat. The compositions of this substance I did not examine further. This amount of chloride and residue of evaporated liquid was the mean of three analyses, which varied no more than one-fifth of a grain. The organic matter was the mean of two.

A test solution of 66 grains pure dried chloride of sodium in 24 ounces distilled water always showed precisely 80 grains to the ounce. The slight discrepancy between the more tedious and exact process of precipitation of chloride of silver by pure hydrochloric acid and the modification of Gay Lussac's method arose, no doubt, from the difficulty of expelling the water completely from the salt, and the impracticability of measuring precisely 24 ounces of water from any glass measure usually employed. From the large quantity of nitrate of silver added to this bath, and from its frequent use, I should certainly have expected to find a very much larger proportion of nitrates different from that of silver. The equivalent of nitrate of soda being 84·97 (say 85), it follows that, for every two grains of nitrate of silver abstracted by decomposition, one grain of the former ought to be left in the bath. In the above case, certainly, and in some other baths I have tried—but whose history I do not so well know, nor whether they were prepared with *pure nitrate of silver*—this accumulation of nitrate of soda and ammonia did not take place in any way commensurate with the quantity we ought to expect. Although these nitrates must inevitably be formed, they are partly retained and taken away by the paper in a way which I am at a loss to account for.

ANALYSIS OF OLD COLLODION BATH.

History.—This bath was made about the beginning of June, 1860; strength, 35 grains to the ounce; 40 ounces made up, the bath holding about 18 ounces; used occasionally during that month, almost daily during July, and pretty frequently since; it has travelled and been knocked about in Scotland; yielded upwards of 200 stereoscopic negatives; and lain for four months in a warm room in an open gutta-percha bath. No water has been added, but a few crystals of nitrate of silver occasionally, as it seemed to require them.

At 60° Fah. S.G. 1·050 = about 26 grs. nit. to fl. oz.

Analysis by hydrochloric acid gave 26·5 grains chloride, corresponding to 31·39 grains nitrate of silver to fluid ounce.

The evaporated liquor yielded—

Soluble nitrates ....3·2 grains.
Organic matter..... ·9 „

These experiments, I admit, did not settle the general question in dispute, but certainly they led me to pause before passing a sweeping condemnation on the specific gravity test for practical purposes from purely theoretical reasons. In so far as relates to the few baths I have examined, it always gave a considerably under-estimate for the collodion, and slightly over for positive-paper baths. But of course a great deal depended on the purity of the silver originally employed.

ART-PHOTOGRAPHY.

By J. T. BROWN, JUN.

[Read at a Meeting of the Birmingham Photographic Society, on February 26th, 1861.]

ART-PHOTOGRAPHY has very recently been prominently brought before the photographic public by the admirable paper of Mr. Hughes, read before the South London Photographic Society, and commented upon by nearly every journal connected with the art. I have taken the matter up at this late period of the discussion with reluctance; but, having given much study to the subject of *Art-Photography*, I wish to make a few remarks. I cannot believe that in this controversy our friends, Messrs. Rejlander and Robinson, as the chief exponents of what is called "Composition Photography," have been fairly dealt with; but it is not requisite I should raise my voice in their defence, feeling confident that their *works* will remain a lasting and sufficient reply to their would-be detractors.

We have read very much lately about "mechanical" or (as Mr. Hughes more justly terms it) "literal" photography, "art" and "high-art" photography; but I must confess the distinction to be almost too subtle, more especially judging by Mr. Hughes's own axiom that "*he is the higher artist who produces the greatest results with the smallest means.*"

Before entering upon the question of Literal or Art-Photography, I will explain my views of Art, which, summed up in a few words, consist of a *faithful* translation of the beauty and poetry of Nature, as rendered to the perception of the human mind through the medium of the sense of vision; and, whether embodied upon canvas by the "artist" proper, by the mechanical aids at his command, or by the "artist-photographer" upon a chemically-prepared plate, with much less mechanical labour, through the means at his disposal, yet both are dependent upon extraneous assistance —"mechanical"—whether manipulatory or otherwise.

If we take the whole scope of modern painting, and apply Mr. Hughes's test, we shall be compelled to award the palm of greatest excellence to Turner and David Cox, as in their works they have achieved stupendous results with an outlay of mechanical means marvellously small; while the followers of the pre-Raffaelite school—who have, I believe, by a strict and judicious attention to the productions of photography, tended in a great degree to promote a higher interest in their profession than artists generally were prepared to admit—would, from the extensive manipulation upon their

pictures, be degraded to the lowest position. This would obviously be unfair. While I cannot but admit the productions of Turner or Cox to be the result of a most intimate knowledge of the mechanical means at their command, combined with an aptitude for converting that knowledge to its proper and natural use, I cannot overlook the fact that the study required by the observer to fully comprehend the subject matter of the picture more than compensates for the extra labour or outlay of mechanical means that would have been required to render its intention more clearly expressive. In the pre-Raffaelite school the opposite extreme has been adopted, and I believe no man can look upon the wonderful manipulation of most of that class of paintings without regretting that so much valuable time has been wasted by the artist that might have been turned to better account. In this particular photography will ultimately take the place of painting.

I have here a stereograph of a bit of Nature, *Ferns and Blackberry Brambles.* No doubt Millais would not think such a gem beneath his pencil, though the time required to perfect by the means at the artist's disposal a finished picture of this bit of Nature would form an insuperable bar to its application. But the artist-photographer, provided with his camera and prepared plate, may perform in a few seconds what to the artist would be a labour of months. And how much more correctly! Colour only would be wanting; and in this, the most important item, photography is at fault. While we can render the *chiaroscuro* of Nature—and the artist-photographer must pay more attention to his *lights* and *shades* than the artist of the pencil is necessitated to do, as upon them and not upon *colour* the effects of photography depend—still I am not without hope that we may, by a more careful analysis of the photogenic power of colour, chemically applied, remove this difficulty and place photography in a still higher position than it has yet aspired to.

I have also a set of stereographs—*Views upon the Avon*—taken during the recent frost by one of our members, Mr. Burr, which, although *literal* photography only in its lowest form, still shows that the appreciative powers of the artist have been employed, not only in the selection of the views themselves, but in the application of the art to copy the eccentricities of Nature therein displayed, as a memento of a scene which, for poetical beauty, has seldom been equalled. They also exhibit the superior powers of the artist-photographer over the artist. Had the latter wished to depict the sublimity of the scene, he would have utterly failed from the amount of *time* required to perfect—even were such perfection possible in human hands—a transcript of the view before him; but the former, by a simple movement of the cap of the lens, so as to expose for a few seconds his prepared film to the photogenic influence, receives an impression perfect in all its details, and still more perfect when viewed stereoscopically.

I am therefore disposed to class these productions among those of art-photography; but would with all deference throw out the hint, not only to the operator in this but in other cases, that when the poetical sublimity of Nature is aimed at it would be well to dispense with the introduction of *figures*, which generally appear to be posed for that particular operation, and, to the educated eye of the artist, mar the effect.

I have described Art as being a *faithful* transcript of Nature. This faithfulness in photography has hitherto been unattainable, from the variation of the photogenic powers of the different *colours* composing a landscape or other natural object operating so variously upon the chemicals employed; and it is in this particular that I think the works of the *composition*-photographers—if I may use the term "composition"—have been underrated. With all the chemical and mechanical means at his disposal, the artist-photographer has not been able to avail himself of the evanescent forms of Beauty to the extent he would wish to have done. While some important object in the landscape or view, to which he has directed his camera, may require several seconds—for I will speak of an instantaneous process—to impress itself in all its detail upon the film, other parts are considerably overdone. And the sky! Would that artist-photographers could, like the artist, not perhaps select their *sky*, but be allowed to suit a sky to the requirements of their picture!—if *sky* in most photographic pictures be an essential (which I have yet to be convinced of): or what should be the sky, a complete blot. I maintain—and I think justly—that the artist-photographer, having met with a scene, and a sky which, in his judgment, is suited to that scene (and such is seldom to be met with), would be fully justified in translating the cloud or sky, as it might be, to one plate and the landscape to another. The evanescent beauties of the one might be preserved intact, and a better opportunity would be afforded to obtain *detail* of the view. Mr. Hughes states that landscapes *may* be taken with their natural *sky*—granted, in some not in all cases—and he gives the fact that Mr. Kibble, of Glasgow, has succeeded in taking an enormously large picture with the sky and water and a steam vessel all perfect, and on a *dry plate.* He quotes this as showing that the hopes of obtaining natural skies are by no means desperate. But I ask is such a picture—*Art?* I say it is *mechanical* photography, neither more nor less. It may be that the feeling of the artist has been displayed in availing himself of the precise moment when *sky, water,* and *vessel* were artistically arranged; but such is farther removed from *Art* than the composition-photographers' works Mr. Hughes alludes to.

Again, Mr. Hughes cannot undertake to say that the *natural sky* is at all times that best suited to the picture. From some peculiarity of *tone* in the distance, the foreground, or the principal object in the view, operating upon the chemically-prepared film in a manner far differently to the photographic effect upon the visual organ of the artist, a want of harmony would be produced; and, unless the artist-photographer has been educated to a due appreciation of the photogenic effects of colour upon the chemicals he is *generally* in the habit of using, it is almost impossible, unless in rare instances, for him to produce upon a single plate the natural harmony of the scene.

I would, with Mr. Hughes, if possible, dispense with "composition-printing;" but at present such is a necessity, and, therefore, a legitimate vehicle for expressing the artist's conception of Beauty.

But, not only does the art of photography require further culture—whether in in its optical, chemical, or mechanical departments—we must, to render photography an art, educate our operators to their profession. A photographer may take a portrait or a view which shall exhibit a large amount of artistic feeling on his part; but, if he had received an artistic education—if he had studied the *chiaroscuro* of nature apart from photography—I maintain, with Rejlander and others, that he could not produce a picture wanting in artistic feeling. But, while he applies all his energies to art, he must not forget science. However artistic a man may be, he will often be foiled by apparent failures which might have been overcome had he been "up" in his chemistry or optics; but in these matters I am infringing upon the position of men better qualified than myself to give explanation.

Mr. Wilson, of Aberdeen, in a letter to one of the journals, "states his conviction that *vision* is a photographic operation, and that before we can see an object, it is necessary that it should be photographed in *colours* upon the retina. The optic nerve may be very sensitive, but not so sensitive as to feel a mere shadow." I have long indulged in a similar belief, as explained to the members of this Society in connexion with an impression I have, that we may so educate our vision as to reclothe the rays from a practically colourless photograph as they strike the retina with many, if not all, the pristine colours of the view or object represented. I have not in the limits of this paper an opportunity to explain my reasons; but I feel satisfied such a result can be, and is often, partially attained, whether from the force of contrast, variety in depth of tone, or other cause. Colour blindness has been clearly demonstrated, and the loss of such a perception would justify my belief in the theory.

I am happy that our Society numbers a Rejlander, a Robinson, and a Norris—and united with us, also, a Hardwich; and I hope every member will use unwearied exertion to maintain the Society in the proud position it occupies in having such men connected with, and I may say working members of, it.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

No. II.

INSTANTANEOUS SHUTTERS.

As the time is at hand when photographers will be making their arrangements for field-work, I purpose devoting the present paper to a description of the various methods which have been adopted for giving short exposures to the sensitive film, so as to produce the *so-called* instantaneous pictures; for, although these inventions have frequently been referred to at the various meetings of Societies, no detailed description of their construction has hitherto been published.

The various contrivances may be classed under four groups—viz., those that cap the lens with a motion similar to the opening and shutting of a book-cover; those that open and close the lens with a plate moving perpendicularly or horizontally in front of it;

those that close the aperture by a diagonal sweep across the lens; and those that open at the centre of the lens.

It may be premised, however, that some operators eschew all mechanical appliances for the purpose. Thus, Mr. Wilson exposes and closes his lenses with his Glengarry cap, whilst Mr. Hardwich recommends the simple plan of hanging a piece of black cloth before the apertures.

GROUP I.

Shutters belonging to this type are placed either in front of the lens or behind it, thus:—

MR. S. FRY'S ARRANGEMENT consists of a light mahogany slab, screwed on to a round rod of wood, one end of which fixes on to a pin fixed inside the camera, and the other end of the rod, which is capped with a brass ferrule, passes through a light-tight aperture on the opposite side of the camera: a milled head screws into the ferrule, so as to afford a means of rotating the rod upon its axis—the position of the shutter in relation to the lens is shown at A, *fig.* 1. The slab fits *close* against the lens, so as to exclude all light from the camera; but, by a rapid movement of the hand, the rod is rotated backwards, downwards, and then forwards, so that, at the will of the operator, an exposure of greater or less duration can be given.

This contrivance is both simple and efficient, and has the advantage of giving the sky the *minimum* and the foreground the *maximum* of exposure.

MR. ROUCH'S METHOD is on the same plan as that just described. It consists of a box with a lid hinged to it, placed behind the lens, *within* the camera. The lid or shutter is kept *up* or pulled down for the exposure by means of a cord passing round a pulley, fixed to the side of the shutter-box, and then through the back of the camera; but this is obviously not such a good arrangement as the preceding.

FIG. 1.

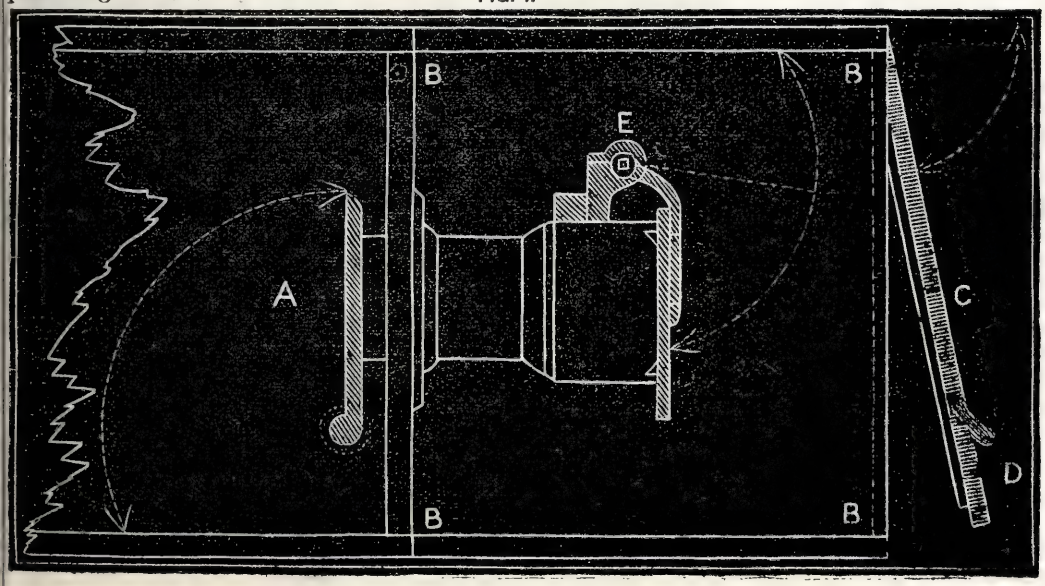
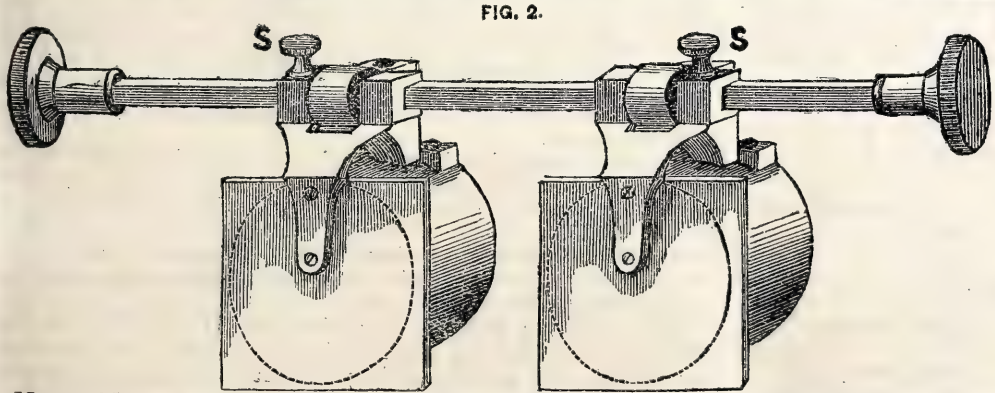


FIG. 2.



MESSRS. MURRAY AND HEATH extend the woodwork of the camera *in front* of the lens or lenses (*fig.* 1 B), so as to form a sun-shade; whilst a close-fitting door C, hinged to the top of this portion of their camera, is raised or closed by aid of a little handle D, fixed about one-third from the end of the shutter. This contrivance places at the disposal of the operator the means of giving a long or short exposure, as circumstances may dictate; and when the shutter is raised, it further shields the lenses from the glare of the sky—an arrangement recommended by many of our best photographers. If a very rapid action is desired, an india-rubber band is fixed on to a pin on the side of the camera, and then over the handle D; and when the shutter is sufficiently raised, the handle is allowed to slip from between the fingers, to allow of the full reaction of the spring.

MR. DALLMEYER adopts two modifications of this type. If the lenses are fixed at a certain distance apart, a thick block of wood, pierced with two apertures, fits over the brass shades of the lenses: a thin slab of wood, with overlapping sides, attached to an axis furnished with a milled head at each extremity, is hinged to the *upper* side of this block. By means of one of the milled heads, the lens cover or shutter is rotated *upwards* and downwards with any desired degree of rapidity, and in a manner to meet all the requirements of the photographer. The action is indicated at E, *fig.* 1.

If, on the other hand, the lenses are mounted on the front of the camera so that they can be separated, to meet this arrangement Mr. Dallmeyer adopts the following contrivance:—On to the shade of each lens a separate cap fits, to the upper side of which a metal shutter is hinged in the manner shown at E, *fig.* 1. Through the centre of the hinge of each shutter a square rod passes, as shown in *fig.* 2. Thus each shutter is freely adjustable on a common axis; and when the lenses have been sufficiently separated, according to the wishes of the operator when focussing a view, it is only necessary to clamp each shutter on to the bar by means of the screws S S, *fig.* 2. On turning either of the milled heads, both shutters may be simultaneously raised or depressed.

Both in Messrs. Murray and Heath's and Mr. Dallmeyer's arrangements it will be seen that the maximum of exposure is given to the foreground and the minimum to the sky—as the shutter turns *upwards in front* of the lenses. *(To be continued.)*

ON A NEW PLATE-HOLDER.

By — NOTON.

[Read at a Meeting of the Manchester Photographic Society, March 6, 1861.]

MY method relates to the albumen process, in which it is necessary to "spin" the plate. The ordinary method of effecting this is to attach the plate to a piece of heated gutta percha, an operation often inconvenient, and attended with danger of breakage, the plate being as it were cemented to the holder. I may here mention the fact that, upon detaching a plate from a holder of this description, I have frequently observed a luminous ring upon the gutta percha.

I will now describe the particulars of the construction of the new plate-holder:—A tube of metal, about fifteen inches in length, is provided at one end with a disc of India-rubber, such as is ordinarily attached to pneumatic holders, the central part of which disc is open to the interior of the tube. This tube is provided with an enlarged cylinder, about two inches in diameter, within which is a small air pump, which can be worked by a rod passing along the tube. Above the before-mentioned cylinder is a cock, which, upon being turned the one way or the other, opens or closes the cylinder to the aperture in the India-rubber disc. In using the apparatus the cock is so turned as to cause it to close, and the pump being then put in motion a partial vacuum is formed. The plate is now placed on the India-rubber, and is subjected to the vacuum by turning the cock, so as to open a communication between the space beneath it and the cylinder in which the air pump is placed, and it will thus be held secure. When necessary to release the plate the cock is again turned, and air admitted beneath it, to provide for its easy removal; but this turning of the cock does not destroy the partial vacuum within the cylinder, which is still capable of acting as already described—the air necessary for the release of the plate being admitted through another aperture, the arrangement of which is similar to that in use for indicators of steam engines.

ON A SENSITIVE DRY COLLODION PROCESS.

By M. Mc-A. Gaudin.

(Continued from page 65.)

There will be then no analogy of treatment when images on paper, albumen, or iodised collodion, are submitted to the emanations of bromine or chlorine; and these three last preparations have the great advantage of being susceptible of forming, with silver, a whole series of combinations. Silver itself is at first only slowly attacked by iodine: by beginning with bromine or chlorine we scarcely succeed at all, and if we wished to apply cyanogen that would prove almost impracticable.

In the paper, albumen, or collodion processes we can, in the first place, introduce either cyanide, chloride, and bromide, as well as iodide: upon cyanide we can cause iodine, chlorine, or bromine to act; upon iodide, chlorine or bromine; upon chloride, iodine or bromine; and at last upon bromide, iodine, or chlorine, without our being able in the least to foresee the results: in my opinion this method is fraught with promise.

Here is, however, the opposite side of the question. I cannot imagine that many other photographers have not been struck with the same idea, which may have been followed up by experiments; which experiments having proved completely unsuccessful, no mention has ever been made of them. I mean that in reasoning upon the analogy between the iodide of silver of the daguerreotype plates and that of other supporters, we shall find that the last have an unfavourable aspect. With silver, as I have already said, there necessarily takes place a phenomenon of affinity which produces on the surface of the plate a coating of iodide, bromide, &c., of an indefinite thickness, by means of the substratum of silver which is ever ready to enter into combination; with a previously existing iodide, which does not possess a particle of metal in excess, we can only lead to a compound rich in the mineralising element, iodine, bromine, &c.; and, according to theory, such a compound ought to require a greater luminous action to compete with the deposit formed upon metallic silver, so that it might well happen that this process, when put into practice, should produce an effect quite the reverse to the one expected, that is to say, one of less sensitiveness; but it would probably become a means of preservation for sensitised papers and plates.

Indeed, in the case wherein a sheet of sensitised paper or glass, even after a careful washing, should still preserve some free nitrate of silver, the first effect of iodine, bromine, or chlorine, would be to form an iodide, a bromide, or chloride with disengagement of oxygen, and the release of an equivalent of nitric acid; consequently, the complete destruction of the nitrate in excess, and the release of volatile substances which would immediately disappear.

That being granted, this is how one might operate after having sensitised and washed as perfectly as possible some sheets of paper, or albumenised or collodionised plates, and dried them:—Operate with a stereoscopic instrument having two objectives; one side of the plate only should be submitted to treatment, so that a comparison of the two sides will immediately give the result of the experiment.

In my opinion, the process would be applicable to the preservation of paper only, considering the great force of absorption of this support; and for sensitised plates we ought to allow the mineralising vapour to act but for a very short time, as we have no means of judging at sight of the molecular change which has taken place.

Such are the suggestions which I have thought fit to make, in order to provoke experiments, which I also intend to prosecute upon insoluble compounds, other than those which I have indicated.—*La Lumière.*

*** In the first portion of this article the word "process" was accidentally omitted after the word "Daguerreotype," in the last line but one; page 65.

STEREOGRAPHS.

Abbeys, Castles, and Cathedrals of Great Britain.

[*Illustrated by* W. Woodward, Nottingham.]

On turning over the series before us, the first picture we come to is identical with that first noticed in our issue for 15th February of the present year, as regards the subject, and taken nearly from the same point of view. We allude to The Cloisters at Fountains Abbey, No. 204; but, as we have so recently described the scene, it is unnecessary to repeat it. We may, however, remark that Mr. Woodward's negative was taken by the collodio-albumen process, and we are informed that this subject being very dark entailed the lengthened exposure of one hour. We are somewhat surprised to find that, contrary to what might have been expected, the outlines of the shadows are sharp and distinct in spite of the change of 15° in direction which of course they must have undergone.

Mr. Woodward has made more pilgrimages than one to Fountains Abbey, and it will probably be in the recollection of some of our readers that we have noticed in previous volumes some of his productions from this locality. We find that here and there he has issued a second edition of a former subject, and generally an improved one, notwithstanding the very unfavourable weather during the past season: in a few instances, though rare ones, he has had the worst of the contest. Amongst the improved editions of the Fountains Abbey illustrations is No. 198, The North Aisle, *looking East.* Of the new ones there are two nearly identical, both numbered 201, and entitled Bridge over the River Skell. Both of them are excellent illustrations of a picturesque subject, and the position of the camera appears to have been altered after taking one negative, but to a very small extent; yet it has not been done without material improvement—that containing a trifle more of the subject towards the right of the operator being in our judgment considerably the best. We know not whether or no this is the same bridge which figured in one of Mr. Ogle's series: it is by no means improbable, although there is not the slightest resemblance between Mr. Woodward's and Mr. Ogle's illustrations, except in name. In the latter the bridge formed but a very insignificant item in the "theme:" in the former it is a prominent object, and the water is beautifully transparent, while the banks of the river, bridge, trees, ruins, bushes, &c., receding from the observer in successive planes, one behind another, cause this to be an effective slide as well as a highly pleasing picture. There is one little fault in this as in some others of Mr. Woodward's otherwise excellent productions, and it is one for which we have before had a quarrel in a quiet way: he will use a single instead of a bi-lens camera, and it is consequently impossible always to prevent this being perceived by slight difference in the illumination of the members of the pair of pictures, though Mr. Woodward frequently manages it cleverly.

No. 199, View from a Window in the Cloisters, *Fountains Abbey,* is a very charming subject, whether for the stereoscope or a larger picture: the disjointed portions of the ruined walls appear to be literally crushed under the luxuriant mantle of ivy, while a grove of fine trees forms a fitting background.

No. 175, Bolton Abbey, *from the South-West,* is taken from an admirably-selected point of view, and the pair of noble old trees in the foreground, leafless as they are, add materially to the artistic value of the subject.

There are two pictures from Easby Abbey, the negatives of which were exposed during the rain as we are informed, though, beyond the absence of sunshine, they exhibit no symptoms whereby we could have inferred this extra difficulty in operating. No. 181 is a View from the Churchyard, and No. 182 A peep through the Refectory Window, and a very pleasant peep it is we must admit.

Of Rivaulx Abbey we have three different views in the Choir—all excellent. No. 192, The West of the Choir Side, *looking South,* is perhaps the most pleasing as a picture, owing to its containing more variety of incidents than the others, and being more broken up in detail; but, when viewed in the stereoscope, No. 193, The Choir looking South, *from the Inside,* is particularly charming, the row of columns and arches on the left being adorned with the chequered light from the corresponding openings on the opposite side. We may safely predict an extensive demand for these beautiful specimens.

Tintern Abbey has long been known as a favourite resort to the artist, and of late years to his brother of the camera. In some few of the numerous illustrations of the locality now before us, we do not think that Mr. Woodward has attained to his usual standard of excellence—no doubt owing to his having been afflicted with the malefic influence of continuously bad weather—while in others he has been particularly felicitous.

No. 220, South Aisle, *looking West,* and 217, The Nave, *looking East,* are both charming semi-interiors. No. 218, The Nave, *looking West,* is only a little inferior; but 219 is a trifle too chalky in appearance.

There are three of the slides presenting a general view of the abbey; and of these we prefer No. 207, View from the Chapel Hill. There is, however, an absence of sunshine, which would materially have improved the landscape; and the high wooded hills in the background present rather too hard and cutting a line against the sky, that is destructive of atmospheric effect. In No. 210, View from the South-East, the distant hills are beautifully mellowed

down; but a tree on the left in the foreground is far too dark, and the foliage having been in motion is indistinct and unsatisfactory. The abbey itself, also, is a little too "dreamy" for a photographer, so that we fancy a rather large aperture was employed for the lens when taking this picture.

No. 211, THE SOUTH TRANSEPT, and 212, THE WEST END, are both extremely well-executed specimens of Mr. Woodward's work, the last-named being almost identical in subject with a large proof by Mr. Bedford, which formed the presentation photograph of the North London Photographic Association last year.

Amongst the illustrations of LICHFIELD CATHEDRAL there are three that merit especial notice, viz., Nos. 235, 236, and 237, being all representations of THE WEST FRONT or portions thereof. In No. 236 the whole front is included with the exception of the topmost portion of the spires, and the effect of the rich gothic style is well displayed. No. 235 is a somewhat nearer view, and of course includes but a smaller portion of the subject executed on the larger scale: it enables the observer to examine closely and particularly the five-and-twenty figures occupying the series of arched compartments extending entirely across the front. No. 237 is specially devoted to the magnificent WEST DOOR, rich in carving and chaste in design, the subject being similar to one delineated by Mr. Bourne on a larger scale, and which is to be seen at the Photographic Society's Exhibition, now open in Pall Mall. Our architectural friends must not omit procuring these.

RAGLAN CASTLE has found so many worshippers that we had come to the conclusion that it would be impossible to present it from any new point of view, but we were mistaken. No. 226, A VIEW FROM THE WALLS, we have not before seen; nor yet 225, VIEW IN FOUNTAIN COURT—both of which are pleasing studies. In the latter the blossom on the elder-tree fixes unmistakeably the period of the year when the picture was taken. No. 223, VIEW FROM THE MOAT, though perhaps the most picturesque, has suffered a little from slight over-development of the negative: the transparency of the water which is in shadow is beautifully retained, but the leaves of the ivy on the stem of the tree to the left are rather chalky. This is a favourite view with most operators.

Henry Martin's Tower, CHEPSTOW CASTLE, No. 230, is one of last year's successful achievements, and is a pleasing subject.

There are two capital slides of HELMSLEY CASTLE:—No. 184, THE GATEWAY AND BARBICAN; and No. 185, VIEW FROM THE INNER MOAT. It is evident that both of these were taken in the early spring time of the year, for the buds on the trees are just beginning to burst into leaf. In the latter the young leaves of the elm on the left contrast beautifully with the tufts formed by the half-opened ends of the ash on the right; and through a vista between the branches the upper part of the tower of the castle forms a fitting central point, around which a very charming composition is grouped. The execution is perhaps a trifle harder than might have been desired; but, if not faultless, the picture is still an excellent one.

In conclusion, we must express our gratification at finding that the season, so trying to all photographers, has not proved altogether barren of results to Mr. Woodward; and we cannot but entertain the conviction that, should the forthcoming season be only equal to the average of former years, he will add fresh laurels to those already earned.

REPLY TO THE "REMARKS" OF MR. HUGHES, MR. SIMPSON, AND OTHERS, ON THE PAPER "ON THE TESTING OF USED SILVER BATHS AND THE HYDROMETER SILVER METER."

By JOHN CRAMB.

As the City of Glasgow and West of Scotland Photographic Society has appointed a committee to investigate and report fully on this subject, it will be quite unnecessary for me to enter on the main question further than so far as I have, unfortunately, got personally mixed up with it, which, of course, will not be considered to come within the province of that committee's investigations.

It may be necessary to explain why I choose to answer Mr. Simpson through the columns of THE BRITISH JOURNAL OF PHOTOGRAPHY, seeing that his comments on my paper appeared *intact* only in the *Photographic News*. I do so for three reasons: Firstly, I wish one reply to finish the question, so far as I am personally concerned; secondly, because *my paper appeared alone in full* in THE BRITISH JOURNAL OF PHOTOGRAPHY; and, thirdly, because it was so cut down in the *News* as to be quite unintelligible. Being determined to avoid the very appearance of offensive language, I simply say my paper was so briefly given in that publication as to be quite unintelligible, and, therefore, I had no approach to fair play with the readers of that journal.

I understand, from the report of the meeting of the North London Photographic Society, that I am generally charged with manifesting bad feeling in my paper; and both Mr. Hughes and Mr. Simpson pointedly make that charge against me. I may have been unfortunate in my manner of expression, if such is a legitimate interpretation of the language used by me; but I emphatically declare that nothing was further from my thoughts than any approach to personal feeling of any kind. I repudiate such, even now, though I cannot but feel hurt at being called such hard names as "Provincial Cynic," "Bombastes Furioso," &c., and being counselled to acquire the "habits of a gentleman," and not to give way to "ebullitions of jaundiced and splenetic feeling." Perhaps the first impulse would prompt one to return these not over-complimentary phrases in kind; but I shall avoid this. I had supposed it were possible to be both bold and pointed in exposing error without being open to a charge of personal ill-feeling. The polemical region of intellectual labour I knew was no bed of roses; but I did not think it necessarily produced poisonous plants, or deadly and sickening exhalations. Thorns and thistles I knew were in my path, and their sting might be sharp. A good swordsman meets his antagonist by skilful fence and guard, but does not charge an honourable opponent with bearing a poisoned blade. I had no purpose in writing the paper on the subject of *Silver Meters* other than to aid the exposition and advancement of truth; and if, in doing so, I have spoken of what seemed to me to be errors on the part of my opponents with such severity as can fairly be construed into a manifestation of *malus animus*, then I can but say I never intended so to express myself, and I am sorry I have been misunderstood. I still, however, am quite unable to find in my paper any just cause of complaint on this head; and I think both of my opponents would have better served the cause of truth by distinctly pointing to the passages in which I had violated the "amenities of photographic discussion," than by fulminating offensive epithets at my head. That has not been done. Mr. Hughes, particularly, deals alone in general denunciations of the tone pervading my communication. I shall not characterise his proceeding, but prefer to leave it to the readers of this Journal and to Mr. Hughes's own sense of right and wrong.

Permit me now to refer in detail to a few points in those communications. It is said, in the article quoted, that I call so and so "*one* of the known principles of chemical and hydrostatical science." There is no such language in my paper. I only mention chemical and hydrostatical science once, and certainly not as the writer reports me. Again, he says my experiments are too contradictory to base a theory upon. I set up no theory, and consequently require no base. But, even if I had, how many contradictions do the authors point out? *One!* And though he does not state his meaning very clearly, I understand him to say that I had set forth the idea that the accumulation of heavy matter, not silver, in the printing silver bath went on in a regular ratio as the bath was used. I never said so. I never meant so; because I had not a sufficient number of facts before me to form any opinion on the question. *But Mr. Simpson supposes this must be so;* and, because one fact in my table of results goes against such a conclusion, that gentleman must needs say my results are too contradictory to base a theory upon, and that one fact in my table which goes against *his* theory shows all my unimpugned results to be contradictory. The setting up of a theory immediately on the back of every observation is not necessary, and indicates the tyro in philosophic investigation.

Again, I am supposed to deny that the paper *may* retain a considerable portion of the nitrate of soda, &c.; and in the article under review, I am referred to the difficulty of washing out *all* the hyposulphite of soda in ordinary printing operations. I never said *all* the nitrate of soda formed by double decomposition would be left in the silver bath. I did not mean so: I did not mean to say how much. Mr. Simpson concedes all I ever argued for: he allows that nitrate of soda, &c., will be dissolved into the printing silver bath. This is all I ever claimed. The only difference between us is, how much there *generally* is, and how much may be expected in ordinary working. I *know* there is an important difference in the amount of nitrate of soda that will be left in the bath, if we leave the sheet a long or a short time on the sensitising bath, and also that there is an important difference with different bases,—whether barium, sodium, or ammonium be used. As that question will be likely to receive a large share of attention from the committee above referred to, I need not enlarge on it now.

Mr. Simpson takes quite a different position in reference to the hydrometer silver meter to that taken up by his coadjutor, Mr. Hughes. I think *five* times in his notice he speaks of it giving "*approximate* results," and counsels the frequent corrections of its indications by an appeal to some of the analytical plans. That is far within Mr. Hughes's position, and in fact "approximates" closely to mine. I give Mr. Hughes's own words:*—"Speaking generally, then, this instrument [the hydrometer] is less perfect than the others, *because it is applicable to only one of the two photographic silver solutions;* but for that one it answers ADMIRABLY, and may be depended on more certainly than the others (*i.e.* the analytical testers of Horne and Thornthwaite, Wood, and Hockin). Mr. Hughes is right. According to the record of results he gave us these testers on the analytical method were *not* to "be depended on," even when tried on a new bath of known strength. Mr. Simpson says Mr. Hughes's advice is†—"That the analytical test be used occasionally, once in a week or two, for verification, or for ascertaining how far the solution is in a state

* THE BRITISH JOURNAL OF PHOTOGRAPHY, Vol. VIII. page 44.
† *Photographic News*, Vol. V. page 87.

to allow the hydrometer test to be regarded as indicating approximately the strength of the printing solution." Where does Mr. Hughes give such advice? Not in the quotation I give above. If he had, it would be a comfortable recommendation, certainly! try your bath by a *certain* test to see if you may gratify yourself by applying an *uncertain* one!

A few words now on Mr. Hughes's "Remarks" on my paper. I will quote and refer alone to the edition of Mr. Hughes's "remarks" which appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY (the editor of the *Photographic News* says Mr. Hughes considered his paper as "emasculated" by the trifling alterations made by the editor of THE BRITISH JOURNAL OF PHOTOGRAPHY). Mr. Hughes remarks that the whole purpose of my paper was to *pervert* and *distort* his views. Where have I done so? No instance is given. The whole purpose of my paper was to give my views on the whole question according to my convictions of what was the truth of the matter. And that is a sufficient answer to his question—Why did I try collodion baths at all, "seeing," he adds, "*I* had more than once distinctly stated it was not suited for them?"—I was investigating the matter fully, though we only took a few days to do so, and I was requested to try the collodion bath. The hydrometer was being used *here* for collodion baths, and hydrometers were made and sold here which were alone useful for baths of thirty grains and under. And my trial and "parade of figures," as Mr. Hughes calls it, proved that with these baths the error in estimating the amount of silver by the hydrometer tester may be on *either* side, and not, as he firmly stated, always on one side.

Again: Mr. Hughes asks if we, in the "plenitude" of our "confidence," tried the standard solution of chloride of sodium on a solution of known strength—or rather he says we did not do so. We *did*, and offered to show the Society the same repeated. I do no more now than refer the reader to my paper.

Mr. Hughes surmises that the paper on testing of used baths was my first paper addressed to any photographic society, and that I was, therefore, unaware of the amenities usually expected. Is this an excuse for his going into a towering passion, and calling "this person" all sorts of names? Little boys never like being flogged; and I am not sure of its efficacy in making offenders much better,—Solomon's dictum, notwithstanding. But Mr. Hughes is wrong: it was *not* my first paper addressed to any photographic society—nor my second—nor will it, I hope, be my last either. I might have read many papers. Mr. Hughes has often told me that I should have done so, and has requested and obtained formulæ from me for his own personal use, if I would not publish my plan in the journals.

But he says we "must needs make a blunder in the equivalent weight of chloride of sodium, taking 60 instead of 58·5."—We have respectable company to blunder in, if that be a "blunder." Mr. Hardwich, in his *Manual of Photographic Chemistry*, sets it down at 60; so do the Almanacks of the *Photographic News* and THE BRITISH JOURNAL OF PHOTOGRAPHY. And Mr. Hughes, in his paper on the hydrometer tester, refers to Mr. Hardwich's* having given a plan of testing baths by precipitating with chloride of sodium, and extols it as being accurate to half-a-grain. Now, in this same plan, the equivalent of chloride of sodium is taken at 60—or rather, coming to decimals, 60·2—if the equivalent of nitrate of silver be taken at 170. I could quote a large number of authorities for 60 as the equivalent of chloride of sodium; but I prefer to prove Mr. Hughes wrong as it were by his own words. As he quotes Hardwich, even supposing Hardwich to be no authority, yet having homologated Mr. Hardwich's assumed error, Mr. Hughes debars himself from the agreeable privilege of finding fault with me for quoting from the same source of information.

I may remark further, that I knew quite well that most recent works on chemistry discard the *even* number 60, and adopt a lower one more consistent, with the precise results of the most careful analyses. But 58·5 is not a generally received number: one finds all numbers from 58·2 up to the old even number 60. That forms no difficulty, if we want to be very accurate; and this plan of testing a solution of nitrate of silver is capable of the *greatest* accuracy,—more so than even that of precipitating the silver with hydrochloric acid, and drying and weighing the chloride of silver.* Mr. Hughes will see, in the article quoted below, that Mr. Henry proposes bringing the solution of chloride of sodium to such a degree of strength, by experiment, that the assayer may be able to determine to the $\frac{1}{1000}$ part of the amount operated on. The assayer wants to know how much pure metal is in an alloy: he tries the standard solution for 1,000 assays, by dissolving what he knows is pure silver, and testing it. The photographer wants to know how much nitrate of silver is in an old bath of the *same quality* as the nitrate he originally made the bath from. He has only to try his standard solution of chloride of sodium on this same nitrate of silver, in a fresh solution, and bring the sodium solution to the strength that will indicate the true amount of nitrate of silver he knows he is operating upon. Once right, it will serve till used up, and will be easily made up again with the same materials as before. The assayer does not trouble his head about the *purity* of chloride of sodium, nor combining equivalents either, but makes up his solution near the truth, and brings it by *experiment* to perfection—to the perfection we have indicated above.

* Hardwich's *Manual of Photographic Chemistry*, fifth edition, page 491.
† See Ure's *Dictionary of Arts and Manufactures* (edited by R. Hunt), 1860, article "Assay," by T. H. Henry, F.R.S., C.S., vol. I, p. 219.

That is the only fact in my paper upon which Mr. Hughes puts his finger. How much has he gained by it? My whole facts are unimpugned—my deductions uncontroverted. I do not say my positions are unassailable; but as yet they remain intact.

I conclude with a request that the reader who feels interested in the subject will turn to my article; and if, on reading it over, he feels I advance any opinion not supported by evidence produced or referred to, let him discard it: or, if he find I have not treated my opponents with proper courtesy, *he will please to erase the offending paragraph or sentence*, AS I WOULD WISH TO DO. It is my earnest desire, in this as in all else, to do as I would be done by. The Scotchman's national motto is *Nemo impune lacessit*. Perhaps we are too apt sometimes to turn the thorns of our thistle towards our opponents. Mr. Hughes's long residence in Glasgow ought to have familiarised him with our peculiarities.

A word in conclusion. Mr. Simpson seems to think it an approach to photographic treason to call in question the conclusions announced by Mr. Hughes; and Mr. Hughes himself almost endorses the opinion, I think. My acquaintance with Mr. Hughes is not of yesterday. I had for years been accustomed to think of him as a photographic friend. When or how has my old friend got to this supereminent position that no one can safely doubt his oracular enunciations? I am neither proud nor ashamed of being now resident in Glasgow. Mr. Hughes had reason to be pleased with having been for a considerable number of years a *successful* Daguerrian in Glasgow. How long, then, will it be since he ceased to be a "provincial" photographer? I really cannot see the force of this. Very creditable men in every walk of intellectual and moral labour have come from the provinces, in all countries and in all ages. To talk lightly of the country and country people is simply a Cockneyism. It seems doubly inappropriate in the columns of a provincial photographic journal, which is so successfully vindicating by its usefulness and very wide acceptance the possibility of a provincial production equalling—I had almost said far excelling—any metropolitan competitor.

I now close the discussion so far as I am individually concerned, and will not be tempted again to reply to any future attack.

Exhibitions.

LONDON PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[FINAL NOTICE.]

OF the whole class of *reproductions* of which the present collection affords numerous examples, we have but little to say, beyond the statement that they are generally well executed. Highly valuable as this application of photography undoubtedly is it is chiefly, if not entirely, mere mechanical skill that is required to ensure success. In evidence of the accuracy of this assertion we have but to point to the fact that, wherever a photographic copy of an engraving or drawing in monochrome is made, the reproduction is so perfect that, in some cases, it is difficult to distinguish between the original and the copy; but when paintings or water-colour drawings are operated upon, although the forms are accurately repeated, the effect is frequently unsatisfactory, owing to the difficulty of properly translating the influence of colour into hues of black, white, and grey—in the former case, a collodion giving hard, dense pictures alone being required; in the latter, one capable of giving half-tone is imperative. But more than this, to copy a painting well, so as to convey a pretty close impression of its language, requires for its successful practice considerable chemical and scientific skill, many of the difficulties being conquerable by the judicious use of certain chemicals, combined with management of the light by which the pictures are illuminated. Now, if we refer to the copies of paintings in the present collection, we find that most of them are sadly deficient in the quality of conveying the poetry of the originals—some to a much greater extent than others, even by the same operator. We are therefore convinced that there is far more of the work of the hand than of the brain employed in this branch of the art.

We now approach a corner rich in fine specimens. There are two *Views in Warwickshire* (Nos. 175 and 176), by Josiah Spode, that are exceedingly effective in execution and highly meritorious. Here, also, are half-a-dozen of Mr. Mudd's beautiful proofs from collodio-albumen negatives. In *Watsdale Head.* (No 169), *Watsdale* (182), and *Teesdale* (183), the method adopted by this operator for avoiding the hardness arising from painting out a weak sky is well displayed, and it must be admitted that it adds materially to the value of the proofs as pictures—which, by the way, are deserving of almost any amount of labour to obtain. We must also add a word or two of commendation for the excellence of the printing.

Of Mr. Fenton's studies of *Fruit and Flowers* we have already spoken in laudatory terms; there are many of them at this end of the room which, no doubt, attract a large share of attention. It

is true that to acquire all possible beauty they do require the application of colour. We remember to have seen some specimens of flowers, on a smaller scale, that had been well tinted, exhibited at one of the meetings of the North London Photographic Association, and are convinced from what we then saw that a profitable field is open in this direction to any artist having the requisite skill, as such productions, well got up, would meet with eager purchasers.

Mr. Robinson's *Holiday in the Wood* (No. 136), we notice, in passing, attracts much admiration. Mr. Dixon Piper's *Lock Gates, near Ipswich* (No. 121), is a striking picture and well executed, but s a little deficient in vigour.

In the corner corresponding to that previously remarked upon' we encounter another "nest" of Mr. Mudd's productions, quite equal to those before mentioned,—*Study of Rocks, Perthshire* (No. 99), *On the Greta, Rokeby Park* (No. 103), and *Goodrich Castle* (No. 104), being especial gems.

To the few maligners of the Fothergill process we would suggest a careful examination of No. 91 (a frame containing four subjects), by Mr. S. Bourne, of Nottingham, particularly defining *Loch Lubnaig* and the *West Entrance of Lichfield Cathedral*, as evincing what excellent results can be attained by it.

The Rev. T. M. Raven appears principally, if not entirely, as an operator upon waxed paper; and good as his proofs are, considering the nature of the negatives, we are constrained to admit that they prove unquestionably the superiority of glass as a basis.

Dovizielli's reproduction of Guido's *Aurora* (No. 40) elicits the the highest applause for its successful rendering of the original. The same artist's large photographs of *The Coliseum* (No. 30) and *St. Peter's, Rome* (No. 52), are not, in our opinion, by any means so satisfactory. Both are too black and white, and the shadows heavy. The few trees visible might as well have been cut out of black paper; and there is such unmistakeable evidences of a free use of the brush upon the negatives that, regarded simply as photographs, they would be out of court for competition. The *St. Peter's*, too, is disfigured by considerable distortion and by the ghosts of vehicles and foot passengers.

One extraordinary feature of this year's exhibition is the amazing number of *card-portraits* as they are called. Of course there are but few of these which possess any particular public interest, while with regard to some we cannot but conclude that the exhibitor would have enhanced his reputation by reducing the number displayed to one-half, or, in some cases, one-third of those contained in the frames. But, while commenting on this class of production, we must altogether except those of Her Majesty and the members of the Royal Family, exhibited by Mr. Mayall, which, in point of execution as well as of interest, are unrivalled by any in the room. We are afraid to state how many thousands of these portraits have already been sold by Mr. Mayall, lest we should be charged with exaggeration; but we may remark that the number is so great that alone it affords no inconsiderable evidence of the affectionate loyalty existing towards our Sovereign by her subjects.

In interiors and other architectural subjects Mr. Bedford distances all competitors. *Chantry in the Nave of Wells Cathedral* (No. 417), and *View in the Ladye Chapel, Wells Cathedral* (No. 448), are first-rate samples of interiors; and *The North Porch of Wells Cathedral* and *South-west Door of Exeter Cathedral* (No. 442), corresponding ones of exteriors. It is on the third screen that Mr. Bedford appears in strongest force; but his pictures are all so excellent it would occupy more space than we can now afford to particularise all we have specially noted. We must therefore be content with asserting that in the present collection Mr. Bedford's works form decidedly the most prominent feature, and are one and all unexceptionable.

In our former notice we remarked upon Mr. David Campbell's contributions as possessing superior excellence. *Home! Sweet Home!* (No. 427), *The Auld Brig o' Doon* (No. 433), and *Cranfordland Castle* (No. 453), are all artistic studies.

Mr. Robinson's *Top of the Hill* (No. 465) is a well-designed subject, though he has not been quite so happy in his model as could have been desired. Unless we mistake this is one of the pictures that we commented upon in the recent controversy upon printing from several negatives.

Mr. J. Reeves Traer is the only exhibitor of microscopic subjects—four only of which are included, and these are unfortunately placed very high up on the screen. Of these the *Xylocopa violacea* (No. 511), an acarus parasite of a bee, is the most interesting. Few persons are aware of the difficulty of photographing microscopic objects, requiring objectives of high power and large angular aperture for their definition. In addition to all the ordinary troubles there are superadded variation of chemical and visual foci, and severe restriction of definition to one fixed plane in the object; so that if the latter be of any appreciable thickness it cannot even be seen without focussing up and down with the fine adjustment—in which case of course to photograph it would become an impossibility.

Mr. Wilson's gems we have already noticed, and have also alluded to Mr. J. Maxwell Lyte's artistic pictures; but these last in particular, force upon our attention the great necessity existing for endeavouring to overcome the chemical difficulty of the impaired sensitiveness of the sensitive film to the green rays. Mr. Lyte's pictures all suffer more or less from the darkness of the foliage as appearing in the photograph.

With this we must bring our remarks to a close, so far as the exhibition for the present year is concerned.

EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

FROM ANOTHER POINT OF VIEW.

It is, we think, pretty generally admitted by all who have visited this Exhibition that, although inferior to the one of last year in point of the number of pictures exhibited, it is superior to it in artistic excellence. The room is large, comfortable, and well lighted both by night and by day; and from a more judicious arrangement of the pictures—consequent, however, on their reduction in numbers this year—less inconvenience is experienced than formerly.

There is but little in this Exhibition that will present much interest to the merely scientific photographer; for, with the exception of two or three of Joubert's specimens in enamel, there is nothing displaying any scientific novelty. We have looked in vain in the hope of finding some specimens of photographic or heliographic engraving. Equally unsuccessful have we been in our search for photo-lithographs. Herr Pretsch's new and valuable discovery of blocks for surface-printing seems to be ignored. Not a solitary specimen of carbon or other "pigmentary" prints is there to be seen; nay, even the poor old daguerreotype process has not had one exponent, and the once-favoured albumen process musters only some one or two bantlings. The collodio-albumen process finds a representative in only one man; but, that man is a host in himself, and has done more to elevate this process than any other man.

The majority of the pictures are by wet collodion, a few by dry, and the remainder (about fifty) by waxed paper.

The Society under whose auspices this (their fifth) Exhibition is held is, numerically at any rate, very poorly represented; for, out of a list of 160 members, only thirty are exhibitors—the *total* number of exhibitors being eighty. Among the fifty who are not members rank the well-known names of Mudd, Maxwell Lyte, Dixon Piper, Fenton, Mayall, Bedford, Vernon Heath, Annan, Hering, Frith, and others. It has created some surprise that out of the great number of professional photographers in Edinburgh, Tunny, Moffat, Macleay, and Armstrong have alone entered the arena.

With these few prefatory remarks, we will now take a look at the pictures themselves, commencing with those to which Mr. Horatio Ross has awarded the prize medals, and the other works of the same artists. No. 106 in the catalogue is a beautifully-rendered view of the *Valley of Pierrefittes, in the Pyrenees*, a subject admirably adapted for an effective photograph. It will be in the recollection of most of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY that the prize picture by Mr. Raven, two years ago, was a representation of the same subject; but from what cause soever it may arise, whether from advances in the art generally, or from the superior capabilities of collodion over waxed paper for rendering such sharpness and admirable gradation as characterises this picture of Mr. Lyte's, certain it is that the superiority of the one over the other is marked. A village in the foreground, a plain in the middle distance, with magnificent mountain masses in the extreme distance, hemming all in, form the chief features of this picture. The effect, we think, is a little marred by the overprinting of the left side of the picture; and the same failing characterises several otherwise beautiful works by this artist—for instance, 281, in which the sloping braes on the left are rendered of pitchy blackness, 292 and 296 partaking of similar faults. Now this, we doubt not, arises from the great difficulty of rendering, with the requisite efficiency, distant, and, it may be, snowy mountains, and at the same time doing justice to the objects in the foreground; but it would be well worth while adopting some plan of screening the "distances" a little, while the foreground was getting more thoroughly impressed. Mr. Maxwell Lyte, lucky man! has an

advantage which few in this country possesses—he has easy access to some of the most magnificent scenery under heaven.

Turn we now to No. 67, the other prize picture—*A Portrait of a Lady*, in a white dress, by M. Claudet. The size of this picture is thirteen inches by ten. The subject is a full-length portrait of a lady arrayed in something akin to a bridal dress. With all deference to Mr. Ross's judgment, we are inclined to the opinion that this is not by any means the best of Claudet's pictures; for although the size is great, and the posing graceful, there is considerable want of detail in the upper part of the dress, and the hands and face, by contrast, look dark. We quite admit the difficulty of taking such a subject perfectly; but a man of M. Claudet's vast resources should be able to overcome all difficulties, and render in perfection whatever he undertakes. It is, however, a very excellent picture, but not in our opinion equal to another lady, by the same artist, this one (533) being in a black velvet jacket. We much question if among all Claudet's pictures there is one which can excel 543, a portrait of Mr. Horatio Ross, who in this portrait is depicted in the dress of a captain of volunteers. Claudet exhibits altogether about two dozen pictures.

So much has been written about *A Holiday in the Woods* (65), a composition picture, by Robinson, (size, twenty-two inches by sixteen), that we deem it unnecessary to make further allusion to it here, than to say that, on the recommendation of Mr. Ross, the Council of the Society has awarded it a bronze medal. In our opinion it has a cut-out sort of appearance, which we do not like. Possibly our taste may become so improved (?) as to like this sort of thing by-and-by. There is another picture of this sort by the same artist—*The Top of the Hill*—which we think preferable to his great work.

Among the productions of Scotch artists, those by T. Annan, of Glasgow, must occupy a prominent part. He exhibits about fifteen pictures, most of which are large, well defined, and of beautiful tone. Without entering into the merits of his pictures individually, we may be allowed to point out 280, *Inversnaid Waterfall*, as a picture of great beauty and force.

Mr. Horatio Ross shows five pictures, the subjects being *Dead Game*.—No member of the Society has the same facilities for producing this class of pictures, and his arrangement of the dead deer, &c., is marked by the artistic excellence which usually characterises this gentleman's works. Were he to employ a lens having greater *depth* of focus, or make use of a smaller stop in his present one, his pictures would be still better.

Mr. Finlay Anderson sends four views from waxed-paper negatives. Although his points of view (especially 139, *Village of West Kilbride)* are very carefully selected, yet the granularity and general hardness of these pictures induce us to advise him to lose no time in adopting some important modification either in the process itself or in his manner of manipulation. A few months ago Mr. Anderson brought before the Society the importance of keeping the "sky line" much lower than was usually done. In his *Farmhouse, Elie*—and *Bungalow, Madras* (Nos. 140 and 141), this doctrine is illustrated rather too freely. We have, however, no objection at all to an excess of sky, provided there are a few clouds to disturb the unbroken monotony of pure white paper. We would advise Mr. Anderson to try collodion in lieu of the waxed paper.

A. Y. Herries exhibits fifteen pictures, all by waxed paper. His pictures are uniformly good, some of them being particularly so. Chief among this latter we might point out 243, *St. Brelade's Church and Bay, Jersey*. We may state that a great number of the scenes depicted by this artist are in Jersey and Guernsey, and form as good specimens of the capabilities of waxed paper as any we have seen in this exhibition.

Mr. Rimmer sends two portions of views of *Roslin Chapel* (Nos. 275 and 401). They are clear and well defined, but are taken with a lens which has been quite inadequate to the task imposed on it, as his parallels show signs of *circular convergence*, which, in an architectural subject like the present, is very faulty.

It is with decided feelings of disappointment that we turn this year to Mr. Raven's pictures. He sends twenty-five, most of which, were they not recorded as such in the catalogue, we never could have dreamt of as being his productions. *Waldringfield Church* (No. 267), although in good focus, is a singularly inartistic picture. We particularly mention this picture, because some critic has, in a local paper, awarded it the chief place among the works of Mr. Raven in this exhibition.

Mr. W. Scott Elliot exhibits fifteen pictures—some by collodion and some by waxed paper. Among this gentleman's contributions like many others, there are some pretty good pictures, and others not so good. Of his case of four pictures (No. 336 *et seq.*), *The Old Bridge of Earn* (338) is the best, and, when viewed from the proper distance, is perhaps the best one in his contribution. No. 335, *The Village of Kintillo*, is a very unfavourable specimen of this artist's productions, owing to its patchy hardness.

Mr. Rodger, of St. Andrew's, sends nine pictures, and we shall dismiss them with a few words. While, on the whole, he does not this year come up to himself, he still has one or two which are perfect gems. There is a brilliancy and exquisite sharpness in the details of his portraits that we look for in vain even in the prize portrait. One of this artist's productions, *Master Coates* (No. 539), we have no hesitation in saying, is the most pleasing portrait in the exhibition. It is a portrait of a little boy, five or six years of age, on an easy chair; and the rendering of this subject is faultless. We are glad, for the credit of old Scotland, that it has been placed in juxtaposition with *another boy*, by Claudet. Claudet's *boy* is good, but Rodger's is exquisite. AUR. CHL.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Tuesday evening, the 5th instant, at eight o'clock, at King's College,—Francis Bedford, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed and declared duly elected members of the Society:—Mr. Thomas Sutton, B.A., Professor of Photography, King's College, the Hon. E. Wingfield, R. K. Dick, Esq., Capt. James Buchanan, of Madras, T. Morris, Esq., Lewis Musgrave, Esq., and Albert W. Hall, Esq.

Mr. Spiller explained his new desiccating box for sensitised dry paper. It consisted of a case (of any convenient dimensions) of some depth, made of well-seasoned deal. Into the bottom of the case a tray, about four inches deep, fitted, which was half-filled with lumps of fresh lime; over this fitted a perforated shelf, on which the papers were thrown *in rolls*, just as they came from the drying cupboard. The sensitive papers could be kept good in this apparatus for a fortnight or three weeks, or even longer. When the lime became entirely slacked, it was replaced by a fresh charge. When the paper was required, it was necessary to expose it to the atmosphere, in a dark drawer, for a few hours, so that it might reimbibe some of the moisture that the desiccating body had removed, otherwise the paper did not yield such satisfactory results, from being *too* dry. Mr. Spiller stated that he had found paper weighing eighty grains when taken from the box acquired seven grains additional after exposure to the moisture of the atmosphere, being about eight per cent. increase in weight; and it was the removal of that eight per cent. of moisture that constituted the advantage derived from the employment of the box. He thought that dry collodion plates might be preserved in the same manner, and also that the method would be found useful in preserving varnished negatives during cold weather, by preventing them from cracking. He had several plates (which he produced) entirely spoiled by the film cracking, in consequence of their being placed in a damp room during the cold weather.

In answer to Mr. Shadbolt,

Mr. Spiller said he had never employed his box for the preservation of albumen or any dry plates. The action of the lime would not coagulate the albumen, but it would abstract a great deal of its moisture.

Mr. Vernon Heath inquired whether Mr. Spiller had ever tried Marion's cases, as he had kept paper in one of them for three months; but, as in Mr. Spiller's method the paper became too dry, and required exposure to a moist atmosphere before using, what was the special advantage of Mr. Spiller's box over that of Messrs. Marion and Co.'s?

Mr. Spiller said its cheapness, and the convenience of being able to throw in the rolls of paper without the trouble of spreading them out in sheets. He thought lime was better than chloride of calcium.

Mr. Shadbolt suggested the use of a lead drawer, containing sulphuric acid in place of the lime, to adapt it as a drying box for albumenised plates.

Mr. Hughes observed that photographers did not seem to approve of dried paper in general. Their objection might arise from their omitting to restore the necessary degree of dampness to the paper before using it. He had himself noticed a resistance to tone in paper so dried although it answered very well in other respects.

Mr. Fry produced a photographic print that had accidently been kept sensitised for some time before it was employed. He said that the plan that he adopted for preserving sensitised paper was very simple; viz., putting the sheets into a tall glass jar with a layer of salt at the bottom covered with a piece of cardboard. The paper kept very well when so preserved, but still he found that it acquired a horny surface through which the toning liquid seemed scarcely able to penetrate; however, for a few days it kept very well indeed.

Mr. Eliot said that Mr. Sedgefield had tried to keep a large quantity of sensitised paper in a box containing a tray of chloride of calcium, but

he always found that with the exception of five or six sheets at the bottom and top they were all spoilt.

The CHAIRMAN suggested that too much atmosphere might be shut into the box.

Mr. FRY agreed with the chairman on this point. He also thought that deal cases might prove prejudicial—that glass or metal was far better for the purpose.

Mr. MALONE said it was necessary to watch carefully to see that through the absorption of water the action was not exhausted. The objection to lime was its rapid power of absorption, by which the paper was too much dried; but that objection applied in a greater degree to chloride of calcium, and still more so to sulphuric acid. He had personally no liking for the desiccating plan. He thought that if, when photographers prepared their paper, they would dry it in a steam bath, put it whilst hot into a tin box, or screw it down in a pressure frame, it would be found to be preserved sufficiently for their purpose, and they would then not be annoyed by a horny surface, as Mr. Eliot stated. Of course where the papers were put in a thick pile into a box the chloride of calcium could not act upon the middle papers until after several days. The chief advantage of Mr. Spiller's plan was that the papers were thrown into it in a roll, and the surface of each was properly exposed to the desiccating action.

A discussion than took place as to the cause of the cracks in some negatives exhibited by Mr. Spiller. The Chairman, Dr. Diamond, and Mr. Thomas did not attribute them to the varnish, but to the original improper drying of the film, or to the fixing agent not being properly washed out. Mr. Spiller and Mr. Fry considered the effect to be owing to the frost and damp.

Dr. DIAMOND said he kept his negatives in a damp place, in a temperature frequently below freezing point, yet they had not cracked; but he produced two prints that had hung on a damp wall that had completely faded, whilst other prints in the same room, but on a dry wall, were unaffected.

Mr. MALONE said some of Mr. Talbot's pictures, which had kept very well in a frame exposed to the sunlight, had faded entirely when put into a damp place. The fact was, it was impossible to keep photographs when exposed to the action of damp or sulphurous vapours, let them be toned and varnished in whatever manner they might. It was much better to tell persons buying photographs so at once than to lay the blame on the materials employed. If people chose to expose their photographs to damp it was impossible to control the action of the elements, and fade they would. Mr. Spiller's drying box might, therefore, be usefully employed in preserving the prints, as well as the plain sensitised paper. With regard to the cracks in the negatives, mentioned by Mr. Spiller and Mr. Fry, why should it not be due to the unequal expansion of the collodion film and the varnish? With regard to the washing of the film he did not admit that *all* the hypo. *was* removed in general; for different collodions required a different amount of washing, and it was very difficult to know when the film was sufficiently washed. They ought to determine upon some test for determining the point when the washing was sufficient, for at present they were quite in the dark.

Mr. BOHN, in referring to Dr. Diamond's faded pictures, observed that they had been lying upon a damp lime wall, which dissolved the size in the first instance, and then destroyed the print. The same effect would have occurred if they had been engravings instead of photographs.

The discussion on Mr. Hughes's paper read at the last meeting was then resumed.

Dr. DIAMOND read a letter on the subject of the manufacture of paper from Mr. Hardwich.

Mr. G. F. BUSBRIDGE (a paper manufacturer, of the firm of Spalding and Co., Maidstone Mills) had read with the double interest of a photographer and a paper-maker the account of their last meeting, and he looked with great jealousy upon the remarks of those gentlemen who said the English manufacturers could not compete with the foreign manufacturers in making paper adapted for photographic purposes. Being conversant with the subject, he felt those remarks to be unjust to the English manufacturer, whom he was sure had only to be informed of the requirements of photographers to produce a paper superior to the foreign. In making the paper for photographic purposes only one sort of fibre ought to be used, by which means a uniform and perfect paper might be produced. If the brilliancy of colour so much admired were desired they could produce it just as well as their continental friends. Gelatine and resin had been recommended for sizing, but he thought they could produce a better size than either. He took great interest in the matter, and he wished to succeed, not so much for the sake of £ *s. d.*, as for the sake of winning what might be called the blue riband of the Society, and to show the world that the English paper-maker would not be left behind. Let the Society but co-operate with the paper-makers, and give them suggestions, and they might rely on soon having the exact description of paper they desired.

A vote of thanks was passed to Mr. Busbridge for his offer of co-operation.

Mr. SHADBOLT drew his attention to the minute metallic spots in the paper of which photographers had reason to complain so bitterly.

Mr. MALONE said that they arose from pins and buttons being left in the rags from which the paper was made, and these were chopped up in the mill, and so became incorporated in the pulp.

Mr. SEBASTIAN DAVIS said that after the very handsome offer made by Mr. Busbridge it appeared to him that specimens of plain unsized paper should be put into the hands of those members who expressed an inclination to experiment on the subject, as well as specimens sized with gelatine and starch, so as to enable them to furnish data for the manufacturers' operations. He thought, however, that the Society should not confine its communications to one manufacturer alone, as that might produce a monopoly.

Mr. FRY said perhaps it might be possible to produce a paper with such a surface that it should not require albumenising.

Mr. THOMAS said that, as alum was employed for fixing the mordants, might not that throw some light on the sulphurous decomposition and decay so frequently occurring? and might not alum be a very injurious ingredient to introduce into paper required for photographic purposes? By its use they had at once sulphuric acid in contact with the chloride of silver. He thought some other mordant might be used in preference.

Mr. BUSBRIDGE said that alum was used for fixing delicate colours in the papers; but, as the paper they required would be colourless, the smallest quantity of alum would suffice as a preservative for the gelatine size.

Mr. MALONE advised paper manufacturers not to trust too much to the opinions of photographers, who were all utterly in the dark with respect to the most elementary points of this subject. He was sure alum was not a cause of fading; for he had in his possession some unfaded pictures that were printed in 1844, on paper made at Hollingworth's mills, and treated with alum. They were washed with hot water, and if the size could be dissolved with hot water the paper would be reduced to the condition of blotting-paper. He did not exactly know the action of the alum, but it was supposed that the alumina separated from the sulphuric acid and mordanted the gelatine to the fibres of the paper. What became of the sulphuric acid he could not say. He did not know whether alum was better for performing that operation than resinous soap. He thought they wanted brilliancy, not only on the surface but also through the body of the paper, so that it could be used for positive or negative processes. The French papers possessed this quality, and that was one reason why they were preferred. In fact the French paper fulfilled the required conditions, and the only complaint against them was that they were not uniform in character.

Dr. DIAMOND understood that hyposulphite of soda was occasionally used in the preparation of superior paper. That was just the paper likely to come into the hands of the photographer.

Mr. MALONE could give some information on that point; for when he was at some mills at Maidstone he asked if the proprietor felt disposed to state what materials were used in the manufacture of the paper, and he was told that nothing was used but alum and size made from fresh hoofs kept in running water, and then boiled in clear spring water until they dissolved. Before he left the mill he took occasion to observe that a substance was used by some paper manufacturers, called *antichlore*, made of hyposulphite of soda, to cleanse the paper from the chloride required in bleaching. Upon that they admitted that they did use something of the kind for that purpose.

Mr. BUSBRIDGE said the antichlore was sometimes employed for the purpose indicated by Mr. Malone, but it was not by any means essential that it should be used in paper-making. For photographic purposes he should employ the purest materials of one kind of fibre, and avoid all chemical bodies that were unessential in the process. With one fibre, either hard or soft, thin or thick paper could be produced with all the peculiarity of surface and body they might desire, without the introduction of anything deleterious to their pictures.

Mr. VERNON HEATH was exceedingly pleased that an English manufacturer had given them a promise to endeavour to make them a first-rate paper, and he was sure they ought to give him every assistance in their power. If they could get men of energy, skill, and determination to enter into the subject, they would soon have good English paper. With regard to the paper read by Mr. Hughes at the last meeting, it was one of the most interesting of the season. That gentleman had struck a chord that it would be well for the Society to sound at all times and at all seasons. He referred to the admitted negligence and carelessness of photographers with respect to printing. It was impossible for greater injustice to be done to negatives: few people were aware of the qualities of their own negatives. They intrusted their printing to other persons, and consequently had no idea what they could, by proper management, be made to yield. He himself had on many occasions been obliged to take several prints before he could satisfy himself that he had obtained all that was possible. If they could only once induce a desire in persons to get the best results from their negatives, they would hear no more of their giving them up to the tender mercies of those who print by the acre, and almost at the same price that other work by the acre was done. He could assure photographers that there was no cheapness in that method of proceeding. There was another point to which he wished to call attention, viz., whether we had not too hastily condemned the old printing processes, and attributed to them defects which were due only to the carelessness of the manipulator. He produced some specimens, taken in 1844, by the Talbotype process, all of which, with the exception of one, were unfaded. In that one instance the fading had occurred at the edges, but in the other parts the picture still remained perfect. The fading at the edges had been attributed to the effect of the paste with which it was mounted; but he found that it was caused by the action of the atmosphere, which commenced in the first instance at the edges. He had also found

that a great number of prints toned by the method which was in use a few years ago exhibited the utmost brilliancy of tone and colour, and remained unfaded; but still he must say his feelings went almost entirely with the alkaline gold process. Nevertheless, he was quite sure they would find just as many fade by the alkaline process as by the others, not from any disease in the process itself, but from the negligence and carelessness of photographers. He used chloride of barium in his papers, and he mentioned this fact because it was stated that it would not work. There was less loss in fixing and toning when it was used, and the operator had more command over the tones. He used *Saxe* paper, and always washed his prints with the utmost care. The latter could not be too much impressed upon photographers.

Mr. Malone stated that some of Mr. Talbot's pictures, prepared in 1844, were not washed half an hour altogether, and yet they remained unchanged at the present day. During the washing they passed through six gallons of water, contained in three separate pans. What, then, became of the theory of twelve or twenty-four hours' washing being *necessary?* It was strange that they should have to finish a discussion by having to acknowledge that they really knew nothing about the matter; but, honestly, that was the state of the case. It was really difficult to find a remedy for a disease, when neither it or the constitution of the patient was understood.

The Chairman wished to say a word with regard to the culpable negligence of those persons who kept photographs—placing them on damp walls, or within reach of horrible smells—for he had known them kept in the most singular places. Would they place drawings or paintings in such positions? Then how could they expect photographs to stand such extraordinary tests, or to be permanent under such severe trials? And yet they were complaining that their pictures faded under these circumstances, and found fault with paper, process, and printer.

Mr. Sebastian Davis inquired whether Mr. Malone's pictures were printed by sunlight or in the shade, as it was said some time ago that there was a different action of chloride of silver when exposed to the actinic rays of sunlight to that which took place in the diffused light.

Mr. Malone said they were printed indifferently in sunlight or shade, according to the nature of the day on which they were operating.

Mr. Fry said undoubtedly they found some prints fade even when toned by the alkaline process with care, by persons of skill. He wanted to know why they could not use a neutral process instead of an alkaline one. There were three salts of soda applicable, viz.:—Phosphate of soda, acetate of soda, and carbonate of soda; and he found that a paper that would not tone with one bath would answer very well with another; he, however, rather preferred the acetate of soda toning-bath. He considered Mr. Hughes was hasty in the opinion he had passed on the *hypo.* bath, for photographers had not done it justice when using the filthy black liquid they were in the habit of toning with, and photographs toned in such a bath could not be expected to last. Another point was, that there were many negatives taken that yielded a very weak result by the alkaline process, and those, he believed beyond a doubt, would yield much better results if toned with the old hypo. bath. In fact, professional photographers had not, as a body, quite relinquished the old bath, as there were some negatives that could not be treated successfully by any other process.

Mr. Eliot had tried four grains of citrate of soda to every grain of gold, with which he had produced most brilliant pictures. Since that time he had tried to use that solution with *papier Rive;* but he found that he could not get the pictures dark enough, and he then tried the alkaline process with it, which answered well enough. Some years ago he found the alkaline process did better on English than upon foreign paper, without leaving that cold blue colour over the picture. He mentioned these facts to show that they must not take up one solution and suppose that it will do for all papers under all circumstances. They must vary their method according to the nature of the paper they had to deal with.

Mr. Hughes, in bringing the discussion to a conclusion, said that, as he had previously stated, a good print was the sole end and object of their labours. Photography had passed from the condition of a mere scientific amusement and had become an every-day *want;* and, at the present time, it was one of the great questions of the age. Their very difficulties were national, if not human; and he thought they could get up a case for a Royal Commission to investigate with much more plausibility than very many objects that had received that distinction. He must say that he had expected there would have been more practical *experience* laid before them on the subject than there had been; but the discussion had touched a more vital point—that which was at the bottom of all their difficulties—viz., the paper. Ever since the days of Fox Talbot paper had been the sore point. He thought it was a pure accident that the French or German paper should have answered their purposes better than the English; for he had no reason to believe that the foreign manufacturers had tried to meet the views of photographers any more than the English makers had done. It was most desirable that the question of the primitive nature of the paper should be seriously entered upon by those competent to deal with the subject. Photographers had always desired to have more control over the manufacture of the paper; but for the first time in their lives they had heard that they were to have the assistance of a gentleman competent to deal with the subject, and he need scarcely say how much the information pleased him. He had albumenised all kinds of paper from different parts of France, Germany, and England; but the results had convinced him that more depended on the nature of the plain paper than anything else. Unless they could obtain the proper kind of paper they would find their troubles increased by the alkaline gold toning process, simply because with it the best results could not be obtained on the inferior qualities of paper, whilst anything would do with the old process. Photographers had hitherto great wants which they could only satisfy by means of foreign manufacturers; but now that it was shown, as a commercial fact, that they used large quantities of paper, paper manufacturers were willing to come forward to take the matter in hand. It was an entirely new phase in their history, for they never yet had a supply of good paper expressly made for their use. Most people when they talked of Saxe-paper knew nothing more about it than that they supposed it came from Germany; and when they talked about *Papier Rive,* they did not know whether it was the name of a maker or the name of a place—in fact, they knew nothing about the nature of the paper they were dealing with. His last address was only intended for the purpose of opening the question, and of drawing out other people's opinions and knowledge on the subject. With regard to Mr. Fry's observations respecting the advisability of using the organic salts of soda under different circumstances he entirely concurred, as he was sure one *formula* would never suit all papers; and he would recommend printers to try the effect of the tartrates, oxalates, formiates, and the endless series of analogous organic compounds, as well as the citrates and acetates, in connection with chloride of gold, and he had no doubt but that an improved method of gold toning would arise from such experiments. With regard to the prints produced by Mr. Malone and Mr. Vernon Heath, toned with sulphur, all he could say was that, when one was troubled with the difficulties of gold toning, the tempter Sulphur points to one or two prints, and says—"These were printed in 1844, with sulphur, and are still unchanged, therefore, &c., &c." But it would be found that, whilst ninety-nine out of every hundred toned by that process went the way of all flesh—and photographs—a far larger proportion of gold-toned photographs remained unfaded, if carefully manipulated. Their weak point was still the hypo. bath. Whilst they now flattered themselves that they had found a way to depose his Sulphur Majesty, with characteristic vindictiveness he still managed to do them harm, if they were off their guard; for the fact was, they used the same hypo. bath too often and changed it too seldom. They often found the stale hypo. bath improved the tones, and thus, *unconsciously* going back to sulphur toning, they reinstated his Infernal Majesty on his throne without knowing it. The great point was to discover some more suitable fixing agent—something that would not give rise to sulphurous decomposition. Dilute liquor ammonia had been proposed; but it was but the other day that hyposulphite of soda was discovered—for its discoverer, Sir John Herschel, still lived; and it was scarcely to be supposed that, if this substance had not been found, something else would not have been used in its place for fixing purposes. He hoped to see the day when some harmless agent would be discovered for dissolving out the chloride of silver from their prints.

The thanks of the meeting were accorded to Messrs. Spiller and Hughes for their communications.

The proceedings terminated with the usual vote of thanks to the Chairman.

Specimens of landscapes with clouds introduced, also of an enlarged portrait, were exhibited by Mr. Samuel Fry. Photographs were also exhibited by Dr. Diamond and Mr. Heath, in illustration of points in the discussion.

In apparatus, the drying-box described by Mr. Spiller was also exhibited by him; and a folding camera, as well as one of a novel construction adapted for lenses of both long and short focus, without the latter being drawn within the sides, were exhibited by Messrs. Murray and Heath. These last, we were informed, comprised a portion of the outfit for a mission to Africa; but we did not learn the name of the gentleman who is to use them.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Wednesday evening, the 27th ult., at eight o'clock, at Myddleton Hall, Upper Street, Islington.—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed and declared duly elected members of the Association:—Mr. W. Rodgers, of Montrose; Mr. T. Stone, Mr. Edward Scott, and Mr. James Shepherd, jun., of Aldie, Aberdeenshire.

Mr. Barber read a paper *On a New Method of Preparing Pure Nitrate of Silver from Metallic Silver Alloyed with Copper.* [See page 83.] During the reading of his paper he produced specimens of the granulated silver, of the nitrate of silver contaminated with copper, and of the nitrate of silver crystals freed from the copper, referred to in his communication.

The thanks of the meeting were awarded to Mr. Barber for his paper.

The Chairman observed that Mr. Burnett made use of copper in his photographic printing, to obtain certain tones. He used it first with nitrate of uranium.

Mr. Barber said a mixture in the bath of half a drachm of nitrate of silver with half a drachm of nitrate of copper would produce a very faint negative.

Mr. Barber then read a paper on a *Delicate Test for Organic Matter in*

Distilled Water [see page 100], and produced several bottles of solution illustrative of the subject.

Another vote of thanks was passed to Mr. Barber.

The CHAIRMAN considered Mr. Barber's second paper to be of considerable importance to photographers, as pointing out a ready method of detecting the smallest amount of organic matter.

Mr. HILL had found a yellow precipitate in some distilled water, and although he had noticed no ill effects in its use in printing, it might have given rise, ultimately, to imperfections. Had Mr. Barber filtered the solutions? as that might account for the presence of the organic matter.

Mr. BARBER said none of the specimens he produced had been filtered. Directly the solution was put in the sun it became discoloured.

The CHAIRMAN, in connexion with the subject before them at the last meeting, had brought for their inspection two of the hydrometers manufactured by Messrs. Negretti and Zambra—one for ascertaining the specific gravity of liquids heavier than water, and the other for those lighter than water. By their means an ounce of liquid could be tested with considerable accuracy. They did not give the number of grains to the ounce, but only the specific gravity, and the former had to be calculated from the latter.

Mr. SHAVE said in that case it would be desirable that they should have a comparative scale of their relative value.

The CHAIRMAN said on the scale before them one degree was equivalent to six grains to the ounce; and if they multiplied the decimal of the specific gravity by six, they would get the exact number of grains to the ounce. For a collodion nitrate bath that instrument was of course perfectly useless.

Mr. HUGHES read a paper, entitled *Remarks on Mr. Cramb's Paper on Testing used Silver Baths.* [See page 84.]

Mr. DAWSON then read a paper on the same subject. [See page 103.]

The thanks of the meeting were passed to Mr. Dawson for his paper.

The CHAIRMAN observed that at the last meeting Mr. Hill had suggested that the coagulation of the albumen might cause the paper to retain in its interstices nearly all the nitrate of soda formed. The hydrometer would only show a balance of errors; but it was precisely that balance they wished to arrive at.

Mr. MOENS said the hydrometer was much used abroad, and a professional photographer that he had met at Athens constantly availed himself of the instrument. The gentleman stated it answered his purpose perfectly, and he always employed it for making up his baths, so as to dispense with weighing out the materials. He even used it for testing collodion baths, being quite satisfied if the reading did not indicate the solution to be *below* a certain strength.

Mr. HUGHES mentioned that he had tested the same baths as those experimented on by Mr. Cramb, and he had found the results very different from those stated.

The CHAIRMAN announced the presentation of pictures to their portfolio by Mr. Lander and Mr. Mainwaring—those presented by the latter being coloured photographs of prize fruit and flowers.

Mr. HILL stated that Mr. Wilson, who was printing the photographs for presentation to the members, had been hindered by the unfavourable state of the weather; but they would be ready by the next meeting.

The CHAIRMAN said, as it was the evening for proposing the names of members to be elected as officers of the association for the ensuing year, it would be better to proceed with the nomination of the gentlemen to fill the place of the officers about to go out by rotation. Any number of members might be nominated, out of which the officers for the ensuing year would be elected at their next meeting.

The following gentlemen were then nominated:—As *President:* Mr. Woodward. *Vice-President:* Mr. Moens and Mr. Shadbolt. *Treasurer:* Mr. Hill. *Honorary Secretary:* Mr. Barnett. *Committee:* Messrs. Bingham, Nicholson, W. W. King, Dawson, Hughes, Barber, Goslet, Shave, Simpson, Mainwaring, Morley, Bedford, and Moens. *Auditors:* Messrs. Bingham and Foxley.

Mr. HUGHES gave notice that he should propose, at their next meeting, that the number of members of the committee be increased from six to eight. He also thought it advisable that an experimental committee should be elected, after the example of the South London Society.

Mr. HILL intended to propose that they should have a photographic album, in which unmounted prints should be preserved.

The CHAIRMAN announced that at their next meeting a paper, by Mr. Glover, of Liverpool, would be read, *On the Resin Dry Process;* and also a short note from Dr. Maddox, *On a Peculiar Action of a Dry Plate.*

Mr. HILL produced some negatives from plates preserved with pale ale.

The proceedings terminated with the usual vote of thanks to the Chairman.

NOTICE.

ON the 27th instant, the last meeting for the present year will be held at Myddleton Hall, Islington, at eight o'clock in the evening, when the Annual Report, and a statement of the financial affairs of the Association, will be laid before the members.

It is expected that the presentation photographs will then be distributed.

The subscription for the ensuing year falls due on that evening, and the Treasurer and Secretary will be in attendance to receive the same.

Ladies and gentlemen who contemplate joining the Association are informed, that amongst the many advantages enjoyed by members, the following may be enumerated:—

The delivery of THE BRITISH JOURNAL OF PHOTOGRAPHY (post free) fortnightly, from April 1st to the 15th March following inclusive.

A copy of a selected photograph, by Wilson, F. Bedford, or other well-known artist.

The privilege of introducing a member at each meeting of the Association.

And the use of the portfolio of the Association, containing productions by many of the best photographers of the day.

The subscription is 10s. 6d. per annum, payable in advance.

All communications may be addressed to the Secretary, Mr. John Barnett, 9, St. Peter's Terrace, Islington, N.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary monthly meeting was held on Wednesday the 6th inst.,—Joseph Sidebotham, Esq., in the chair.

Mr. F. R. Fielder and Mr. C. J. Simpson were elected members.

Mr. Brothers presented the Society with two copies, twenty-three by eighteen, of old engravings. The negatives were taken with an orthoscopic lens of eighteen inches normal focus, the originals being about three inches larger than the copies. The prints showed evidence of exceedingly uniform illumination and freedom from distortion, the marginal lines being perfectly straight and square. The manipulation of plates of this size was considered a matter involving much difficulty; and the best thanks of the Society were accorded to Mr. Brothers for his valuable addition to the portfolio.

Mr. Parry having taken the chair, a paper was read by Mr. SIDEBOTHAM, *On some of the Causes of Distortion in Photographic Portraits.* [See page 102.]

Mr. BROTHERS said that he had brought some photographic portraits, thinking that they would, perhaps, serve to illustrate remarks which might be made in the discussion of Mr. Sidebotham's paper; but, not having been aware of the point upon which the argument would turn, his selection had been made at random. In the portraits he produced he believed that no distortion of any moment could be perceived. He was quite aware that such defects were frequently seen; but he believed that much depended upon the lens used, and he thought, if operators were careful in their choice, that most satisfactory portraits might be taken with a large aperture of the ordinary character. He believed that sitters often complained of their portraits making them look too stout, for the purpose of saying something; but supposing it to be really so, the increase would be in the same proportion for all persons.

Mr. SIDEBOTHAM remarked that the question of good and bad lenses did not bear upon his argument. In order to test his theory, any lens might be employed and its capabilities ascertained with the ordinary stop, as compared with the arrangement he proposed. His argument was briefly this: that in taking a portrait with a small aperture the rotundity is lost, because the effect is that which we should get by viewing the object with one eye only. If a large aperture were used, then the rotundity was obtained; but distortion arose from the fact that a stereoscopic effect, in a vertical direction, exists. With his form of stop the picture was taken by an aperture corresponding to the arrangement by which they perceive the sitter.

Mr. BROTHERS doubted whether he should be able to work in his glass room with so narrow an aperture as that recommended.

The SECRETARY said that Mr. Sidebotham's theory carried truth with its enunciation. It appeared to him to be one of those things that was simple enough when found out, but which everybody had been in search of until then without success. In reference to Mr. Brothers's remark that there would be a want of light, he observed that, to carry the principle out perfectly, the opening should of course be the diameter, in a vertical direction, of the pupil of the eye, and the length the distance of the eyes apart; but in practice these dimensions might probably be enlarged without any perceptible loss of truth.

Mr. NOTON said he was glad to find that the subject of stops to lenses had been so ably taken up by Mr. Sidebotham. It was a matter of gratification to him, for it would be recollected that he had himself brought the matter before the members some time ago; and, although he had not hit upon the theory and shape of stop which had that evening been made known, he had worked in the same direction, and therefore felt a peculiar interest in it.

Mr. OFFER said that this was a matter of much importance; and if Mr Noton would review his labours, and bring the subject before the next meeting, the whole question might then be discussed, with the advantage of experiments which would doubtless, in the meantime, be made.

On that understanding the discussion was adjourned.

The SECRETARY said that Mr. Noton, who first constructed a rotatory beater for albumen, would then introduce to the meeting a *Plate-holder*, of novel arrangement.

Mr. NOTON then explained to the members the salient points of his new *Holder.* [See page 105.]

The SECRETARY said that, if the expense of making these instruments were not too great, they would prove exceedingly valuable. He had tried that now exhibited, and had found that the plate was held with a pressure, at the commencement, of about ten or eleven pounds to the inch,

and so gradually was that pressure reduced that he had removed a plate and replaced it fourteen times without a second use of the air-pump.

Mr. NOTON thought there would be no complaint of the price if a number, say one hundred, could be made at a time.

Mr. BROTHERS begged to propose a vote of thanks to Mr. Noton for introducing his new holder to the members. From that gentleman they were frequently receiving valuable assistance, and they had never heard anything from him about patents.

The proposition was carried by acclamation.

Mr. OFFER exhibited a print, upon a collodio-albumen plate, which had not been sensitised a second time. The plate was exposed by mistake; and, although the exposure might be considered somewhat under the mark, yet the plate was evidently nearly as sensitive as it would have been under the full preparation. The result was so contradictory to accepted rules, that it was thought desirable to wait for proof by further experiments.

The SECRETARY said that before the members separated he wished to draw their attention to an article by Mr. Sutton in the *Photographic Notes* of the 1st instant, calling in question certain statements made by Mr. Hooper at their last meeting. In a matter like that, affecting the credit of one of their own body, he thought it but right that an opportunity should be afforded him of entering into explanations.

Mr. HOOPER having been called upon, said that in the explanation which he was permitted to make, he should confine himself strictly to the facts as set forth by Mr. Sutton himself in the voluminous heap of letters he held in his hand. In July of last year he had been so captivated by the glowing description of the extraordinary qualities and properties of the new panoramic lens which had from time to time appeared in the *Notes*, but particularly by that at the head of an advertisement in the now defunct *Photographic Quarterly Review* for June, that he was anxious to become the fortunate possessor of one. On referring to the advertisement for price, &c., he found two sizes mentioned—one, No. 5, four inches diameter, eleven inches focus, for pictures 20×9, price £10. The other, No. 7, five inches diameter, sixteen inches focus, for pictures 30×14, price £16. The latter lens was the one he wished to have, and he immediately entered into correspondence with Mr. Sutton respecting it, stipulating that it should be of the quality and possess the properties attributed to it; but did not, as Mr. Sutton would have his readers infer, propose to pay less than the advertised price, £16. He was then, to his surprise, informed that it would have to be made, and, moreover, that he (Mr. Sutton) could not guarantee that it would be of the focus or produce the size of picture mentioned; and also that it must only be considered as a cheap substitute for the right thing, which would cost about £50. In a subsequent letter, however, he said he would supply a lens which should have all the qualities named, with the exception of being slow in its action, and producing a picture slightly less in diameter than 30×14. These conditions were accepted; but, the lens not coming to hand after a reasonable time had elapsed, a long correspondence was the result, in which Mr. Sutton described certain unforeseen difficulties in obtaining a suitable glass. At last, on or about the 1st December, a lens arrived. It was at once tested, but the definition and sharpness was so defective, that he found it necessary to return it. Soon after this, Mr. Sutton wrote requesting permission to make another trial, attributing as the cause of his former failure striæ in the glass, and at the same time strongly advised that he (Mr. Hooper) should take back the rejected lens, which he might have for £10. This offer was refused, but consent was given for another attempt. This, he was informed, had failed, and then another also, until he was told at last that altogether "*four lenses have failed and have been put under the hammer. We are trying a fifth.*" The principal cause of these failures he attributed to striæ in the glass. Mr. Hooper then went on to say that he was quite willing to leave it to the members to say whether he was not justified from the facts in making the statement he had done, and, in conclusion, would beg to suggest to Mr. Sutton that, before so flatly contradicting statements made at any Photographic Society, he should first assure himself whether such were incorrect or not. What he (Mr. H.) had said respecting Mr. Grubb's lens taking in an angle of sixty degrees, he was prepared to prove by one he had in his possession, or by prints taken by others, including that angle in which the "*frightful amount of distortion*" does not exist. He had written to Mr. Sutton requesting him to insert a reply in his next issue.

A MEMBER suggested the impolicy of Mr. Hooper taking that course, for he was afraid that he would find himself in the same position as the man in his encounter with the miller.

The meeting was then brought to a close by a vote of thanks to the Chairman.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A MONTHLY general meeting of the members of this Society was held on Tuesday, the 26th ult.

The usual preliminary business having been disposed of,

Mr. JOHN THOMAS BROWN, jun., the Hon. Secretary, called the attention of the members to the proposed Photographic Exhibition, to be held in Paris this year, and also to the great International Exhibition in 1862, and expressed a hope that the Birmingham Society would be well represented, at least on the latter occasion.

A short discussion followed upon the subject of copyright and its infringement by photographers, not only as regarded the reproduction of engravings, but of the works of photographers.

Mr. ROBINSON exhibited copies of his *Holiday in the Woods* and *The Top of the Hill;* as also a magnificent coloured portrait. He also showed a very ingenious arrangement of a shutter for instantaneous exposure, the invention of Mr. Bright, of Leamington.

Mr. J. T. BROWN, the Hon. Sec., read a paper on the now very interesting subject of *Art-Photography.* [See page 103.]

A discussion followed the reading of Mr. Brown's paper, in which the members present took part.

After a vote of thanks to Mr. Brown, the meeting was adjourned until the 26th inst.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

THIS Society held its annual meeting on Thursday evening, the 7th instant, in the Religious Institution Rooms,—John Kibble, Esq., President of the Society, in the chair.

After the minutes of the preceding meeting had been read and approved, the Secretary read the subjoined letter from Robert Hunt, F.R.S., F.S.S., &c., in acknowledgment of the intimation of his having been elected an honorary member of the Society:—

Museum of Practical Geology, Jermyn Street,
London, 25th January, 1861.

DEAR SIR,—May I ask you to convey to the Members of the City of Glasgow and West of Scotland Photographic Society my thanks for the honour they have done me in electing me an honorary member of that Society.

For many years I have been so entirely removed from the field of photographic research that I feel the more entirely the kindness which has awakened the memory of my work in the early days of the art.

Allow me also to express my thanks to you for the kind manner in which you communicate the matter to me.—I am, dear Sir, faithfully yours,

John Cramb, Esq. ROBERT HUNT.

Some rather disagreeable discussion then followed on the subject of reporting; but nothing was agreed on, and the settlement of the question was delayed.

Mr. J. Steel was elected an ordinary member, and several new members were proposed.

The Secretary and Treasurer read highly favourable reports of the progress of the Society during the past year, which were both approved of.

It was agreed to add two additional members to the Council of the Society.

The following gentlemen were elected office bearers for next year:—

President—JOHN KIBBLE.

Vice-Presidents—A. MACNAB and HUGH WILSON.

Treasurer—ARCHIBALD ROBERTSON.

Secretary—JOHN CRAMB.

Council—

JOHN JEX LONG.	ANDREW MACTEAR.	DUNCAN BROWN.
JAMES EWING,	JOHN SPENCER, Jun.	GRAHAM GILMOUR.

Auditors—JAMES CRAMB and ROBERT LECK.

The SECRETARY intimated that the large and handsome black board which was placed before them was a gift from Mr. John Jex Long.

On the motion of Mr. STUART, a cordial vote of thanks was passed to Mr. Long for his useful and opportune present.

On the motion of Mr. JOHN CRAMB, seconded by Mr. A. MACTEAR, the Society then unanimously appointed the following gentlemen as a Committee to investigate and report on the subject of the hydrometer silver meter and the testing of used baths:—Messrs. Andrew Mactear, John Jex Long, A. Macnab, James Ewing, John Stuart, John Cramb, and James Cramb; Mr. John Cramb convener.

After passing a cordial vote of thanks to the Chairman the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THIS Society met on the evening of Wednesday, the 6th inst.,—the chair being occupied by the President, J. D. Marwick, Esq.

The following gentlemen were ballotted for, and admitted as members of the Society:—James Barlas, Secretary of the Scottish Union Insurance; George Rowe, Master of John Watson's Institution; David Cousin, City Architect; Thomas Knox, Hanover Street; William Troquair, Stockbridge; John French, Graham Street; James Cownie, South Bridge; Alexander Lindsay, North Bridge; John Nicol, Chemist; John Horseburgh, Photographer; and George Inglis, Photographer.

This meeting was mainly occupied in the adjustment of laws, bye-laws, and other routine business attendant on the formation of a new Society.

It was agreed that the next meeting should assume the form of a *conversazione*, in Queen Street Hall, on which occasion the President would deliver an inaugural address.

It was also resolved that a number of photographs, &c., should be exhibited, to arrange which a committee was appointed; and it was intimated that, for that occasion, each member would be at liberty to invite two or three friends, cards for which purpose would be sent them in due time.

The Secretary announced that several gentlemen had kindly offered to read papers on various practical subjects connected with photography, which were to be experimentally illustrated as far as was deemed necessary. The first of this series is to be by Mr. Archibald Burns, *On the Fothergill Process.*

After a vote of thanks to the Chairman, the meeting separated.

BRADFORD PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on Wednesday evening, the 6th instant, at the Rooms, Chapel Houses, James Street. The President, Dr. R. Parkinson, took the chair.

The minutes of the last meeting having been read and confirmed, Mr. Appleton and Mr. Burrow were proposed, and unanimously elected members of the Society.

The President called upon the committee appointed to test the instantaneous stereoscopic lens, by Ross, to report the result of their experiments.

Mr. Stanley, for the committee, said that the weather had been so very unfavourable for "out-door" photography, that no good or quick result had been obtained; and, for that reason, the committee declined giving a decisive answer until the next meeting.

It was resolved to add the new edition of Mr. Hardwich's *Photographic Chemistry* to the Society's library.

The thanks of the meeting were awarded to several of the members for their very liberal contributions to the Society's portfolio; also to the President, for exhibiting a very beautiful stereoscopic camera, which was much admired for its lightness and portability.

Mr. S. H. Stanley then addressed the meeting on the subject of

Dry Plates.

It was the remark, I believe, of William Pitt, upon one occasion, in the House of Commons, that when a man had nothing to say on a given subject, the best thing he could do was to say nothing. This remark may in some measure apply to myself, having little or nothing new to communicate to you on the subject of Dry Plates.

We will, however, take exception to this rule, as in all newly-formed photographic societies there are some volunteers; and those who have only recently joined the ranks may be glad to profit by the experience of those who have trod what certainly used to be the "up-hill" path of the dry process in this enchanting art. For such, and such only, are the practical details I am about to submit to your attention intended. Our Society is yet very young, and I trust each member will give proof of his desire to promote its welfare by communicating to the members the results of experiment and practice.

It has been suggested that, for the benefit of the junior members, I should this evening go through the working details of the process I employ. It may not be the best; but, having found it more than answer my early expectations, I have continued to adhere to it. Some negatives are now on the table for your inspection which speak for themselves, and which, for an amateur, will bear critical examination: they are sharp and clear, and as full of half-tone as any person could desire. There are also a few prints from the same, which I have great pleasure in presenting to the portfolio of the Society.

You have all had sufficient experience in photography to know that the plates must be scrupulously clean, and also to be acquainted with the method of cleaning them. I shall therefore proceed at once to the bath, which I prepare with thirty-five grains of nitrate of silver to the ounce of water, and about half-a-drachm or more—probably one drachm—of Beaufoy's acetic acid. When I say it is now about two years since I prepared the bath, I may have made an error in the quantity of acetic acid; but, that it contains a large amount, you will perceive by the smell, without the aid of test-paper. I am aware that a neutral bath is now advocated, and am willing to give it a fair trial. I have, however, found this bath work very well, but shall have no objection to change it for a better.

I use a "rotten" collodion, sensitising with cadmium. The plates are allowed to remain in the bath about two or three minutes; then immersed in sufficient water to cover them in a flat dish, gently removing the free nitrate by moving the dish backwards and forwards. I then place them in a second dish, containing sufficient prepared albumen to cover them, in which they remain until another plate is placed in the bath. I then agitate the albumen bath pretty freely for half a minute; take out the plate; wash in about half a pint of water, and dry.

The albumen is prepared thus:—

White of egg	1 ounce.
Water	10 ounces.
Liq. ammonia	½ ounce.

Shake well together, and strain.

The time of exposure with a Ross's stereo. lens, one quarter-inch stop, in tolerably clear weather, is two minutes. Develop the latent image with

Pyrogallic acid	2 grains.
Beaufoy's acetic acid	1 to 2 drachms.
Water (distilled)	1 ounce.

I have no doubt that, with a little practice, this will be found a safe and easy mode of operating.

At the close of Mr. Stanley's paper, a very animated discussion arose thereon, tending to solve many difficulties apparent in the Fothergill dry plate process.

The usual vote of thanks having been given to Mr. Stanley for his valuable paper, the meeting separated.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

A monthly meeting of this Society was held in the Tower, New Bridge Street, on Friday, the 1st inst. Mr. G. C. Warren, one of the Vice-Presidents, occupied the Chair.

The Chairman read the following list of new members, who had been elected since the December meeting:—The Right Hon. Sir Frederick Pollock, Lord Chief Baron (patron); Right Hon. T. E. Headlam, M.P.; Sir David Brewster; the Rev. J. C. Bruce, A.M., LL.D.; the Rev. John Lockhart, A.M., D.D.; A. H. Wall, Esq.; F. Joubert, Esq.; Thomas Sutton, Esq., A.B.; T. Ross, Esq.; Dr. Hill Norris; G. Wharton Simpson, Esq.; George Shadbolt, Esq.; J. Dallmeyer, Esq.; James Dewar, Esq.; Jos. Watson, Esq.; and David Zenner, Esq.

Mr. Thomas Davidson (formerly of Edinburgh), read a paper *On the Position Diaphragms should Occupy in View Lenses.* He illustrated his paper by reference to diagrams, pointing out the correct position the diaphragm ought to occupy, and showed that the distance a diaphragm should be from the lens, to be thoroughly effective, must be regulated according to the size, aperture, and the focal length of the lens. The larger the diaphragm used, the nearer it should be placed to the lens; the smaller, the farther from it. Some opticians, he stated, had their diaphragms to slide or turn round in front of the lens, and at equal distances from it, whatever the diameter of their aperture. The impropriety of this was pointed out by reference to the diagrams. It was also shown that, by attempts to secure flatness of field, distortion of the image was produced, particularly towards the margin of the picture, the parts there being enlarged disproportionately to the centre.

When the reading of the paper had been concluded, two views of *The Interior of Whitfield Church* were exhibited by the Chairman. At first these pictures appeared quite useless from being over-printed. They were immersed in moderately strong ammonia, by which they were considerably reduced in intensity; but they still remained flat and mealy-looking. They were then toned in the alkaline gold bath, when he was surprised to find they were converted into very good impressions, possessing much vigour.

Mr. North presented to the portfolio of the Society three very fine pictures. Two of them were copies of drawings in sepia 150 years old; Another was the *Norman Keep* at Newcastle-upon-Tyne; and the other the chapel in the same building.

Mr. Laws exhibited some beautiful transparent slides, which were greatly admired, and he promised to explain his method of manipulation at a subsequent meeting.

Mr. Willis and Mr. Anderson laid before the meeting several illuminated transparent slides, which were very pleasing. On the table were also placed an admirable display of large pictures and stereoscopic slides belonging to several of the members, all of which were much admired.

It was announced that the tannin and albumen process would be the subject for the following meeting. After votes of thanks had been cordially passed to Mr. Davidson and the Chairman, the meeting was adjourned to the first Friday in April.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

ON PAINTING THE NECK, BOSOM, AND SHOULDERS.

Supposing our specimen to be the portrait of a lady in evening costume, we next proceed to lay in the neck and bust. Here the general tone should be subdued with pearly greys, but all the tints must be very clear, clean, and delicate. From the neck towards the shoulder bones the skin displays a *faint, delicate* blush of pink; but the shoulders—influenced by the bones which there are nearer the surface—grow of an ivory-like hue and appearance. The swelling bust, as it nears the breasts, also becomes more influenced by a just perceptible tinge of the carnations, but chiefly by the pale blue tracery of the veins beneath. Should the muscles of the neck, or the bones of the bust, be too conspicuous, you are justly licensed to soften, conceal, or modify such unpleasant passages with your best skill.

THE HANDS AND ARMS.

The colours used for the face will also be used for the arms and hands; but you will only require a few of them. Let the high lights be well impasted. The same license granted you in painting the bust also extends to the arms and hands. For further information see remarks in previous chapters.

Having got in all your flesh you must now give some attention to the background. As a plain background is all you should at present attempt, I here give the following:—

LIST OF TINTS FOR PLAIN BACKGROUNDS.

Black, White, Indian Red, and a little Vermilion.
Black, White, and Lake.
Black and Burnt Sienna.
Black and Indian Red.
Brown Ochre, White, and Burnt Umber.
Prussian Blue, Ochre, Black, and White.
Terre Verte, Raw Umber, and Burnt Sienna.
Black, White, and Burnt Umber.
Umber and Yellow Ochre.
Black, White, and Burnt Sienna.

The above will provide you with almost every necessary variety. Begin by laying in the darker portions, say with black and burnt umber, using the colour somewhat but not *too* thin, and work gradually with lighter tints towards the head. The background must not be so dark at this stage as it is intended to remain. It should be varied in colour, although harmonious in effect, relieving the head, but not cutting hard and sharp against the hair, &c. [See previous directions for the management of backgrounds, and also the maxims.]

DRAPERY.

I have said much already on this subject, too, so that what I need now add must merely refer to the manipulatory and mechanical methods to be adopted.

TINTS FOR DRAPERIES.

Linen.

White and Blue Black.
White, Black, and Burnt Umber.
And White for the lights.

White Satin.

White.
White, Raw Umber, and Ivory Black.
White, Black, and Indian Red.
Brown Ochre, White, and a little French Blue.

Blue Satin.

Prussian Blue, and White.
Ultramarine, and Blue.
Ivory Black, Ultramarine, White, and a little Vermilion.
Brown Ochre, Ultramarine, and White.

Scarlet Coats.

Crimson, Lake, and King's Yellow.
Crimson, Lake, and Vermilion.
Vermilion.
Crimson, Lake, and Indian Red.
Extract of Vermilion.
Carmine, and Yellow.

Black Cloths.

Lake, Vandyke Brown, and Indigo.
Black, White, and a touch of Venetian Red.
Black, Blue, and White.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

G. S.—You will never preserve the likeness if you work so carelessly. You get so much colour on the lights that the first sweep of the softener destroys your outlines and half-tints, and then you have evidently not the knowledge of drawing wanted to enable you to recover what you have thus lost. Boldness is a very good quality, but rashness is folly; and although timidity may retard modesty, prudence will advance your efforts to the proper goal.

A LITTLE PUPIL AND GEORGE L.—See the above reply. The class I then named is now in existence, and meets every Tuesday and Friday, at ten o'clock in the morning, at 28, Old Bond Street, London.

M. H.—Too timid. Use rather more colour, as the first application of the softening brush must leave your paper nearly bare.

W. M. (Guernsey).—I will write to you in a few days. Pardon my long delay.

Foreign Correspondence.

Paris, March 11, 1861.

YOU were somewhat hard upon me in the leader of your last number, but I am far from irate thereat; for I have always held and avowed that in matters of science, as in politics, freedom of discussion is indispensable to progress. I trust, however, that you will allow me to reply for the last time; for the best things may last too long. First, then, with respect to the debate at the French Society of Photography, I repeated to you *what I had heard*, and that as faithfully as it was possible to do. Secondly, M. Leon Foucault did conclude, as I announced to you, in the same way as M. Claudet. Thirdly, if the note given by M. Foucault in the *Bulletin* adds many things which were not said by him before the Society, and which militate against M. Claudet's conclusion on the excellence of the solar camera—a contradiction on M. Foucault's part, as it appears to me—I am not responsible for that; for, of course, I could not report to you what I had not heard. Lastly, as regards my own judgment on Woodward's apparatus, you let it be clearly seen that you do not consider me sufficiently competent in matters of optics to give a serious opinion. But I see that you likewise reject the judgment of M. Claudet, whose competence cannot be put in question, and that you also charge M. Foucault with an error. I confess that it consoles me to find that, if I err, I err in such goodly company. Further, I shall be the first to acknowledge my error, and to manifest due contrition, when I shall be shown amplified pictures superior to those obtained with Woodward's apparatus. Certainly, theories have their value, but results have theirs also; and I shall always be disposed to prefer an ill-constructed instrument which produces excellent works to the most perfect apparatus from a theoretical point of view, if it leads only to disappointment and failure. I know not if such was the disposition of the "Old Lady" spoken of in the above-mentioned leader, but certainly it is that of many of my friends, the photographers.

So much said for my own satisfaction, and with the firm desire of satisfying every just susceptibility which my ill-fated report of the famous meeting may have aroused, I resume my course by again speaking of an apparatus. This time, however, I will keep on my guard, and will content myself with describing what I have seen, without delivering any judgment.

The instrument in question is the automatic regulator of M. Serrin, which the inventor exhibited the other evening before our Photographic Society.

The object of the instrument is so to regulate the electric lamp that the luminous point may always remain fixed; that the charcoal points may remain at the same distance from each other, notwithstanding their constant consumption; and, lastly, that the light may be let on and let off, so to speak, at a distance from, and without touching, the apparatus. The mechanism is very simple, being a sort of balance, inclining now to this side now to that, so as to establish the equilibrium necessary to the production of a fixed luminous point. It is composed of two parts, distinct but dependent upon each other, inasmuch as the functions of the one commence where those of the other cease. The first part, the oscillating system, produces the separation of the charcoal points which are in contact when at rest, and brings them together when the too great separation would stop the production of light. The second part, depending on the first, has for its object simply to bring together the charcoal points. The two tubes containing the charcoal are placed perpendicularly, the one above the other: the upper one communicates with the positive pole and the lower one with the negative pole, by means of the movement and of the oscillating system. The upper one, in descending, by its own weight causes the other to rise; but this movement is regulated in the proportion of two to one, the consumption of the former being twice as rapid as that of the latter.

The oscillating system forms a rectangle with articulated angles, and two vertical and two horizontal sides. One of the vertical sides is fixed, the other is moveable, and hung very delicately, so as to yield alternately to its own own weight, bringing it downwards, and to a spring which propels it upwards. This same oscillating system bears at its lower extremity a soft-iron armature, connected with an electro-magnet, which the passage of the current from the pile renders active. When the current is not passing, the two charcoal points touch; but, as soon as the electro-magnet becomes active, the armature is attracted downwards, and with it the oscillating system and the lower charcoal point, which latter is thus drawn away from the upper point, remaining motionless, and the arc and the electric light appears between. As the points are consumed their distance augments, the current grows feeble, the electro-magnet less powerful, and the armature is less attracted. Immediately the oscillating system rises, and in so doing sets free the movement, and the points are brought together again. More exactly, however, it is the play of opposite tendencies, neutralising each other at each instant, and maintaining the points at a determined distance so that the electric light may have its maximum intensity, so far as the slow combustion of the charcoal is con-

erned. Should any extraneous cause intervene—should one or oth of the charcoal sticks break—the current is abruptly arrested, he electro-magnet becomes inert, the armature is liberated and ises with the oscillating system; the movement is set free, the harcoal sticks come into contact, the circuit is closed, the armature s attracted downwards, and, with it, the oscillating system; the ipper charcoal stick stops the lower one retreats, and the lamp ights up again.

This lamp admits of various applications; but, of course, we ave merely to consider it from a photographic point of view. It ives a very intense light; and its remarkable constancy allows ictures, even negatives, to be taken in a very short space of time.

I spoke some time back of the *Galerie des Contemporains* which Disderi had begun, and of which many numbers have now been ublished. Pierre Petit has just commenced a publication of imilar character, but in a more costly style. His portraits of our elebrities are unusually large, and the accompanying text is very andsomely printed on folio pages. The high price of the work five francs a number) will naturally limit the subscribers to the vell-to-do classes of society; but the work is one that will do onour to photography.

Several officers belonging to different corps have for some time een taking lessons of Disderi. A speedy organisation of this ranch of instruction for military men is under consideration. Several projects are spoken of, but as yet nothing official has been announced.

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

SUGGESTIONS FOR A LENS COMMITTEE.

To the EDITOR.

SIR,—Permit me to ask you if there is any chance of the London Photographic Society appointing a Committee to test the merits of the various lenses now in use? It appears to me (with all deference to Mr. Hardwich) that a Committee of this kind would have been of far more service to the general mass of photographers than the late Collodion Committee. A photographer could, for the outlay of a few shillings, procure samples of all the best collodions, and could select that which pleased him most; but with lenses it is quite a different matter. In that case it is a question of pounds; and as the opinions of those upon whom the amateur generally depends (the editors of the journals) differ very materially upon this subject, the appointment of this Committee would, I think, give universal satisfaction. The lenses should not be sent in specially from the maker for this purpose; but one should be procured from each manufacturer without his knowing the purpose for which it was required, in order to ensure a fair average sample, such as a private person would be served with. The funds of the Photographic Society would surely bear this expense; and if a moderate size were adopted, say for pictures 10 by 8, no doubt some half-dozen or dozen of our best men would undertake the trouble and give us a report before the present year was too far advanced. If there is no delicacy in recommending a particular maker's collodion, surely the same rule can be applied to lenses. I am not interested in a *business* way at all in giving the above suggestion, but have been hesitating some time what lens to purchase; and, having heard the above remarks made by others, I thought if the matter were agitated a little something might be done to allay the existing perplexity. Pray, Sir, take up the question.—I am, yours, &c.,

LENS.

P. S.—Could you kindly inform me the reason why so large a portion of acetic acid is added to the bath when albumen plates are employed? And also what kind of acid is meant, as there are three kinds in chemists' catalogues—1s. per ounce, 6d. per ounce, and 2d. per ounce—all called *glacial?* Would not a small portion of nitric acid do as well? In sensitising paper for printing, the bath does not contain so large a quantity of acid, although albumen is largely present.

[We rather imagine that such a Committee would give almost universal *dis*-satisfaction, even if appointed, of which, however, we have no expectation. Without the sanction of the various lens makers whose goods were to be operated upon we scarcely think the Society would be justified in publishing such a report as is contemplated; and it would be questionable whether, if this were to be done, somebody would not be liable to an action for damages by those whose goods were depreciated.

An opinion by an *individual* might be legitimate enough; but that would scarcely satisfy our correspondent, as he has that already. He must just elect for himself what lens he will purchase, or else make up his own mind in whose opinion he can best confide.

Acetic acid is introduced to preserve the film from browning by lapse of time when not exposed to light, and could not be replaced by nitric acid, as the latter would also materially reduce, or, perhaps, altogether destroy the sensitiveness. *Glacial* acid is that which solidifies at about fifty degrees of temperature, and is stronger than the others quoted.—ED.]

RECOVERY OF SILVER.

To the EDITOR.

SIR,—I put twenty ounces of silver solution in a bottle, and put the bottle and solution in a pot of boiling-hot water, to evaporate the ether; it had not been in the bottle long before it broke, and all the solution was in the pot with the water. I precipitated the silver with common salt, and I found a black powder at the bottom.

Please to inform me, through your valuable Journal, what I must do with it to make it fit for use again. Thanks for many past favours.

I am, yours, &c., A. B. C.

P.S.—I have kept it from the light ever since.

[Wash the deposit two or three times with water, dry, and mix it with twice its weight of carbonates of potash and soda together, and put the whole into a Cornish crucible. Place the crucible in a glowing fire, and raise the heat to a bright redness. Remove the crucible, and, *when cool*, break it: a lump of metallic silver will be found, which may be dissolved in nitric acid.—ED.]

PRINTING TRANSPARENCIES.—RECOVERY OF WASTE SILVER.

To the EDITOR.

SIR,—Will you kindly oblige me with the best formula for printing glass transparencies, also the best method of recovering silver from old sensitised and filtering papers, or if I shall be able to find it anywhere in your valuable Journal?—I am, yours, &c., A BEGINNER.

[Printing by direct contact in the pressure-frame upon albumenised glass is perhaps the *best* method; but any of the dry processes will answer. You must, however, be careful that the glasses for both negatives and positives are perfectly *flat*. To recover your waste silver from paper, burn them, and collect the ashes, which mix with twice their weight of nitrate of potash. Make a crucible red hot, and throw in the mixture little by little: slight detonation will occur at each addition. When all is used up, remove the crucible to cool, and a small network of silver will be found at the bottom. We strongly advise you to procure a copy of Hardwich's *Manual*, sixth edition, just published: it contains all you can wish to know on both these subjects.—ED.]

OPTICAL, &c.

To the EDITOR.

SIR,—Your remarks on the use of a central diaphragm would lead one to infer that Mr. Archer was the first to use it. I, however, first saw it used in the photographic establishment on the front of the Rotunda, in Dublin, by the Chevalier Debruil, in the year 1841.

I may also remark that Mr. Archer's paper on collodion photography was not the first published account in England. Mr. Willat published a little pamphlet—a translation of Le Gray—early in 1850, which our late respected brother photographer, P. W. Fry, sent to me early in that year, in which the use of collodion and sulphate of iron is plainly stated by Le Gray. The mixture of pyrogallic acid and sulphate of iron with acetic acid I first saw used, as a developer, by Mr. T. Pain, then Mr. Kilburn's operator, in 1851. He had the formula from Horne and Thornthwaite, with the first bottle of collodion he purchased.

And now I shall thank you to answer me an optical question. With the front achromatic lens of Chevalier's combination,* which is about three feet focus, I have measured the images on the ground glass. They appear to be about the same size as the image produced by my eye, measuring them in inches on a straight line. I thus conclude the lens of the eye is three feet focus; but the retina on which the image is refracted is not more than an inch from the lens. How is this shortening the camera without loss of size effected in the eye? and could not the same or a similar plan be adopted in photography?—I am, yours, &c.,

ANTIPODES.

[If you refer again to our article you will perceive that we simply pointed out the fact that the use of a diaphragm between the components of a double combination lens, in order to remedy distortion, was *at least as old* as the time indicated; for we expressly remarked that we were not claiming the *discovery* of the property for Mr. Archer.

In reply to your query, we must state, first of all, that we have no doubt that you have committed an error in supposing that a lens of three feet focus will cover a circle of six or even five feet in diameter; but that is immaterial to our present inquiry.

* Covers a circle from five to six feet in diameter.

You are confusing yourself with the subjects of *real* and *apparent* size. You do not suppose that the *real* size of the image of a distant object (say 100 yards off), formed by a lens of thirty-six inches focus, will be equal to that of the object itself. If you do, measurement would soon undeceive you. Therefore it is the *apparent* size only to which you can refer; but the apparent size depends upon the distance from which you view an object, or, to put it in more accurate phraseology, the angle of vision, subtended by any object, increases as you approach towards it.

If, then, you view an object from any point, and also view the *image* of it, formed by a lens of thirty-six inches focus, the eye being at a distance of *three feet* from the image, the sizes of the object and image will *appear* to be equal—that is, they will subtend the same angle of vision. So also will be the case if an image formed by a lens of twelve inches focus be viewed from a distance of *one foot;* but if, in viewing the former image, you approach to within *two feet* of it the image will appear larger than the object, while if you retire to a distance of four feet it will appear smaller. The same things will occur with a lens of twelve inches, or any other focal length; and, in general terms, we may say that *images viewed from a distance corresponding to the equivalent foci of the lenses producing them, will subtend the same angle of vision as the objects themselves viewed from the positions of the lenses.*—Ed.]

NEGATIVES.

To the Editor.

Sir,—From what I have seen of photographic negatives, it seems to me that you can produce two different sorts—one looking, by transmitted light, dark and grey, the other a white shade, more like a "positive" tint. I should be much obliged if, in your next number, you would say how to arrive at the blackish tint, because all the negatives I have seen taken by artists in the trade are of that tint, and consequently I infer that they are most perfect; but all the negatives which I have taken, although they print tolerably well, have very white lights and half-tones, and you can see more of a "positive" picture in them, viewed by reflected light, than those taken by professors. I expect to find there is something wrong in the bath or developer. The solutions I use are:—Bath: slightly acid with acetic, one ounce water, thirty-five grains silver, half a grain iodide, and five drops alcohol. Developer: one grain pyrogallic acid, twenty drops glacial acid (thirty-eight degrees), and fifteen drops alcohol,

I am, yours, &c., A SUBSCRIBER.

[The best negatives by *reflected* light appear of a dull orange colour, the details being indistinct: those of a blue-black look intense, but are not so in reality. The bath is probably too acid: you may nearly neutralise it with carbonate of soda. The addition of alcohol is totally unnecessary. For your developer, omit the alcohol and use instead ten drops more of acetic acid—making thirty drops, or rather *minims*, in all. Push your development until the shadows just begin to fog.—Ed.]

SOUTH KENSINGTON AGAIN!

To the Editor.

Sir,—I enclose copy of an advertisement from the *Daily News*, which, perhaps, you have not seen:—

PHOTOGRAPHS of TURNER'S LIBER STUDIORUM.—The SCIENCE and ART DEPARTMENT of the COMMITTEE of COUNCIL on EDUCATION, with the permission of the Trustees of the National Gallery, has produced NEGATIVE PHOTOGRAPHS of the original DRAWINGS of LIBER STUDIORUM of W. M. TURNER, R.A., with a view of supplying schools of art in connexion with the Department with photographic copies.

To enable the public at the same time to purchase copies it is proposed to print and publish positives through the ordinary channels of trade.

Publishers desirous of tendering for printing and selling positives may see specimens of the negatives in the Photographic Rooms, South Kensington Museum, and must send in a tender stating what number of mounted copies they are willing to supply free of charge to the Department in return for the privilege of having the negatives.

They must state at what price they propose to publish single copies, wholesale and retail.

The Committee of Council do not guarantee any copyright in the work, and can give no exclusive right beyond the possession of the negatives, but will not themselves issue to the public any negatives of the Liber Studiorum for a period of three years.

The Committee of Council on Education do not bind themselves to accept the lowest or any tender.

It concedes an important principle—namely: "To enable the public at the same time to purchase copies it is proposed to print and publish positives through the ordinary channels of trade." And tenders are asked for.

To "enable the public" is a strong phrase, and would seem quite to dispose of the question of government monopoly.

But the great injustice to photographers still remains, namely—the fact that all the public galleries under the control of government are closed to all but the government photographer. No tenders are even to be asked for works in that department.

The profession is thus shut out from not only the finest things in the country—which, as part of the public, belong to photographers—but from those very things familiar to the general public, and thus certain to be in general demand. I hope you will say a few words on this subject in your next number.—I am, yours, &c., JOHN SCOTT.

March 6, 1861.

CORRECTION.

To the Editor.

Sir,—I shall be much obliged by your correcting an error at page 90, column 2, line 34, of your Journal, where "Mr. De la Rue" has been taken for "Mr. Dallmeyer." It is obvious, from my remarks, that Mr. De la Rue had stated the fact of more actinism being reflected than light, without any hypothesis to account for it, and that it was Mr. Dallmeyer who was reported to have explained it; but which, for the reasons given, I conceived to have been founded on want of appreciation of the difficulty.

I am, yours, &c., WILLIAM BURR.

GLASS HOUSE.

To the Editor.

Sir,—Will you have the kindness to favour me, through your valuable Journal, with your advice respecting a glass house for taking portraits? I have a shed 16 feet long, 8 feet wide, with a north-east aspect, similar to sketch now enclosed, and I propose putting in a skylight, 6 feet by 8 feet, in the roof, and side-lights, as you will see. The south side and two ends are dead walls. I am rather at a loss to know the proper position for the skylight to produce the best effect. Would the skylight be better for being entirely at the end of the building and all up through the roof? The roof is very flat, about six inches pitch: have I allowed enough room for light? Would you recommend my putting the skylight any larger? The sitter, of course, will sit with the back to the sun. Any suggestion you can give me will be thankfully received.—I am, yours, &c.,

JAMES DATE.

[We recommend you to carry the glass roof *quite up to the east wall*, and, if possible, introduce also four or five feet of glass in that wall towards the north end. It is needless—in fact it is detrimental—to carry the glass farther back on the roof, as a shade over the head of the sitter is a necessity for obtaining artistic portraits.—Ed.]

ANSWERS TO CORRESPONDENTS.

R. B.—We are obliged by your offer; but decline it with thanks.

T. D. (Brighton).—We cannot find sufficient merit to allow us to notice them.

R. F.—Your camera is at fault as regards the position of the ground glass and dark slide, or your lens is not properly corrected.

C. Truman.—We thank you for your kind intention, but fear that the articles proposed would not be suitable to our columns.

Lizzy Lawrence.—Procure some of the dry plates prepared under the patent of Dr. Hill Norris, of Birmingham. See advertisements.

William Judge.—You must vary the quantity of citric acid according to the temperature: from half a grain to two grains will be about the limits for *each grain* of pyrogallic acid, or for *ten grains* of protosulphate of iron. First use the minimum quantity, and try your developer; if it blackens very quickly add another half grain, and so on until you find it works smoothly.

Saml. Swanscombe.—We are not surprised at your obtaining different advice from each of the editors named, because we know that their views differ; moreover, we differ somewhat from both, so that you have only increased your dilemma by applying to us. We advise No. 5. Make up your own mind in whose judgment you have most confidence, and follow his advice in the matter.

William Daniels.—Your proof shows signs of *under-exposure in the negative* and over-development. In all probability you have used collodion that has become highly coloured, and most likely your bath has become *acid*. Test it with litmus-paper, and, if acid, neutralise it with oxide of silver. We have not had time to examine your stereograph, except by a glance; but will advise about that in our next, if needful.

F. B.—We are obliged for your model of an "instantaneous" movement; but the same thing has been long in use, made of metal, wood, or milled-board, with various modifications. That you have sent is absolutely identical with what Mr. Skaife formerly employed under the name of a dart-movement; and a similar one, without the india-rubber band, was made by Murray and Heath, for Mr. Lake Price, some time ago.

An Amateur.—Your negative is very likely not dense enough, and your sensitising bath for the paper has probably become reduced in strength; but we think it likely that the toning bath is also out of order. Have you any deposit therein? If so the gold has been reduced.—Remedy: Make a new sensitising bath; slightly acidulate with nitric acid. Do not examine your proof while printing by daylight; and mix your toning bath only *as wanted*—that is, do not keep it ready mixed.

J. H. Slater.—You have arranged the components of your portrait combination quite correctly in your sketch—that is, with the flattest side of the convex lens towards the ground glass. There is no limit to the reduction in size of your stop, except what arises from making your lens too slow in working; but you will probably find yourself unable to use it less than about one inch for portraiture. It is not advisable to use a second diaphragm in your landscape lens, as indicated in your sketch; but you may, with advantage, line the whole tube with black cloth or velvet.

F. P. M.—You had better purchase a good pneumatic holder or two. We have seen excellent ones at Bolton and Barnitt's, Holborn; Shew's, Oxford Street; Hughes's, Oxford Street, and Murray and Heath's, Piccadilly, London. Probably many other dealers keep them in stock; but the particular kind for your purpose is that with a *lever and catch*, and we know that they can be obtained at any of the above establishments. We quite agree with you relative to your remarks on the shape and type of the Journal, but our Publisher does not. We bow to his superior judgment in that matter.

R. T. Dick.—The albumen process is of older date than collodion, and possesses but two drawbacks, viz., extra trouble in preparing the plates, and slower capability of receiving an impression; on the other hand there are certain advantages not possessed by any other process. We shall have something to state about this in an early number. We do not perceive any particular advantage in the process you have been lately trying. No doubt it answers, but not better or perhaps so well as some others. The preservative would be apt to ferment if kept long in warm weather. We recommend you to try the new tannin process of Major Russell's introduction. See Hardwich's *Manual*, sixth edition.

Received.—"Con Tutto Core."—"A." In our next.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 139, Vol. VIII.—APRIL 1, 1861.

Printing and Toning.—The renewed discussion on this subject at the last meeting of the Photographic Society assumed at one stage a very unsatisfactory tone. In the course of the debate Mr. Vernon Heath alluded to some specimens selected from a large number out of "The Pencil of Nature," which specimens he laid before the meeting. It was natural that this allusion should start our friend, Mr. Malone, full gallop upon his hobby, and that he should tell us—not for the first time—how these proofs were produced; how they had all been put upon a short allowance of water for washing purposes, not more than six gallons in all having been allowed for division amongst twenty-five proofs—that is, something less than a quart a-piece; how they had been toned by sulphurisation arising from the small (!) quantity of hyposulphite of soda left in the paper, aided by a hot iron: we say all this was very natural, but it was not edifying. There is, however, one thing in connexion with this subject that certainly does excite our wonder, and that is, that a man of Mr. Malone's attainments, experience, and observation, should contend that, because one or two, or even ten per cent., of pictures produced by such a method as above described survived to the time of speaking, it should be regarded as any reason for pausing before entirely abandoning such a method of toning in favour of one where the casualties do not exceed, even if they attain to, the same per centage. It is like questioning the insalubrity of a locality where only one person in ten survives an epidemic attack, and condemning the healthiness of another where but one person in ten loses his life. Our worthy predecessor is certainly not to be condemned for any want of caution, as a rule; but we put it to himself whether he has not in the present instance become incautious from his over-caution.

In the friendly controversy upon the same subject which we have carried on with Mr. Heisch the case is widely different: it is a question between the use of sel d'or, aided by sulphur, against chloride of gold in contact with an alkaline salt. We cannot at all regret this discussion, because it has not only induced our amicable opponent to explain more fully his own views than he did at first, but because also it has caused him to draw attention to a probable error of manipulation, which may account for some of the failures in applying the so-called alkaline gold toning process:" we allude to the transferrence of the proof from the toning bath directly into the hyposulphite of soda solution without any intermediate ablution. We may remark, in passing, that although in theory all of the toning solution should be removed from the pores of the paper, we believe that in practice no inconvenience will arise if the proof be left to soak for a few minutes in water between the two operations; because, although a portion of the toning solution, much diluted, will undoubtedly remain in the fabric of the paper, the quantity being very small it will not have a chance of forming any insoluble deposit, owing to the great excess of strong hyposulphite of soda, in which this otherwise insoluble matter is readily soluble.

Mr. Heisch brings against us personally a charge which we are quite convinced he does not intend to convey, when he says that we adroitly get out of answering one of his remarks by taking hold of another. This must surely be a *lapsus calami*, for he would scarcely, in sober earnest, accuse us of arguing to sustain an expressed opinion against a conviction of its error. We have for too many years pursued science in several branches not to know that the ascertainment of *truth* is the only real advantage to be obtained. If the possessor of a lump of yellow dross can persuade his antagonist that it is a veritable golden nugget, to what end is it? It will not, therefore, purchase an ounce more of nitrate of silver. We consequently regard this remark of our worthy antagonist merely as a random shot, without any special intent, and certainly freighted with no malice.

In conclusion, we will notice one more observation, to which we would make a reply. Mr. Heisch says—"I have never met with any paper which would give agreeable tones if left as they (the proofs) come from the gold bath."

If he will try some of Hollingworth's paper perhaps he may find cause to modify this opinion, though after all the whole point may hinge on the interpretation of the words "agreeable tones," as we hinted on a former occasion.

Albumen Process.—On receiving a short time back from Messrs. Negretti and Zambra, the series of Java stereographs noticed in our usual column, Mr. Negretti said much to induce us to urge on our readers the propriety of considering whether or not it might not be worth their while to return to the original simple albumen process upon glass for taking stereoscopic negatives, on account of the much higher intrinsic value which would attach to them over those executed upon collodion or collodio-albumen.

The greater relative value is owing to the fact that the *best* transparent glass slides are obtained by direct contact-printing in the pressure-frame, and that the albumen negatives readily bear this treatment without injury, while the other kinds always suffer more or less under it, even though handled with much greater care and delicacy.

It is, we are told, almost impossible to avoid raising the film and making minute holes in the negatives, excepting those taken upon albumen alone, when used as above indicated, and they have constantly to be patched and touched up, until, after a comparatively short time of usage, they become worthless. It is conceded that the manipulation of simple albumenised plates, as regards preparation, is a little more troublesome than when assisted by collodion—dust being the chief enemy to vanquish; but it is also contended that the additional value, in a commercial point of view, considerably outweighs the extra trouble incurred. Mr. Negretti himself read a paper before the Photographic Society, a few years back, detailing all the manipulations as practised by M. Ferrier, the renowned French operator. It is possible that a very thin preliminary coating of collodion may be less objectionable than one of the ordinary kind. This is a matter that may be worth consideration.

PRACTICAL OPTICS OF PHOTOGRAPHY.—We perceive that we shall certainly have to make a few comments upon some points contained in the series of papers by Mr. Rothwell upon the subject above indicated, now in course of publication in our columns; but as any of a dissentient character might tend to embarrass the author, as well as to confuse the unskilled reader, we have concluded to postpone any remarks of this nature until after the conclusion of the series, and issue for the present only such as may be calculated to illustrate further Mr. Rothwell's demonstrations. To this end then we would draw attention to a method of testing the coincidence or amount of variation of the chemical and visual foci that we regard as simpler, and involving less labour, than that put forth in Mr. Rothwell's current article, and for which photographers are indebted to the ingenuity of M. Claudet. A circular disc of card, upon which has been printed an ornamental pattern resembling engine-turning, with lines of various degrees of fineness, is divided into about a dozen segments. Upon each of these segments a number in large type is placed, and they are arranged in a spiral direction around a cylindrical slip of wood at distances of one inch apart, behind one another, so that when looking upon the end of the slip of wood each segment is distinctly seen, the whole forming together the original circle, but the piece numbered one being nearest to the spectator, and that numbered twelve being eleven inches further off. This is mounted on any convenient standard, and is called a *focimeter*. To use it proceed as follows:—Place it before the camera at the distance which is likely to be adopted by a sitter when taking a portrait; focus *very carefully* upon one of the middle numbers, say number *five*, directing attention especially to the finest lines on that segment of the instrument bearing the number indicated. Now, upon a prepared plate take a picture of the *focimeter*, on examining which it will be at once seen whether the chemical and visual foci agree, as in that case the finest lines on segment *five* should be distinctly visible in the negative, and all the others less so. If the lens be under-corrected for actinism, the finest lines on a segment bearing a lower number will be most distinct on the negative, probably three or four, which indicates the amount of variation, it being greatest when the number of the distinct segment is lowest. If over-corrected the number of the distinct segment will be higher than that originally focussed upon the screen. Consequently, if on focussing number five you get number three most perfect on your negative, in order to obtain number five you must focus for number seven, and so on. A substitute for this instrument may be made by using some finely-printed matter upon cards, and arranging them one behind another at regular intervals, like a set of steps. With either of these arrangements a single experiment is sufficient to show not only the fact, but the quantity of variation between the two foci, if existing.

TANNIN PROCESS.—We understand from Major Russell that he has made some further improvement in his new preservative collodion process, as described in the sixth edition of Mr. Hardwich's *Manual*, and that he is about to describe fully the details in a little pamphlet shortly to be published.

L'AMENDE HONORABLE.—It is always distressing to a right-minded person to find that, from carelessness or want of consideration, he has inadvertently hurt the feelings of another, and such an one will surely take the first opportunity of making any reparation that lies in his power. In our last we made some allusion to a circumstance of the kind above indicated—an allusion that was written and in type before we received a letter connected with the same subject, which, however, we contrived to include in our last issue, wherein the writer expresses his regret for any offence given, disclaims any malicious intention, and, in a manly and straightforward manner highly to be commended, urges upon the reader a reperusal of his original paper wherein the offence had arisen, and makes use of the following words, which we quote:—"If he find I have not treated my opponents with proper courtesy, *he will please to erase the offending paragraph or sentence*, AS I WOULD WISH TO DO. It is my desire, in this as in all else, to do as I would be done by." Surely with such a concession any opponent must be satisfied, and we do not imagine that the gentleman to whom it is specially made will fail to respond by accepting the olive branch thus tendered. We trust that all animosity is now buried in oblivion.

ON PHOTOGRAPHIC PRINTING.

By MAXWELL LYTE.

[Abstract of Paper read before the Photographic Society of Scotland, March 12, 1861.

THE subject of photographic printing was one of the most important to which the attention of the photographer could be turned and too much could not be said about it. In the following remarks he would merely sketch his own experience in printing on albumenised paper.

It would, he thought, be scarcely necessary for him to describe the mode of albumenising paper, for not only could it be purchased much cheaper and better than it could be made by the amateur but the method of preparing it was also to be found in every manual on the subject of photography. He thought that in albumenising paper it was a mistake to add acetic acid as recommended by some, for acetate of silver was then formed in the paper, which was objectionable. Before being albumenised, the paper should be as dry as possible, and it should not be allowed to remain on the albumen more than two minutes, as a longer time than that allowed the albumen to sink into the paper, and so prevented gloss. Although advisable to keep the paper for some time before albumenising, after that operation had been performed it could not be used too soon. He had never seen any albumenised paper which, with every precaution, did not deteriorate after being kept for six months.

To sensitise the paper, a solution of nitrate of silver, of the strength of eighty or ninety grains to each ounce of water, should be used. After remaining in this bath for not less than four minutes, the superfluous solution should be removed by drawing a glass rod over the surface of the paper, and should be returned to the bath. Paper thus excited might be hung up to dry by aid of the clips now sold for that purpose.

The nitrate of silver solution would be apt to get discoloured. To remedy that various methods had been recommended, such as coagulation of the albumen by means of heat, filtration through animal charcoal or kaolin, and the addition of citric acid. Those methods were more or less faulty, and what he recommended was the following: mix together—

Crystallised phosphate of soda... 3 ounces 5 drachms.
Carbonate of soda ..... 1 ounce 3 „

Take of that mixture (which must be kept in a bottle) two ounces and dissolve in water thirty-five ounces.

The above solution, added to the bath in the proportion of one drachm to each pint, would effectually decolorise it.

The paper being excited would, by being put into one of Marion's preservative cases, keep for some time. Care must be taken that it was not exposed to fumes of ammonia, sulphuretted hydrogen or such deleterious gases, else its quality would be much impaired. The operation of printing must be regulated by the taste of the operator. It must be borne in mind, however, that the strength of the print was always deteriorated by the fixing process; hence it was necessary to carry the printing much deeper than would be desired when finished.

If, as sometimes happened, the sky of the negative was solarised it would be necessary to stop it by means of paper coated with bichromate of potash, unless where trees or such objects intervened. That would be found a suitable plan for preserving the whiteness of the skies. He thought, however, that pure white skies were bad. Various expedients were adopted for skies. Clouds might be printed in separately, either from a negative taken from nature, or they could be produced in printing by the judicious arrangement of pieces of cotton wool. A finely-graduated sky could also be produced by keeping a piece of cardboard moving over the sky when printing.

The picture being printed, the next operation was that of toning which was accomplished in a solution prepared thus:—Dissolve 200 grains of phosphate of soda in a pint of water, to which must be added one ounce of a solution of chloride of gold, made as follows:—

Terchloride of gold ..... ½ ounce.
Water..... 12 ounces.

Almost as soon as the picture, previously washed, was immersed in this solution, a change in its colour would take place. Taste and judgment must regulate the tone, which, when attained, the picture must be removed from the toning bath to a plain water bath. While in the toning solution it must be frequently turned, and kept in constant motion. The toning should, by preference, be done in a warm room. The solution of chloride of gold and phosphate of soda must be kept in bottles separately, but when mixed should be used as soon as possible. As the deposit of gold took place only on the dark parts, it was advisable to cut off all the darkened edges of the paper before toning. It should be soaked in water for nearly an hour, and, during this operation, should be kept in constant motion, to prevent stains. Highly-albumenised paper was slower to tone than the plainer kinds, but the proofs had a superior appearance when finished.

The fixing was done in a strong solution of hyposulphite of soda, after which the proof must be thoroughly washed. Many used contrivances such as sponges for washing; but he knew of no better plan than by simple washing in repeated changes of water for twelve hours.

For mounting, he advised paste made of potato flour. When the paste was quite dry, the print was passed through a press. By making use of an encaustic paste, the appearance of the finished proof was improved. This was made by dissolving two ounces of white wax in two ounces of turpentine, to which should be added about a drachm of mastic varnish.

THE TANNIN PROCESS.

We make (by permission) an abstract of the manipulation of Major Russell's process from the sixth edition of Hardwich's *Manual of Photographic Chemistry*, as follows:—

A newly iodised collodion will succeed in this process since the tannin has an extraordinary effect in increasing the intensity; but the picture will be more brilliant upon an old collodion, though requiring longer exposure. A collodion of a character midway between the horny and powdery kinds is to be chosen in preference, and bromo-iodised with the following, namely:—

Bromide of Ammonium..... 40 grains.
Iodide „ ..... 90 „
Iodide of Cadmium..... 90 „
Alcohol, S. G. ·816..... 10 ounces.

Pulverise; dissolve without heat, and filter.

Of the preceding, add one part by measure to three parts of plain collodion; clean the glasses carefully with a little waste collodion, and be sure that they are quite dry at the time of coating with collodion.

If large plates are to be prepared, or if the collodion in the final operations shows a tendency to leave the glasses, they should be prepared with a preliminary coating of—

Nelson's patent gelatine ..... 20 grains.
Distilled water ..... 10 fluid ounces.

Dissolve, filter, and add half-an-ounce of alcohol—in order to preserve good for some considerable time. Pour a quantity of the above on to a plate, in a sort of pool, and guide it all over the plate by the aid of a glass rod, taking care to keep the back of the plate clean: pour off the excess into a bottle, and stand the plates on end, resting on an angle, upon blotting-paper, to drain and dry spontaneously, carefully avoiding dust.

Coat the above when *thoroughly dry* with collodion in the ordinary way, and when fully set immerse in the ordinary thirty-grain nitrate of silver bath, known to be in good working order for the wet process. When fit for removal take out the plate and wash it freely under a tap for about one minute, or until all greasiness has disappeared from the film. In warm weather pour over the plate a solution of common salt (five grains to the ounce of water), wash again under the tap, and finally with a small quantity of distilled water.

The preservative solution is made by dissolving fifteen grains of tannin (procurable at any druggist's) in one ounce of distilled water and filtering through blotting paper.

Measure out two separate portions of the above, each sufficient to cover the plate easily (about two fluid drachms for a stereoscopic sized plate), apply the first portion several times on and off to remove the adherent water, then cover with the second portion and stand on end on blotting-paper in a perfectly dark place to drain and dry, finishing by artificial heat, but carefully protected from light.

Develope as soon after exposure as possible, with—

Solution No. 1 ..... { Pyrogallic acid .... 72 grains. Alcohol..... 1 ounce.
Solution No. 2 ..... { Nitrate of silver ..... 20 grains. Citric acid..... 20 grains. Distilled water..... 1 ounce.

To three ounces of distilled water add thirty minims of solution No. 1. Moisten the plate rapidly with filtered water; and to a sufficient quantity of solution No. 1, diluted as above, add *five minims* of solution No. 2 for every fluid drachm. Apply the mixed developer, and keep it moving on the plate until the image is sufficiently intense, after which wash, fix with hyposulphite of soda in the usual way: thoroughly wash and dry the plates and varnish.

INTENSIFYING PROCESSES CONSIDERED AS ADJUNCTS TO INSTANTANEOUS PHOTOGRAPHY.

By Valentine Blanchard.

[Read at a meeting of the South London Photographic Society, March 21, 1861.]

All who have beheld the glorious productions of Wilson, of Aberdeen, and the instantaneous sea and sky photographs of Le Grey, must be impressed by the conviction that the future of artistic photography lies not in giving forth to the expectant world delicate primrose or white skies, with the hills so sharp in outline that the thought of the consequences attendant upon a fall upon them makes us quite uncomfortable; and a middle distance, generally pronounced by the uninitiated to be ice covered with snow, and which only the connoisseur knows to be the photographer's hieroglyph for water; and the foreground made up of black masses dotted with white, known only by general outline to be trees. Photographs of this well-known class will soon be covered with the dust of oblivion. Much has been said in defence of photography. During its early struggles its artistic shortcomings were explained away, and the *dilletante* exclaimed—in order to judge fairly this wonderful art, that has assumed the proportions of Hercules whilst still in swaddling clothes—"We must start afresh!" All the time-honoured rules, the study of which only has given us our present knowledge on art matters, are useless, for this new art sets them all at defiance.

By degrees the taste in photographic matters became insensibly depraved, and for several years the productions most commended were those where the *manipulative* skill was most apparent. The lens that produced a result upon the sitter as powerful as that effected by the ghost of Hamlet's father, and made

> "Each particular hair stand on end
> Like quills upon the fretful porcupine,"

was the one "applauded to the echo." A mania for black tones followed, and was succeeded by one for landscapes of gigantic proportions. All these efforts of the unsatisfied speculative mind have not been in vain; but they have been too much in a wrong direction. The French, with a truer taste than ourselves, were dissatisfied with the larger landscape productions; and, instead of devoting themselves to this branch of photography, pointed their lenses towards the façades of their magnificent cathedrals. They have, in consequence, produced *pictures* the like of which had never been seen since the world began. The skies in these pictures only make more clear and distinct

> "The high embowered roof
> With antick pillars massy proof
> And storied windows richly dight."

Many of them are, indeed, so perfect in every sense, that they have (to borrow again from the immortal Milton) "dissolved us into ecstacies."

Le Grey is the man who has spanned the gulf that separated photography from the fine arts. We regard him as the pioneer of the new era in photography, and Wilson and a few others have formed the advanced guard. When we look at Wilson's later productions, and see that water—usually so imperfect and naked in photographs—can be produced with all its undulations, its thousand lights and shadows faithfully pourtrayed; when we see it proven that the sun, generally regarded as so fierce in some of his moods, has calmly looked on while the daring photographer has "taken a sight" at him, and even has smiled upon his efforts, and left the impress of his beaming face upon the sensitive plate; when cloudy sky and stormy sea can be portrayed with equal facility, we cannot help feeling that the future before us in photography lies in the perfecting of every means and appliance that can tend to make instantaneous pictures, of every size, easy of production.

As one of the most difficult operations in instantaneous photography is the bringing up of the image to a sufficient degree of

intensity, we propose to devote our attention this evening to those of the many intensifying processes which we have practically tested. In doing so, we feel no apology necessary. Our chief aim is to cause discussion upon this important part of all instantaneous processes. We shall simply record our own experiments, and doubt not but that in the discussion much valuable information from our practical members will be elicited as to the best means of getting over the difficulties which beset most of the intensifying processes.

At the outset, we would say that, if it be possible to bring the picture up at once into anything like a printable condition, we would most certainly not adopt any of the after methods we purpose mentioning. The best means of producing negatives with the requisite intensity is to employ a bath quite neutral, a collodion made with at least as much alcohol as ether; in many cases we would use two parts of alcohol (sp. gr. ·800) to one of ether (·750), iodised with iodide of cadmium four and a-half grains, bromide of cadmium one and a-half grain, to each ounce of plain collodion.

We consider the preparation of the cotton for this collodion a most important matter, as so much of the after success depends upon the temperature at which it is made. That which we have employed was made with weak acids, at a temperature just below the dissolving point. We have not time now to go into the formula, as we have other things to consider. We hope to do so, however, on some other occasion.

The developer we employ is as follows:—

Iron	30	grains.
Acetic acid	15	,,
Acetate of soda	1½	,,
Water	1	ounce.

With the collodion we have described and this developer, we secure an image which comes up slowly, gradually acquiring during the operation what appears to the eye a fine black image; but which, when fixed and brought out to the light, shows that fine peach-like bloom which is so great a charm in negatives produced by the pyrogallic acid. The application of pyro., and a few drops of nitrate of silver, completes the operation.

Could we always succeed with this process in securing as much density as is desirable our task would soon be over; but, unfortunately, there are many subjects where this totally fails—therefore the need of one of the many after-processes of intensifying which we will now proceed to describe. We beg, however, to say, before we go further, that we are not going to announce anything new or startling. We shall simply record our experiments, and send round results produced as nearly as possible at the same time, and under the same circumstances, so that the processes may be fairly tested side by side.

The first one is produced by the agency of a saturated solution of bichloride of mercury, and, after washing the plate, a few drops of a saturated solution of hypo. in half-an-ounce of water is poured over, and the plate well washed. This plan answers well for many subjects; but the tendency is to produce harshness, unless the picture has received a slight excess of exposure. The same objection applies to the application of a weak solution of ammonia after the treatment with the chloride of mercury. The great objection to this, or any plan where mercury is employed, is the tendency the film has to split off in drying. This can only be remedied by rejecting any collodion that is at all contractile, and employing one containing not less than five and a-half grains of really soluble pyroxyline to the ounce. Another evil, scarcely less than the one just named, is the production of crapy lines in the negative when dry. The remedy for this is a collodion of equal parts of alcohol and ether, and to use solvents as free from water as possible. Crapy marks in a negative indicate invariably the presence of water in the collodion.

The next plan we will mention is one that, a few years ago, was quite a favourite with us. After the application of pyro. and silver, should anything further be required, we poured over a very weak solution of bichloride of mercury, draining it off and pouring it on two or three times, until the surface appeared covered by an even coating of black. We did not allow the image to whiten, but washed immediately. On holding the negative up to the light, much that was very weak, especially in the half-tones and lighter shadows, were brought up; while the powdery nature of the film permitted the light to act much more powerfully than would be imagined, judging from the appearance of the negative. This application of a weak solution of bichloride of mercury for so short a time does not make the film tender, and one of the greatest difficulties is thus overcome.

The next we will mention is the application of iodide of mercury. If a weak solution of bichloride of mercury be poured over the image, and, after washing, a solution of iodide of potassium is spread over in like manner, a yellow image is formed, caused by the precipitation of iodide of mercury upon the silver image. If these solutions are poured over alternately twice or thrice, perfect chemical opacity will be produced in the high lights of the negative; and, by comparing the back of the picture with the front, it will be seen, from its conversion into a bright yellow, that the image is composed of iodide of silver as well as mercury. This kind of picture is not at all desirable in an instantaneous process; we would, therefore, recommend a different plan. If we add iodide of potassium by degrees to a solution of bichloride of mercury, a dense scarlet precipitate is thrown down. The clear liquid left after subsiding will produce the yellow image, but still frequently with too much density. There is also a danger of producing marks and stains in pouring on, which no after treatment will remove. But if we continue to add iodide of potassium we shall find this dense red precipitate gradually taken up, until it is all dissolved in the excess of iodide of potassium. If we now apply this solution to a negative we shall find its fierce propensities very much curbed. The first effect is to produce blackening, and it goes on gradually until a very harmonious negative is produced. This method has many advantages over the other applications of mercury. If you obtain a well-developed positive, with all the detail plainly visible after very careful washing, it can be put in the plate box and left until you reach home; for it acts as well upon the dry as upon the wet surface. Of course it is necessary to wet the film with water before the application of the solution.

The last method we shall mention is one that, in our hands, has given the best results, affording at the same time the greatest facility of modification. It is the application of an aqueous solution of iodine. We have never seen this plan given in any of the journals, and we felt assured it is known but to few. Tincture of iodine has long been recommended, and when only a slight increase of density is desired it answers very well, followed by pyro. and silver. The advantage of the new method is, that you can secure as much or as little intensity as you may require by employing a strong or weak solution. In using alcoholic tincture of iodine great difficulty is experienced in making the alcoholic solution unite with the aqueous one, and frequently stains are produced during the operation. By the following plan the difficulty is obviated:—

The method of producing a solution of iodine in water is, doubtless, known to many; but, for the benefit of those not familiar with the plan, we will describe it. If a drachm of iodine be put into a 4-oz. bottle, no solution will take place; but if iodide of potassium be dropped in, a change takes place immediately: first, a yellow colour is produced; on adding more, a beautiful crimson appears, until, on frequent additions, the whole of the iodine is dissolved, and a deep coloured solution remains. This stock solution can be diluted according to the intensity required. We always judge by the colour the strength necessary to produce any effect we want. If a negative require but a little vigour, then we apply a solution in colour between sherry and port; and let it remain on a few seconds. On holding the negative up to the light, a very decided change will have been produced. More intensity will have been imparted to all parts of the negative, without having changed in any material degree the general appearance of the image on the surface. If, however, the picture be thin, then a strong solution may be applied, and poured on and off until the image comes out as a beautiful positive full of delicate half tones, and of a very pale primrose colour. A little pyro. and silver will complete the operation.

One great peculiarity we have noticed in negatives so produced is, that on holding up the primrose image to the light, a ruby colour, inclining to the complementary purple, is seen. But on looking at the surface, nothing but the bright primrose colour is visible.

There are many other processes possibly yielding good results in the hands of those who have given attention to their peculiar requirements. Among others, there is the chloride of palladium; but as it is more expensive, and does not yield results better than some we have mentioned, we have not introduced it. Indeed, the opinion of those competent to judge is, that it is not equal to several we have described.

Our task is now done. Believing that the *modus operandi* of the veriest tyro may convey some hint to the thoughtful experimentalist, and may be instructive to many—if only to serve as a warning beacon, pointing out some photographic shoal or quicksand to the wary voyager, or confirming the established chart—we shall sit down content to learn in the discussion how little or how much is considered useful to the many. And if, however imperfectly our task may have been performed, you will take the will for the deed, we shall be more than repaid.

PRACTICAL OPTICS OF PHOTOGRAPHY

By J. Rothwell.

No. III.

I wish now to bring before the reader's attention a matter of the first importance, bearing upon his daily operations, the value of his productions, and the unnecessary trouble to which he is often subject, in consequence of a want of practical knowledge of the focussing qualities of the lenses he has in constant use, in connexion with which a number of experiments will be requisite.

In the generality of advertisements issued by opticians it is stated that the optical and actinic foci are coincident and where uniformity of workmanship and quality of glass are obtained such may be the case nearly. But every photographer will find it worth his while to ascertain experimentally for himself how near it is so with his own particular lenses. To do which proceed as follows:—Focus the centre of the image, or the whole of it, on the ground glass with the nicest possible exactness, which will be at the optical focus; then take a picture with the plate in the very same position; then a second with the plate one-eighth of an inch *nearer the lens;* then a third at a quarter of an inch nearer; and so on, as many as you think fit. By comparing them, if any one is sharper than the first it is evident that the point at which that was taken is the actinic focus, which gives a superior picture to the optical focus, and when such is the case the lens is said to be under-corrected. But, if the first picture should be the best—that is, the sharpest—then take several in a similar manner, at distances farther from the lens than the optical focus, and if any of these are superior to the first the lens is then said to be over-corrected. By proceeding in this way you will be qualified to judge of the best position in all cases (with the particular lens or combination tried) for obtaining the sharpest picture with the shortest exposure. But if, after all, the first picture is the best, you may surely conclude that the optical and actinic foci are coincident. When you have tried these experiments you may work on, knowing that you are producing the sharpest pictures obtainable by that particular lens or combination. I am supposing the above experiment to be tried with a focal length of seven or eight inches, and moderate-sized stop—say three-fourths or one inch: for larger or smaller lenses all dimensions should be in proportion.

To show the importance of every photographic practitioner acquiring a thorough knowledge of the focussing qualities of his lenses, it must be borne in mind that it makes an immense difference between taking a picture at the optical and actinic foci when they are not coincident; for, at the optical focus the luminous rays which converge thereto are weak in power, whereas the actinic rays, although they do not come to a good focus at the same point, act powerfully in confusing and spoiling the definition. On the contrary, if the picture be taken at the actinic focus, the luminous rays have but a weak effect in blurring the definition.

A double combination will, as a rule, always give a sharper focus than a single one, supposing their focal lengths are equal, and the same size of diaphragm used; because the back lens to a certain extent corrects the aberration of the front one, thus causing the optical and actinic foci to be finer, and also making them approximate or become more nearly coincident.

The next point relating to the focus to which I will refer is that where the images of objects situated at various distances in front of the lens are formed at relative different distances behind it. Referring to *Fig.* 1, page 85: suppose an object to be at C, and the rays from it brought to a focus at *d;* then another object farther off imaged at *b:* if the plate *h k* is placed at *b*, the image at that point will be distinct, while the other image, which would be distinct at *d*, is indistinct on the plate, in consequence of the converging rays striking the plate before they come to a focus. Again: if the plate were at *d*, similar effects would occur, but the conditions of the two images would be reversed. Therefore, to obtain both images in *equal* focus, it is evident that the plate must be midway between them (as in *Fig.* 1,) at *a*. The assertion has often been hazarded that it is impossible to obtain the images of near and distant objects in good focus on the same plate simultaneously by any other means than using a small stop. I am not of that opinion, but believe it quite within the range of possibility.

Having now touched on the most important phases in relation to the focus, I will briefly state my views on

DEFINITION.

I have never yet seen the photographic picture having that fine and perfect definition I wish to see attained, nor the lens which would produce it—in fact, I consider all photographic lenses yet produced faulty, inefficient, bungling affairs, in comparison to what is required, and what I hope and believe will yet be elaborated.

The general principles on which photographic lenses are constructed may be regarded as the same, or at least similar, to those governing the construction of the object glasses of telescopes—that is, the object aimed at is to correct the spherical and chromatic aberrations of the *central pencil*, or that which comes to a focus in the axis, leaving the oblique pencils in a condition far from what is desirable; but, if ever we are to have that *desideratum*—the perfect instrument which photography requires—it must be arrived at by searching out a method of combination and correction altogether different to anything at present in practice, and which there is, in my opinion, some faint probability of being worked out.

The general effect to be produced with respect to definition is that all pencils, whether central or oblique, be brought geometrically correct to the finest points on every part of the flat plate; and the thinner or more attenuated they are the better, provided always that sufficient intensity of light be retained. Hitherto all contrivances have failed to do this satisfactorily, the difficulties to be surmounted are so great and numerous. Imperfect definition spoils more pictures which are permitted to remain in existence than any other single evil with which we have to contend. I am persuaded that any one who has studied the subject will admit that it is imperfect definition principally which makes such a mess of a picture that happens to be a little over-exposed. To illustrate this forcibly, let us consider the "human face divine" in the case of a portrait. If a portait is much over-exposed, in what state have we the *features?* Where are they? Gone into a white, blank *unlikeness*—having a hideous similarity to the original, it is true, but no "likeness." "How deathlike it looks!" is the common remark—the very word for expressive significance. Both life and soul are gone out of it; and yet many photographers, after years of practice, regard it not, or do not understand. Let me impress on every fellow-workman in the art that herein lies (more than in anything else) the vast difference between the lifelike portraits of a master in the art and the caricature of a bungler. Now, what is the cause of this? Why is all the shadow and detail obliterated through over-exposure? It is principally bad or imperfect definition, to explain which I will again refer to *Fig.* 1, page 85.

The rays which radiate from the point of reflection C are supposed to be brought *accurately* to the focus *a*, when a very good lens is used; but the best lens ever yet constructed will not do anything of the kind. There are always some erratic rays, which strike the plate in a confused state about the focal point—which we will suppose to amount to one-sixth of the whole, the other five-sixths coming accurately to the focus. Of the rays from another point very close to C, the first are acted upon in like manner, and so on from all parts of the arrow. Then, if a picture be taken of short exposure, the definition will be very good, because the light *at* the focus will have been sufficiently powerful to make an impression; whereas the erratic portion being only one-fifth of that at the focus, and also being in a diffused state, will not have operated sufficiently to be perceptible—which principle of action I explained in the latter part of my paper No. II. Again: if a second picture, but over-exposed, be taken, the erratic portion will have acted to such a degree as to obliterate to a considerable extent the detail and shadows; thus producing a blurred picture, because the erratic light from one point overlaps that adjoining, thereby acting and reacting in a manner highly detrimental to the excellency of the general result. In accounting for this evil perhaps something may be allowed for light which, after having passed through the film, is reflected from the back surface of the glass plate; but such action must be very small indeed. Diffused light in the camera, it has been thought, has some action here also; but I attach no importance to it, for if, in the case of an over-exposed picture, it had any influence in destroying detail, it must have a proportionate action on an under-exposed one—which, however, is not perceptible.

I imagine I have now said enough on this part of the subject of definition to convince all photographers who are ambitious (and who is not?) of producing lifelike portraits, having a good stereoscopic appearance, full of detail and shadow, to make it their rule never to over-expose, and in all cases to use the smallest stop practicable, as well as such chemicals as will give the fullest and most perfect detail.

There is a property of light—its natural divergency or tendency to radiate—which I have never yet seen mentioned in any publication, or even spoken of (and which I believe has not been taken into account by opticians in constructing lenses), in relation to its effects on definition and focus, particularly with lenses of long

focus, and in enlarging pictures by copying, on which I shall have something to say worth attention in my next, being, I believe, the first person to draw public notice to this property in connexion with the optics of photography.

ON MANIPULATING WET COLLODION PLATES IN THE FIELD.

By VERNON HEATH.

[Read at a Meeting of the Blackheath Photographic Society, March 18, 1861.]

LET me in the first place explain the reason why I am induced to bring this Paper before you. I have frequently noticed that, at meetings of various photographic societies, papers have been read upon this subject; but I have always remarked that the operator merely described the manipulation of stereoscopic plates, or, at all events, of plates of small size: in several instances indeed I have noticed that the size of the plate was not even mentioned. In fact, I have no hesitation in saying that, in nearly every case where papers have been read before societies upon manipulating in the field, either with the old or any of the new processes, the operators' experience was limited to small plates.

I recollect once reading a paper which had been produced before a provincial meeting, in which the author commenced by condemning every dark tent or box in use, and then explained a contrivance of his own, which he carried in his coat pocket; but he nowhere described the size of the picture he worked, and it was only by observing that in one sentence he spoke of the stereoscopic effect of his pictures, and the angle at which they were taken, that I was able to determine the size of the negative he obtained. Now, I believe that the condemnation of tents and dark boxes by those whose operations are limited to small-size plates are as gratuitous as unnecessary, for it requires but the exercise of a very little ingenuity to work small plates without any such contrivance at all.

I once knew a zealous follower of the art who worked the wet collodion process thus:—He fitted his camera in his hat, punched out a piece of the front of the hat the size of the lens, which piece he refitted and attached a string to it, and when working used it as the cap of his lens. In one breast pocket of his coat he had his bath, and in another a developing bath, fitted with yellow glass; and with such means he succeeded in obtaining pictures.

But the dark tent and chamber are, however, necessary for those who work plates of ordinary landscape size. And I believe that the wet process is still superior to any of the dry processes, where really artistic and truly satisfactory results are desired, I will now state my own experience and mode of manipulating with that process, venturing to believe that it might be in some measure acceptable to the Society if I described the exact means which enabled me to procure the negatives from which my pictures now in the Exhibitions are printed, and one of which this Society has done me the honour to select as its presentation picture—the London Photographic Society having selected three for a similar purpose. I shall refer chiefly to my photographic visit to Endsleigh, the seat of his Grace the Duke of Bedford, in Devonshire.

Probably the points of peculiarity in my manipulation, and those most worthy of your attention, are—First, my method of working Smartt's tent; second, what would generally be considered the *over-exposure* of my negatives; third, my method of developing; and fourth, the deferring of fixing till the end of the day, or to some other convenient time.

First, then, as to the apparatus.—My negatives are all on 12 by 10 plates, and, with the exception of one (which was previously mentioned in this room, and which was taken with a Ross's 8½ by 6½ orthographic lens), were all taken with a Grubb's C lens—a lens which is intended to cover merely 10 by 8, and I think it will be allowed that the definition even to the margin is all that can be desired. At this point I may be permitted to observe that I believe the landscape lens *par excellence* is that known as the single lens; and that, for this purpose, it is superior to all the new lenses, whether orthoscopic, orthographic, or triplet. I do not mean, in speaking of Mr. Grubb's lens, to disparage the landscape lenses of Mr. Ross, Mr. Dallmeyer, or any other maker of eminence; I am merely mentioning the fact that my pictures were taken with a Grubb's lens, and that I think as highly of it as possible for landscape work. My camera is a folding one, and, although somewhat heavier, I consider it superior to that known as Captain Fowke's and to Mr. Kinnear's, inasmuch as it is firmer and more rigid. The tent which is before you is that known as Smartt's, and I must say that, for field work, I know nothing so efficient and convenient. I have arranged in it some special fittings and contrivances of my own, to which I will refer presently. I used Ponting's collodion only, and a bath made after his formula.

Now for the manipulation.—In the first place I am most scrupulously careful and particular in every portion of the process, and I think it impossible to photograph properly without being so. In cleaning my glasses I use nothing but alcohol and tripoli, applied with a tuft of wool, and then thoroughly removed with a linen cloth. I then pour on a few drops of alcohol, which I rub off with a clean linen cloth, and finally polish with a leather. To one side I give a little more attention than to the other, and I stow the clean plates away in pairs, placing the two well-polished sides together.

Then as to the manipulation in the tent.—The general arrangements of Smartt's tent are now so well known that it is only necessary that I should point out the contrivances I have had fitted to it. For instance, a water bottle is hung over the table, which I can work with one hand, and the negative bath is suspended from the front of the table, as you see. Over one part of the table, and attached to the rods of the frame, I have contrived a shelf, where the *chassée* of the camera is placed: this, it will be seen, is a very useful contrivance. I coat my plate in the tent, after having first carefully closed the opening. When the plate has been in the bath the requisite time, I allow it to drain for a few seconds, and then remove it to another little ledge I have contrived, and allow the draining to complete: it is now ready for the *chassée*. I mention this with some minuteness, because I am quite sure that one of the most prolific sources of stains upon negatives is due to the plate not being sufficiently drained before it is placed in the *chassée*. I not only drain it thoroughly, but I put strips of blotting paper along the top and bottom of the plate. The plate is now supposed to be in a proper state to go into the *chassée* of the camera.

With regard to the exposure in the camera, I believe that the most artistic effects are produced by what is termed *over-exposure*,—a term which ought no longer to be allowed, if its results are superior to those from negatives exposed a less time. Excepting, of course, in the case of burnt-up pictures, I do not think there is any such thing as *over-exposure* in landscape photography.

It must not be supposed, however, that I mean by over-exposure exposing for a great length of time. The average exposure of my negatives, in varying but good light, was about thirty seconds, using a lens, it should be remembered, of fifteen-inches focal length. What is usually understood by the term *over-exposure* the several negatives I now produce will illustrate. It will be perceived that there is a want of that complete brilliancy which negatives believed to have been exposed a proper time generally exhibit. If they are viewed by transmitted light a slight redness will be perceived, and this is usually supposed to be a sign of *over-exposure*.

The effect which I believe is produced by what is erroneously called over-exposure, or at all events by negatives in the condition of these, is a greater gradation of tone and softness of effect, and the different planes of the subject are brought out in a much more beautiful manner. I think that when a negative appears very brilliant there is generally a flatness of effect. I lay some stress upon this point, as I really believe it to be important, and I think that if more attention were paid to it, better and more artistic effects would be produced.

Now I believe that my method of development is peculiar—at all events I think that that distinctiveness of character which is stated to belong to my pictures is, in a great degree, due to the nature of the development. I prepare sufficient developer for a day's work, of the following proportions:—Eight grains pyrogallic acid, eight ounces of water, one drachm of glacial acetic acid, and one drachm of alcohol. This is about the strength that a pyrogallic developer is generally used; but though I thus prepare it, I do not use it of this strength. I have a bottle of distilled water in my tent, and into one of my developing cups I pour just sufficient to cover the plate—say two ounces.

Being now ready to develope, I carefully close the tent, and, having previously placed the *chassée* on its ledge, I remove the plate with the pneumatic developing holder, and pour over it very carefully the measure of distilled water. I allow this to flow over and remain on the plate for a few seconds, and I thus take up a large portion of the free nitrate of silver. I then pour the water back into the developing cup, and add to it about a drachm of the pyrogallic solution, so that instead of commencing my development with a one-grain solution of pyrogallic, I have merely taken a drachm of a one-grain solution to two ounces of water. This is a very weak developer, and of course the action of development is much retarded—the picture coming out very faintly and gradually.

t is, therefore, very manageable and pleasant, and in hot weather vill be found most advantageous; and, what is of great importance, obtain the details in the shadows to an extent I never succeed in getting with an active developer.

When I am satisfied with the amount and effect of details produced (the negative at this stage being faint, and of an intensely ed colour), I slightly wash the plate and complete the development with the one-grain solution of pyrogallic, to which, if it becomes necessary, I add a few drops of silver; but, if possible, it is better to do without the latter. I then wash sufficiently to remove the developer, and at once place the negative away in a box I have had made for the purpose, in which the grooves are of such a form that they cannot injure the edges. I put a pad of wet blotting-paper at the top and another at the bottom of the box, and the negatives are thus kept sufficiently damp until the end of the day, or even until the next day, so that I am enabled, without risk, to fix them. I do not fix in the field unless circumstances compel me; and to those who use the wet process this is an immense advantage, as it saves time that is valuable, while the necessity of having a large supply of water is avoided.

I may mention that if, by any chance, the edges of the film are injured previous to fixing, so that there would be a risk of losing the film during the fixing and washing, I first of all dry the negative thoroughly, and then with a camel-hair brush and the ordinary spirit varnish I paint round the edges and damaged places, and when dry and hard I float water upon the negative until the film is saturated. I then fix and wash in the ordinary manner. By adopting these means I have never lost a negative; but I very seldom have one damaged so as to render this treatment necessary.

To complete my remarks upon the use of the tent, I ought to explain that there are cords furnished with it, which, whether there is wind or not, I always make a practice of securing the tent with previous to using it. No doubt a high wind would blow it over but for these cords: it is, however, secure enough with them; and, as the cords are sold with, and are therefore a portion of, the tent, I should just as soon think of putting up the tent without the cover as without them.

The actual chemicals and other things required for use in the tent are contained in a field-box of a very convenient and portable form; and, as I always place it in exactly the same position underneath the table of the tent, I am able to find whatever I want without any difficulty. In my field-box I carry a spirit lamp, which I find very useful for drying plates from condensed vapour which forms upon them during such a season as that of last year.

I have now said all that I at present desire to state upon this subject; and I shall feel obliged if you, sir, or any member of the Society, will make any observations you think fit upon the remarks I have made. I may say that I have a passion for the art, and that whatever falls in my way calculated to forward it I feel the greatest pleasure and gratification in communicating.

In conclusion, let me say that, if everybody would try to find out how little they could do with in the field, there would not be the objections against the wet process we hear of at present. I think that those who prepare plates for any of the preservative processes really in the end take a great deal more trouble than is required for the wet process: there is the ordinary preparation of the plates in the first instance, the washings afterwards, then the application of the preservative, and at last the chance that the plates might not turn out good, for a very large per centage certainly do not.

[During the course of his remarks, Mr. Heath produced a great number of illustrative negatives and prints. He also put up his dark tent, and exhibited the various ingenious contrivances he referred to.]

[The following short memoranda accompanied some specimens of plates, showing the abnormal effects of light known as "reversed action," and were read at the meeting of the North London Photographic Association, 27th March, 1861.]

REMARKS ON TWO NEGATIVES—WET PROCESS.

By R. L. Maddox, M.D.

The small plate accompanying this was taken in bright light, out of doors, with Voigtlander's lens; the collodion sample was bromo-iodised, I believe, with iodide of potassium, holding bromide of silver to saturation; exposure, counting the pulse, five seconds; developed with ordinary pyrogallic and acetic acid solution, and cleared with hyposulphite of soda.—*July or August*, 1859.

The stereo. plate taken out of doors, in the shade, *i.e.* not in strong light; rain falling fast; Derogy's twin lens; exposure "twelve" seconds; collodion sample bromo-iodised by iodide of sodium and bromide of calcium; developed partially with ordinary pyrogallic and acetic acid solution, several weeks old; sufficient of the same not being at hand to continue the action to the quantity poured off the plate an addition was made of a developing solution containing pyrogallic acid nine grains, citric acid four grains, and six ounces of water; then together returned to the plate. The image to the left, when viewed with the face *from* the beholder, appeared to develope distinctly and with great definition; the image to the right slowly. Almost suddenly the image to the left altered in character, seeming to disappear under the developing solution, while the one to the right increased steadily in depth of tone until the action was stopped. The weather had darkened so quickly that it was impossible to judge of the actual state of the image by yellow light; it was therefore washed and cleared with hyposulphite of soda solution.—*October*, 1860.

The development was not delayed nor the plate at all dry. The first portion of the developing solution was quite sufficient to fully cover the plate, but not superabundant. It was kept in gentle motion. A few drops of a twenty-grain solution of nitrate of silver had been added.

Great pains had been taken to have the visual appearance of the two images perfectly alike—the lenses remaining unaltered, and only the sliding portion of the camera used to focus for a picture at a subsequent trial, some days later. Every part of each picture was equally and beautifully sharp.

Was the impending storm likely in any way to set up an opposite electrical state at either end of the plate? The developing stand was set in a pan containing water and waste solutions.

Is there any appreciable effect on a plate when being developed in the proximity to electrical discharges?

The small plate is sent only as a good illustration of a $\pm$ picture, and for ready comparison with the larger one.

January, 1861.

A PLEA FOR THE RESIN PROCESS.

By J. Glover.

[Read at a meeting of the North London Photographic Association, March 27, 1861.]

By request of your worthy Vice-President, I beg to bring before the notice of your Society the merits of a process which has been pronounced by him to be "unsound in principle and uncertain in its results." This, at first glance, might be considered an unthankful office; but I assure you it is not so, for I shall be amply compensated for my feeble attempt if I can only engage a small share of your attention, and so elicit a useful discussion.

The ground on which I propose to take my stand is, first of all, to demonstrate as briefly as possible its *simplicity*, and then to meet the charges which have from time to time appeared against the "resin," or more appropriately the "Despratz" process.

In urging the first point for consideration, allow me to ask what formula can entail less complexity than one in which the sensitive surface requires *no application of a preservative*, but simply washing with an indefinite quantity of spring water—that succeeds with an acid silver bath—and that developes with all the rapidity of moist plates? How many photographers, worthy of the name, are there who, after arriving at excellence little short of perfection in wet collodion, shrink from the difficulties which have hitherto attended the manipulation of dry plates, and who, from motives not altogether pecuniary, refuse to adopt those prepared by the agency of others? Such individuals would hail with the highest degree of satisfaction a dry process combining simplicity with a tolerable degree of sensitiveness. The writer affirms—and it is the experience of every one who has followed out the process under consideration—that no other one approaches so nearly to the manipulation of wet collodion; for, I ask, in what does the difference consist but in copious washing and the usual precautions in drying? I can state with the greatest assurance that any good negative operator can produce, with suitable materials, a successful dry resin plate. So much for simplicity.

The *objections*, real and imaginary, which have been urged against the process, I have no doubt, have deterred many from giving it a fair trial. They are, however, happily overcome without difficulty. The foremost—and which, if well founded, would have proved altogether fatal to its adoption, and stamped it as unsound in principle—is the alleged deterioration of the bath from the introduction of such a carbonaceous substance as resin. This, however, as far as I can learn, was only hinted at theoretically. Far from being sound doctrine, I find practically that, in the homœopathic doses which are recommended, it is perfectly inert as regards any action

upon the silver solution. After using a bath for a whole season, the plates last immersed in it were, if anything, more sensitive than those prepared at the commencement, and without any of the effects attendant upon an excess of organic matter in the solution. This is not alone my individual experience: it is borne out by several of my friends. It rests with those interested in the chemistry of our art to determine what is the effect upon the film itself. Irrespective of the mechanical action, I would suggest—Is there not some chemical change—viz., the precipitation of *pinate of silver*—which partially accounts for the preservation of the collodion in the sensitive state, as well as the amount of that sensitiveness?

The next two, and by far the most general, objections, are the *liability* of *the film to become detached from the glass* during development or subsequent washing, and the *existence* of *small circular insensitive spots* which remain transparent after prolonged action of the developer.

If a suitable collodion, with the minimum quantity of resin (say a quarter of a grain to the ounce) be employed, these defects are entirely obviated. Supposing a sample of collodion, suitable in every other respect, should show a tendency to leave the plate, if, prior to moistening, a camel-hair pencil, dipped in benzole varnish, be passed round the edge, an otherwise tender film will remain intact. The collodion I recommend is one composed of about two-thirds cotton and one-third paper pyroxyline (both produced from acids at medium temperatures), iodised with cadmium salts, used as soon as in good working order for wet plates, and that does not give, under such circumstances, an intense image. It should stand two or three days after the addition of the resin, and be decanted for use. Such a collodion, sensitised in a forty-grain silver bath, containing from three to four minims of glacial acetic acid to the ounce, will endure the thorough washing it is then to undergo—remembering it is the *last traces* of free nitrate that retard the sensitiveness of dry plates. I recommend *spring* water, so as to ensure, by chemical agency, this desideratum, and is much safer than adding a chloride to pure water. It only remains to dry spontaneously, carefully excluding dust, without confining in a moist atmosphere.

The third difficulty is the *splitting up of the film* on drying the finished negative. The cause is obvious—the employment of too contractile a collodion; nevertheless, should it prove otherwise suitable, a certain remedy has been suggested by my worthy friend, Mr. Corey, and consists in flooding the plate with dilute albumen previous to the final drying.

The fourth and final difficulty with which we have to contend is *want of density*. This is not so much a characteristic of the process, but, as previously stated, the kind of collodion most suitable is prone to this defect (if such a term is rightly applied); for I find no difficulty in obtaining the necessary amount of intensity, with absence of hardness, by using a strong developer—never less than three grains of pyrogallic acid to the ounce of water.

I would urge at this point the question—Is not this seeming drawback rather to be viewed in the light of an acquisition? In most dry processes we have complaints of the opposite tendency, so much so, indeed, that it has been a by-word among the votaries of the wet process, who, on criticising one of those pictures displaying stronger contrasts than ever existed in nature, naturally exclaim—"Surely this is from a dry plate! is it 'gelatine' or 'oxymel?'"

Having thus hastily glanced at the difficulties, allow me, in conclusion, to give my experience as to the comparative sensibility of the various dry processes, to which I have given a fair trial.

Taking "Resin" as the standard, which I find to be the most sensitive of any by a published formula....	1
"Fothergill," with chlorided albumen	1½
Do. original formula	2
"McNair"	2
"Oxymel," on unwashed collodion	3
"Gelatine" (Patent Dry Plate Co.)	4

The above were all treated the same as regards their development.

Memoranda relative to specimens to illustrate paper.

NEGATIVES.

No. 1. Prints very well; has sufficient intensity.

No. 2. Failure. Under exposed. Sent as an illustration of over resinised collodion. Spotty, and film tender.

Nos. 3 and 4. Under exposed, and as hard as it is possible to make these plates. One displays a hopeless case of varnish fever.

The above were all prepared with collodion of the kind recommended for the process, excepting No. 4, which was a mixture of Ponting's and Thomas's, which answers, although it is tender and less sensitive.

AN APPEAL TO PRACTICAL PHOTOGRAPHERS.

By Alfred H. Wall.

(*Continued from page* 102.)

Photographers too frequently look with an eye of jealousy upon the artist, because, regarding all art as purely imitative, they cannot conceive a work of the hand and eye as more perfect than the results of a process which they regard as infallible. Hence it was that when such artists as Sir Charles Eastlake, Sir William Newton, Rejlander, and Lake Price came amongst the photographers, mutual misunderstandings soon estranged and separated them. If an artist, venturing out of his native element of art, made a false step in his chemistry, some eagle-eyed scientific photographer swooped down upon him, and held him up to ridicule and laughter; and if a scientific photographer, rashly invading the domains of art, advocated some glaring artistic blunder or piece of evil taste, up rose the representative of the palette, and down went the gauntlet once again.

Now, however, happily a change is taking place. We know that our lenses require artistic management; that our knowledge of pictorial science must give our chemical knowledge its real value; and that mechanical perfection helps us to artistic results only when we have the power of using such judiciously. The hand may be there, but it wants the head to guide it: the body may exist, but it wants the soul to animate it. Let us therefore cultivate, not this or that branch of photography, but *all* its branches. Let us aim to bring together and unite harmoniously every element of our art's success, so that our societies may be formed of artists, opticians, mechanics, and operators, bound together by a love of the art they practise, and working out practically the grand problem of its ultimate perfection, undisturbed by petty jealousies or idle controversies—working not with words only, but with words and works.

To embody the progress which may thus arise, we shall look to our Societies' Photographic Exhibitions, which will thus become the medium of communication between us and the public, and fight our art's battle against adverse critics.

My sole object in this paper is to advocate the practical. To this end we need our best efforts. We must not be content with bringing this process out and that modification forward, but rather direct our efforts towards the perfection of existing processes. Novelty has great attraction; for he who brings forward the veriest trifle of a discovery has been more lauded and honoured than the steady plodder who conducts us slowly and surely onwards to perfection. Here, then, we want a little reform. Let the palm be given to the practically useful—the meed of honour to the doer of good things, rather than to the suggestion of idle or unprofitable experiments.

To simplify and render more certain every step in the practice of photography is one of our tasks; and here I cannot do better than quote a writer in a recent number of the *London Review*, who, writing upon "Photography as a Fine Art," says:—"When its processes become more manageable (as much so, in fact, as the crayon in the hands of the painter), then will photography approach still nearer to a high place among the fine arts; for, inasmuch as being less dependent on manipulation, there will be more room for the exercise and display of the artistic faculty. Every year brings us nigher to this desired consummation;" and if, united by a common love of our glorious art, we all work together, as our various acquirements and experiences dictate, each labouring to perfect that element, branch, or process with which he is best acquainted, we cannot fail so to improve the character of our photographic exhibitions that the stigma of the mechanical will be laughed to scorn, both by the photographers and the public.

While speaking of exhibitions, I may perhaps be permitted to express my very high appreciation of a system adopted by the Photographic Society of Scotland—that of awarding medals as prizes for the best photograph exhibited. The value of such prizes will depend upon the real merit of the qualities for which they are awarded, inasmuch as it is the honour implied, rather than the intrinsic value of the medal, which renders them so desirable. Of course I need not therefore add that, while the judges, being thoroughly able and competent gentlemen, should be guided by the success achieved, they should rather reserve such prizes altogether than award them for acquirements or specimens of an inferior description. The greatest success of the highest nature should carry off the prize. The simple medal then represents more honour, and is, consequently, more eagerly desired and more earnestly sought—thus best serving the high purpose for which it was intended.

In concluding these few suggestive remarks, I again take up my text, and repeat that, for real progress, both upwards and onwards,

we must look to our practical members. Whatever we do, let us now, at least, be practical. We may sometimes feel, when discussing a piece of mechanism, or some point of simple manipulation, that such an employment has but little identity in comparison with the high flights we have taken into the loftiest heaven of science; but our art is a peculiar one, embracing, as I have shown in my opening remarks, the noblest and the meanest—the loftiest and the lowliest; and the highest flight of science may depend for its ultimate eminence upon some lowly piece of mechanical ingenuity or manipulatory tact. Therefore, whatever the nature of our work, let it be earnest and practical, whether it be claimed by Mechanics, Science, or Art.

Gentlemen, I will not now detain you any longer: already, perhaps, I have exhausted your patience; but I could not resist the opportunity of placing before so influential a society, for consideration and discussion, the few preceding suggestions. If, in so doing, I have made a mistake, I can only ask—what I think, in consideration of my earnestness, you will kindly grant, viz.,—a full pardon.

STEREOGRAPHS.

Scenes and Scenery in Java.—Negretti & Zambra, *London.*

We apprehend that there are but few persons who would be disposed to question the correctness of the assertion that one of the chief advantages of the stereoscope is its power of making the stay-at-home intimately acquainted with the scenery in foreign lands. Even the most inveterate rover, who has the requisite time, means, and energy at command, cannot visit every place; so that all may on some occasions profit by the labours of the skilful photographer. Messrs. Negretti and Zambra have recently published a most valuable and interesting series of illustrations of a locality comparatively but little known—thus adding another leaf to the many laurels already won by this very enterprising photographic firm. For exquisite delicacy of detail and beauty of effect it cannot be denied that proofs upon glass far surpass those upon paper, though they possess also some drawbacks, amongst which their much greater liability to injury and greater cost are not the least.

Until we had seen the series now before us we had never been able to realise so vividly the actual appearance of tropical scenery. Accurate drawings may go far towards imparting some notion, and ordinary photographs still more; but, for bringing the thing itself before the eyes of the beholder, commend us to well-executed stereographs upon glass plates.

How pleasant it is to remain quietly in one's easy chair and explore the intricacies of a fine Forest of Cocoa Palms, at Solo (No. 13)! How strange to one accustomed only to European scenery! The tall naked stems, permitting the eye to penetrate far into the recesses of the forest; while the quaint-looking tufts of large pinnate leaves on the top, like huge bunches of green feathers, throw a welcome shade beneath. Another group of Cocoa Nut Trees, at Solo (No. 14), is very artistic in composition, the light and shade being well balanced; and the graceful curves of the luxuriant leaves have their value enhanced by the rigid angularity of the huts beneath their shade. Still more strange and picturesque is the slide No. 17, representing a Native Hut, Djockja Karta, in which trees of a more familiar style of foliage mingle and contrast with the majestic cocoa palms; while the hut itself appears constructed for the express object alone of securing shade and coolness at the smallest possible expenditure of means, being formed chiefly with a roof of a kind of thatch on walls of matting. The Campong Prawen, Buitenzorg, is a more pretentious series of residences, dotted about the broken ground in much admired disorder.

A Group of Tropical Fruit, disposed *à la* Lance, contains a mixture of the strange and the familiar to a West Indian eye. The bread-nut, the mammee apple, the bunch of cocoa nuts, the sugar apple, the pine, the melon, and huge bunch of luscious bananas, are easily to be recognised; but they are commingled with about an equal number of kinds as strange as they are curious in appearance.

The Travellers' Tree is a very singular specimen of local vegetation, resembling a huge fan, the leaves being arranged symmetrically, very like the little implement with which a Spanish beauty does so much execution, only that the blades, instead of overlapping one another, are arranged edgewise, each leaf, when turned a quarter of a revolution, presenting the appearance of a torn leaf on a very long footstalk.

A View from Batoe Toclis (No. 31) is a marvel of photographic skill, embracing as it does an enormous extent of distance, the furthest hills being some twenty miles off; while the long windings of a shallow river, meandering around the clumps of palm trees, and widening into a species of lagoon by a village in the middle distance, and a tall bank, covered with some kind of brushwood, in the foreground, unite to form a subject not a little trying to render satisfactorily by photography. There has evidently been one point in the operator's favour, and that no trifling one—an atmosphere of a purity almost unexampled in our own misty land; but, notwithstanding the beautiful clearness of the whole, there is no want of aërial perspective, the whole composition being pervaded with a charming atmospheric effect. This slide will certainly command many admirers. No. 32, another view in the same locality, is also particularly well executed.

Amongst the most instructive slides we must not omit to mention a Rice Plantation, which appears to be located on a sort of irregular plane at the base of a valley, on the borders of a stream which serves to irrigate the land, for nearly the whole of the "plantation" is *under water*. What we presume we must, in courtesy, term "fields," are in fact a series of irregular ponds, more or less of a rectangular form, divided from one another by a narrow strip of land, serving apparently the double purpose of a footpath and a hedge. The blades of young rice are just showing above the water; and in the middle foreground is a raised bank about six feet higher than the general level, and probably fifteen to twenty feet wide, also divided into compartments filled with water and growing rice. The figure of a man, clad in white, standing with his back to the spectator, appears to be superintending some agricultural operation. The background consists of the wooded slope of a hill, and the view on either side is limited by masses of foliage. This slide presents a very novel appearance to those accustomed only to European cultivation.

As an appropriate sequel we have No. 37, Village and Paddy Fields, Karampandang, the latter stretching far away up the slope in regular steps. Irrespective of its interest, as exhibiting scenery of an unfamiliar character, it possesses much artistic beauty.

A very pleasing one for the last mentioned quality is No. 12, labelled Plantation Grove, Golo, which we fancy is miscopied for Plantain Grove, seeing that a goodly number of these palms border the sinuous little stream in the centre. Mixed with the plantains are many other trees and shrubs of various kinds, some with exceedingly delicate foliage; and these, combined with the sluggish little stream before mentioned, are composed into a very exquisite picture.

No. 21, Sunset, is a fine study of clouds, with the mist rising amongst the trees of a dense wood.

We now come to some slides illustrative of Javanese customs; and one of the most valuable of the series is No. 26, representing a Concert under the shade of the Warringhim Tree, Passorocan. This slide possesses the highest interest. The tree named is itself a vegetable wonder, and the grouping of the musicians picturesque; while the instruments upon which they are performing are of a class quite unknown to Europeans, many of them being large, not unlike elaborately-carved sofas in appearance, while at the back of the group are suspended a huge drum and corresponding couple of gongs, and a series of hollow vessels in graduated sizes, somewhat resembling in form and size immense carboys.

As a companion to the preceding we notice A Theatrical Performance or Wayang, which, like the concert, is taking place out of doors. In addition to the performers, some of whom are seated on stools. a portion of a very numerous audience is seen in the background, all sitting cross-legged on the ground. Of the figures seated on the stools nearly every one has adopted the same attitude, the legs being stretched wide apart, and the arms extended in a similar manner, with the hands resting on the knees—the whole figure thus presenting a somewhat grotesque resemblance to an arm chair. This slide will well repay long and careful examination.

No. 40, Javanese Actors, contains the portraits of two of the principal performers mentioned in the preceding. In a companion slide we have portraits of four of The Dancing Girls of the Sultan, decked in all their finery, *not* set off by crinoline.

No. 43 is a Native Girl at her Lace Work, an illustration which will serve better than volumes of written description to give an idea of the female inhabitants of Java. The walls of the apartment in which this young lady is seated consist of matting, having a kind of damask pattern, and strengthened by light wooden supports. The furniture consists of a broom, an umbrella, a kind of chafing-dish, and a very rudely-constructed low chair,

on which the girl is seated, in a half recumbent posture: before her is stretched the lace on which she is working, thrown across a kind of clothes-horse.

The girl herself deserves some description, being, we believe, a young Javanese beauty. Her expression is mild, and by no means deficient of intelligence: the hair is drawn all off the forehead, and combed straight back, much in the same style as that adopted by some of the young ladies in our own land; but, in the case before us, rolled into a knot at the back of the head, instead of being confined in a net. The garments consist of a species of scarf, wound around the trunk, to form a boddice, leaving the arms, neck, and upper part of the bosom bare, and a large shawl wound round the lower part of the figure forms the skirt. Of shoes and stockings she has none; but instead of the former a pair of clumsy wooden clogs, which, while sitting, she has cast aside. She appears to be well formed, plump, and with limbs nicely rounded. Although she has quite attained to the maturity of womanhood, we understand that her age is but a little over *thirteen years*.

We have taken this description partly from the slide we have just noticed and partly from another, in which she is seated at an open window, through which a very beautiful view of Javanese scenery is obtained.

This last is very cleverly managed, being a sort of *tour de force*, and one that would not answer in a commercial point of view, the figure being printed upon the front glass and the landscape on the back one, the corresponding portions from each having been carefully removed.

The whole of these slides are printed upon albumenised glass by direct contact in the pressure-frame, and we have been informed by Mr. Negretti that the negatives from which they were printed having been taken upon collodion, a serious impediment has thus been interposed to the production of what he regards as first-rate results; because it is almost impossible to obtain a sufficiently close contact between the negative and plate on which the impression is to be taken without tearing up portions of the collodion film. Mr. Negretti strongly advocates the employment of simple albumenised glass for negatives, and considers that any extra trouble involved in using them is more than compensated by the increased value of the negatives, both in an artistic and commercial point of view.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

No. II.

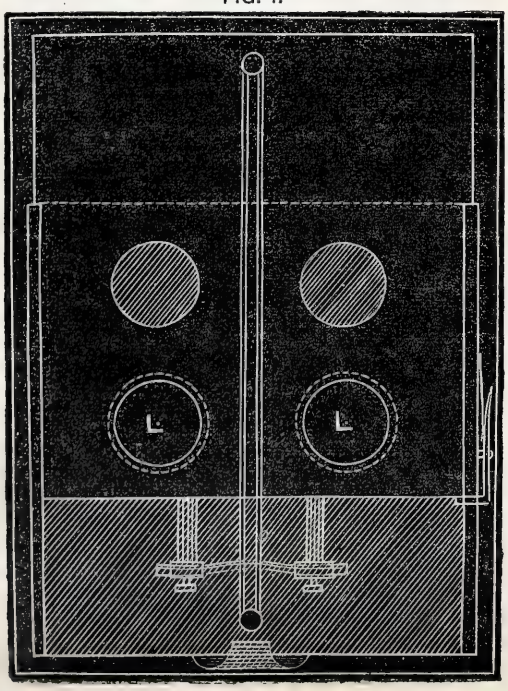
INSTANTANEOUS SHUTTERS.

(Continued from page 105.)

Group II.

Shutters that uncap and cap the lens by means of a plate passing perpendicularly or horizontally in front of it are referable to one type, which will serve for the comprehension of all the inventions that belong to this group.

FIG. 1.



A frame of brass or wood, having two caps attached to the back by which it is fitted to the lenses of the camera, is pierced with two apertures corresponding to the position of the lenses (L L). On each side of the front of this frame grooves are cut, in which a plate of brass slides freely. This plate is pierced in its middle portion with two apertures, and is of such proportions that there is a width of metal above and below these apertures equal to the diameter of the lenses employed; so that when this front plate is pushed *up* its lower portion covers the apertures (L L) in the back frame, and is retained in this position by the catch of a trigger fixed at the side of the frame. An India-rubber band is stretched from a pin, screwed into the lower edge of the back of the frame, on to another fixed on the back of the upper edge of the front plate. When the trigger is pulled the spring (which may be varied in power) draws the plate downwards; the apertures in the central portion corresponds for an instant with those in the frame, and passing onwards the upper portion of the plate covers them, thus giving the sensitive film a very rapid exposure.

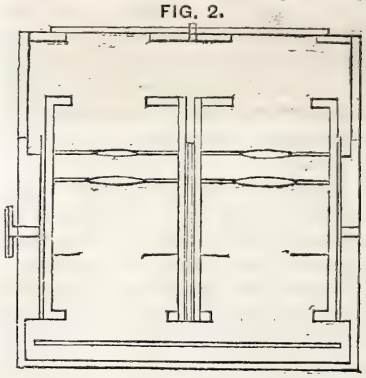
Mr. Lake Price was, we believe, the first to describe, in his work on *Photographic Manipulation*, page 165, an arrangement of this kind. Messrs. Murray and Heath afterwards produced a very neat improvement on his arrangement, made entirely in metal, with the addition of a piece of stout India-rubber tubing placed so as to break the concussion caused by the action of the spring shown at the top of the diagram. We have likewise seen an arrangement on this plan at Mr. Melhuish's. Mr. De la Rue adopts a similar contrivance for Lunar Photography—the front plate being propelled simply by its own weight (as in Lake Price's instrument), but being released by burning in two with a lucifer match a thread that holds it in position.

All these are placed externally. Mr. Leake, however, places his arrangement within the camera behind the lenses; and the motion of the exposing plate instead of being perpendicular is horizontal, so as to meet the proportions of the front of the camera.

Group III.

Mr. Sutton, in his *Dictionary of Photography*, describes an arrangement which consists of a disc of metal centered on a pin placed between the lenses *(Fig. 3)*, which are covered in by an extension of the camera front *(Fig 2)*, as in Murray and Heath's camera described in our last number. Two apertures are pierced in the disc, and are made to stand vertically to the lenses by aid of the weight of a heavy handle fixed to the lower edge of the disc: thus the uncut portion covers the apertures of the lenses whilst the disc is at rest. The exposure is given by a rapid semi-revolution of the disc, the handle securing its return to the covering position.

FIG. 2.



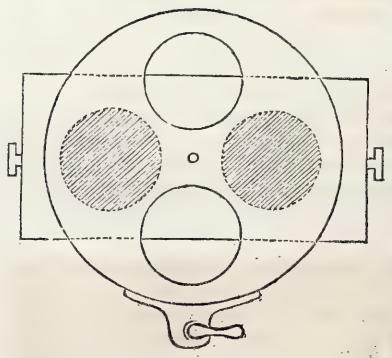


FIG. 3.

Mr. Shadbolt's arrangement is somewhat similar. The lenses are covered in by an extension of the camera, the front being pierced with two apertures, which are covered by a narrow plate of brass that works on a pin between them. This plate is fixed in position by a trigger catch which, on being released, allows a steel spring to act on the covering plate so as to impart to it a semi-revolution, thus causing the lenses to be exposed and again covered with great rapidity.

In both these arrangements the exposure commences with *the foreground* on one half of the plate and *the sky* on the other half of the plate, so that at the beginning and end of the impingement of the view the exposures of each picture are not *absolutely* simultaneous; but as the action of both these contrivances is very rapid it is questionable whether, under any circumstances, this diagonal method of exposure is in practice objectionable.

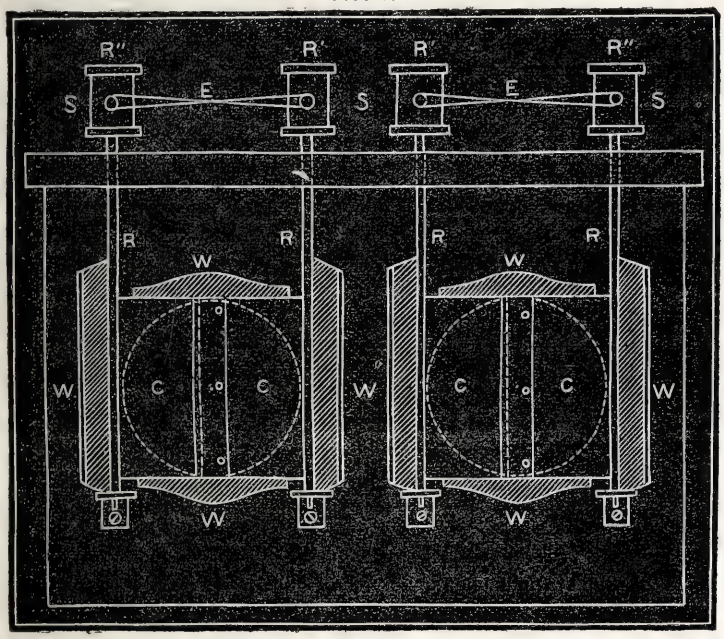
Mr. Ross adopts a very simple arrangement for his small stereoscopic lenses when mounted in pairs. It will be recollected that

these lenses are closed by a little disc screwed to the front of the mount, which cover and uncover the lenses by a diagonal motion. To the bottom of each disc a little binding screw is attached by a hinged piece; a steel rod passes through both the binding screws, and is clamped at whatever distance the lenses may be separated from each other. By a rapid side motion both the covering discs are drawn aside by aid of the connecting rod, and again restored to their covering position.

GROUP IV.

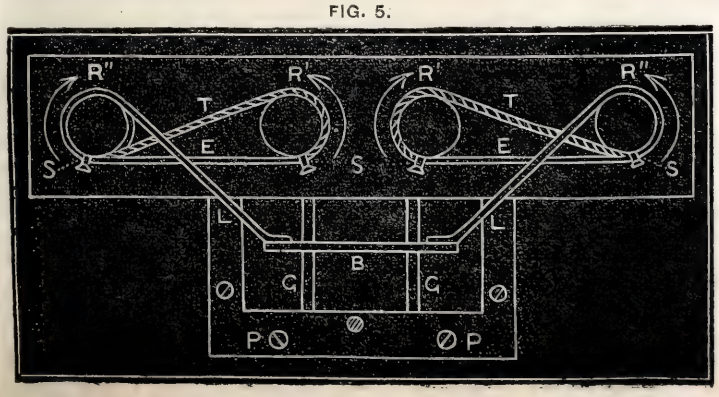
Mr. Skaife's ingenious arrangement, originally invented for his "Pistolgraph," has never been fully described, though often referred to at meetings of societies, &c. I therefore take the present occasion to give the details of its construction, and in the form most suited for the photographer, viz., mounted for use with a twin lens camera, when it may be placed in front of the lenses or behind them, within the camera itself. I shall describe the latter arrangement.

FIG. 4.



Two apertures, indicated by the dotted lines in *Fig.* 4, are cut in a wood frame that slides into a groove (in the same way as a focussing glass is fitted) placed immediately behind the lenses. On the side next to the plate frame a pair of shutters (C C) are riveted to a pair of steel rods (R R) about the size of knitting needles. Each pair of shutters are made of slabs of vulcanite about the thickness of a stout card, and open in the centre like a pair of folding doors. Each shutter is 2¼ inches by 1⅛ inches in dimensions. A slip of vulcanite is attached to one shutter of each pair, so as to overlap the central slit; and slips of wood (W) are fitted round the edges of the shutters, so as to exclude light. The rods (R R) form the hinges of the shutters, as their lower extremities drop into little brass brackets, and their upper ends pass through the thickness of wood, in the overlap of the frame, so that they can rotate freely. To the external end of each rod a little wooden reel (R') is attached. Into each of these screws (S) are inserted, and over each pair a piece of elastic cord (E) is stretched, in the manner shown in the diagram. Thus the shutters are kept quite closed, the contractile action of the cord forcing the reels (R')—into which their hinges are inserted—towards each other in an inward direction.

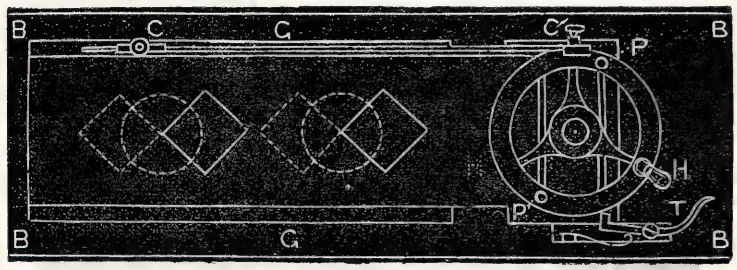
FIG. 5.



So much for the arrangement when at rest. It now remains to describe the contrivance by which the shutters are rapidly opened and closed—the details of which are purposely omitted from the previous diagram for the sake of perspicuity. Two strips of leather (L L), each piece having a slot cut in it to allow of the passage from screw to screw of the elastic cord (E) and the packthread (T), are fixed to the outside reels (R'') by the screws (S S). Two pieces of packthread (T T) pass from the screws on the outside reels to those on the inner reels (R'R'), in the manner indicated in *Fig.* 5. The inner ends of the strips of leather are riveted to a plate of brass (B), called "the mail," which is perforated with two holes, that traverse over two steel wire "guides" (G G) fixed to a brass frame that is screwed to the top of the camera. It will be seen that if *the mail* is pulled back the leather strips will pull the *outer* reels (R''R'') round in the manner indicated by the arrows; and as the threads (T T) will be simultaneously acted on, the inner reels (R'R') will also be pulled round, as indicated by the arrows. The consequence of the reels, and with them the steel hinges, being forced round by the inward pressure on *the mail*, is that the shutters are turned outwards or opened. As soon as *the mail* is released the elastic cords (E E) re-act on the screws in the reels so as to pull them towards each other, and the reversed action of the arrangement causes the shutters to be closed. *The mail* may be forced back and then freed, simply by the tip of the finger, and an instantaneous or longer exposure can then be given at pleasure; or it may for instantaneous exposures be acted on by the mechanical aid of a trigger, which on being released strikes *the mail*, forces it back for a distance sufficient to cause the shutters to be opened; then passes over *the mail*, which, being released, allows the elastic cords (E E) to react and close the shutters again.

Mr. Hockin has introduced an arrangement that is extremely rapid in action, the construction of which will be understood by aid of the annexed illustration.

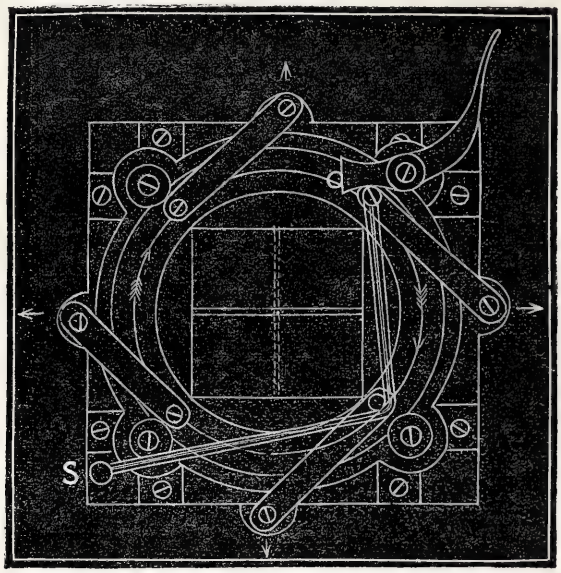
FIG. 6.



A mahogany base board (B) is fitted with two caps, by which it is attached to the lenses. On the front side brass grooves (G G) are screwed, within which two brass plates work smoothly over each other. Both plates are perforated with two diamond-shaped apertures, so adjusted that in two positions they overlap, so that the apertures of the lenses are closed, whilst in an intermediate position the apertures are fully exposed. At the right-hand side of the board a grooved wheel rotates on a central pin that passes between the ends of the two plates. At the end of each plate a slot is cut, into each of which a pin (P P') fixed on the margin of the wheel fits—one pin (P) resting at *the bottom* of the slot on the front plate, and the other pin (P') at *the top* of the slot in the under plate. An India-rubber cord is fixed at the left-hand side of the board by a clamp screw (C), and the other end is clamped to the edge of the wheel at C. At the right-hand side of the wheel is a handle (H). The apparatus is arranged by rotating the wheel till the handle occupies the position indicated by the dotted H. This stretches the elastic cord round the margin of the grooved wheel. As the wheel rotates the pins (P P'), acting in the slots, force the two plates asunder, so that the diamond-shaped apertures change sides; but they again overlap so as to cap the lenses. The wheel is then fixed in position by a trigger (T) fitting into a notch in its margin. On releasing the trigger the India-rubber cord reacts, and forces the wheel back to its primitive position; and, as the two plates again glide over each other, through the reversed action of the pins in the slots, the diamond-shaped apertures coincide for *an instant* with the apertures of the lenses, and thus a very rapid exposure is obtained.

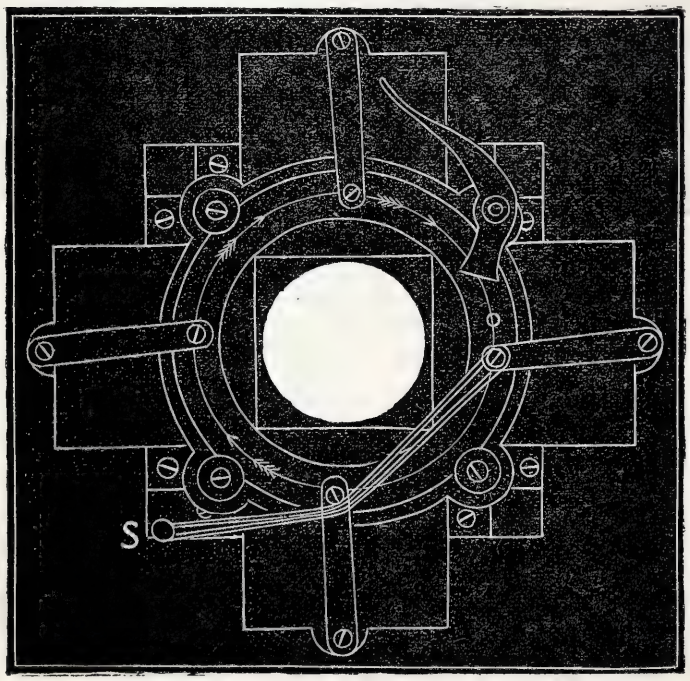
Mr. Hockin has likewise a very ingenious and beautifully-constructed model of an improvement on the previous arrangement, made by A. Salvin, Esq., the architect of the Zoological Gardens. This consists of a pair of front shutters and a pair of back shutters, made of thin brass plate, both pairs *meeting* in the centre of the arrangement when adjusted, as shown in *Fig.* 7. Each shutter

FIG. 7.



is connected by a crank to a brass ring fixed to the frame plate by another overlapping bevelled ring. A vulcanised India-rubber band is attached to a pin at S, which passes over a fulcrum on the right-hand side of the frame (formed by a pin to which one of the cranks is hinged), and then is fixed on to a crank pin just below the trigger that fixes the arrangement ready for action. On the trigger being pulled the elastic band reacts, and the inner ring is forced round in the direction indicated by the arrows; and at a certain position all four shutters are forced outwards by the action of the cranks, as shown in *Fig.* 8—so that the exposure is effected, and

FIG. 8.



the ring still being forced onwards by the contraction of the band, the shutters are then forced inwards and closed. The action of this arrangement is extremely rapid. If the spring were removed this contrivance would be admirably adapted for a dissolving view apparatus, as just the kind of gradual opening up of one view and closing in of the fellow one might be imparted to a pair of such shutters as is desired.

Some authorities, on theoretical grounds, raise an objection to all shutters that open from *the centre*, from being likely to increase the already existing tendency to inequality of action between the centre and margin of the lens. We can only say we have seen very good views taken by such arrangements, though, from their greater simplicity and equal effectiveness, we should prefer working with an arrangement pertaining to the first or to the second type described in this article.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. IV.

The conclusion of the last article left me enjoying myself in Malta, with a promise that I should leave the following day for the Holy Land. I did leave Malta on the 2nd of May, in the *Borysthene*, one of the best of the French mail steamers, bound for Jaffa, calling on the way at Alexandria. As I have mentioned before, I do not *enjoy* the sea, my readers would most likely still less enjoy a description of my voyage. A fast steamer would make the harbour of Alexandria from Malta in three days: the French Company's time bills allow four days; and I believe they generally require that time. The *Borysthene* left Valetta on Wednesday afternoon, and with her sailing qualities she could have made Alexandria easily on Saturday evening, if there had been anything like "pluck" in her officers. As it was, we just got in sight of the city of the Ptolemies when too late to get a pilot, as Arab pilots restrict their hours of labour to the rising and setting of the sun. The French make poor sailors. The officers are stiff and formal, looking every one the impersonation of red-tapism, while the "before-the-mast" part of the crew are a sad set of lubbers—mean, slavish-looking fellows, with a miserable *physique* compared with our own brave, weather-beaten, but manly-looking "Jack." Sunday morning, with early dawn, we were steaming into the harbour of Alexandria, and I would soon be landed on (to me) a new quarter of the globe. I was only likely to spend six-and-thirty hours in the land of Egypt at this time. Grand theme though! Capital opportunity for becoming poetical, historical, or more easily rhapsodical! As I intend returning by Alexandria, my readers will, I presume, be quite willing I should defer my performance in these departments of literary industry till then.

The steamer lay at anchor in an immense harbour capable of containing thousands of such vessels, and we were landed by boats—the owners of myriads of them hurrying about among the passengers soliciting custom to their boat in every European language, with Arabic, and I know not what added, to make up the Babel. My dragoman knew the place and its customs: so, tamely submitting myself to him, I soon found myself seated at the breakfast table of the Hotel de l'Europe.

Alexandria looks quite as motley as its inhabitants undoubtedly are. It is in every respect an aggregation of very various elements. Architecturally it is generally very low. There is a large square or *place*, as the French would call it, and which the Pasha has much improved this summer. The hotel we were for the time domiciled in is in this *place*, and around it there are numerous public hotels, and the residences of the various consuls and eminent merchants, &c.—all high Parisian-looking buildings. Indeed, except a very fine church in this same square, in connexion with the Anglican Church, everything in Alexandria above the merest hovels have a French aspect. Generally it is a very dirty, mean-looking city indeed. The streets are narrow and crooked. There are few remains of antiquity. My commission did not require me to photograph anything in Egypt at all—at least till I had done Palestine—so I had nothing to do but see the "sights," like any other Jones, Brown, or Robinson. Sunday was a *sirocco* day. Those who have been in the East know what that means. What a boiling heat! what an overpowering, depressing influence hangs over the strongest-nerved on such a day! It would have been impossible to photograph the nearest objects, there was such a dense cloud of sand floating in the air. The buildings on the opposite side of the square were just barely visible. I was Scotch enough to hunt up a place where I could hear a Scotch sermon. Good, earnest man, the minister had not a large congregation, and I doubt if two of them were of the same nationality.

Everybody that visits Alexandria must see Pompey's Pillar and Cleopatra's Needle, and make the acquaintance of the Egyptian donkey-boy and his "very good donkey." I had no wish to be exceptionable; so early on Monday morning I left the hotel with the "very good donkey-boy" as my guide. Cleopatra's Needle I found to be situated in what seemed a builder's yard. I felt more interested in the fine view of Alexandria to be got from a point near it than in the Needle itself. My readers know as much as I do, perhaps, about this remarkable monolith. There is the other Needle, too—the English one. It is here in the same place, just below the Cleopatra one—quite or very nearly covered with sand. We looked for it but could see nothing, till our guide pointed to a hole in the sand, when, on close inspection, we saw it, with characters engraved on it similar to those on the one standing erect; but I could form no idea of the dimensions or entireness of *our* Needle.

Why does not some enterprising M.P., in want of a theme for his eloquence, take up this, and compel the existing government, or any future government that may be formed, to take it up too, and have this interesting relic of antiquity brought to Old England, that Cockneydom may boast of as old and as wonderful an obelisk as that which adorns the gay and beautiful Place de la Concorde, with the satisfaction—a great matter to an Englishman—that it was rather more honestly come by than that of our Gallic neighbours?

Pompey's Pillar looks very like its pictures—more than can be said of many such Old-World remains; and the stream pointed out as the Nile showed no peculiarity which one could lay hold of or remember, being more like a canal than a river; but the same might be said of many English rivers.

The country around Alexandria looked well. The palm tree is common, and grows luxuriantly. One sees it everywhere. While I was in Alexandria there were several smart showers. I remembered having heard that romancist lecturer and traveller, J. Silk Buckingham, expatiate to a great length on the dryness of Egypt. Some of my readers may have heard his story of the Pasha who could not be made to understand what rain was, as he had never seen anything like it. The amusing lecturer added that, after he had done his best to convey to his regal pupil a comprehension of what rain was, the Pasha, to show how well he had taken up his instruction, had a pail of water poured over the head of Mr. Buckingham, adding, as it was being done, "that is rain!" Well, the story showed how familiar Silk Buckingham was with a Pascha; but beyond that it was a grave "sell."

There has always been rain at times in Alexandria; and within the last ten years it has been frequent all the year over, and in winter much rain falls. In Upper Egypt there is less: in Cairo there is rain occasionally. The change is accounted for by the more general cultivation of the ground. My informant, who is well able to give an opinion, believes there will, in a few years, be as much rain as we have in many parts of Europe, or as much as they want, at any rate. It is the same in Syria; but of this again.

A day and a-half brings us from Alexandria to Jaffa, where we are to disembark for Jerusalem.

Jaffa (Yaffa the Arabs call it) is the biblical Joppa, where Jonah embarked on his unlucky voyage to Tarshish, and where Simon the Tanner lived, on whose housetop the Apostle Peter saw the vision of clean and unclean beasts and creeping things, and heard the voice saying, "Rise, Peter; kill and eat."

Jaffa is the most usual place of landing for Jerusalem. It is the nearest port, if port it can be called, for there is *no natural* harbour, and nature has been left quite unassisted; the consequence is, that more boats are upset here than all along the coast put together, and no steamer can attempt to land passengers but in smooth water. The contract with passengers is something like this:—If the weather be very fine we will lie off Jaffa, and allow you to trust yourself and goods to the tender mercies of the rocks and waves and your Arab boatmen.

On this occasion the weather was just sufficiently propitious to allow us this privilege; and it certainly is a rather nervous affair to land in such circumstances—to me peculiarly so. Everyone of my valuable boxes required to be carried from the steamer into the boat on the back of a rough fellow, who could never comprehend a tithe of the harm done if he too roughly jolted one of my boxes of glass. Or, worst of all, thought I, what if he drop one—perhaps the one with the camera—into the sea! To the credit of the Arab boatmen I must say they did their duty nobly. My traps were all safely deposited in the boat with a celerity quite unaccountable; and they showed more pluck and skill than I could have thought them capable of in rowing us through the narrow passage among the rocks which lay between us and the town.

Every pilgrim as he sets foot for the first time on a land every inch of which is rendered sacred by the holiest associations of which our nature is capable has, no doubt, his own peculiar sensations. To many it is the realisation of a life's aim. The dim unformed wish of childhood—the dream of youth—and the settled purpose of manhood—is then fulfilled. I was rudely awakened from my reverie by a very present hard reality. My foreign office passport demanded for me, in Her Majesty's name, free passage—not so for my baggage though. I was in the hands of the Turkish custom-house officials. I had thought I knew something of the horrors of a custom-house examination, but this exceeded all my previous experiences:—boxes all opened, and their contents inspected—not once, but five or six times over. Could not pass. What did they want? The fact was, they did not know themselves. They wanted to *rob* me, and did not know how much to ask, in order to do so. Only after getting the aid of the *cawass* of the British Consul did I learn what was the demand of Turkey. Quite absurd, of course. They valued my chargeable goods at twenty times their real value; and, after an hour's talking, which I did not understand, they took the duty on the real value. By this time the Governor of Jaffa had come on the scene, and I was expected to go through the ceremony of taking coffee with him. I refused at first, on the ground that I could not drink coffee without sugar, but forgot to add, and milk. He soon had my sugar objection remedied, and I had no choice but drink the (to me) nauseous cup, which many praise highly. Tastes differ! It may be that mine is vitiated.

The Turks seem to live for the doing of two things—smoking and drinking coffee. I can do neither as they do it.

There are two hotels in Jaffa; but the reader, in order to form any idea of what they are like, must dismiss from his mind all his previous associations connected with the word hotel. I chose the one kept by a Jew; and, as I will have other opportunities of describing the Syrian dwellings, I will leave my Jaffa inn now, further than that it was quite as comfortable as I expected. Comfortable dwellings are not difficult to get in a country where sleeping in the open air is a *luxury*, and rain and wind and shade are the things men pray for.

I felt glad I was now about to begin my work in earnest, and that if any troubles might annoy me I should have the solace of my camera ever at hand. For how completely does the enthusiastic photographer forget all life's ills as he hurries along in his ever-interesting preparations, or in his more absorbing consummatory labours, as he watches the mimic representations slowly or quickly developing before him! It is a theme worthy of some unborn laureate to tell of the albeit not unalloyed but transcendest joys of the sun-drawn picture-maker!

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Thursday evening, the 21st ult., at eight o'clock, at St. Peter's School-rooms, Walworth,—W. Ackland, Esq., Vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, the following gentlemen were proposed and declared duly elected members of the Society:—Mr. M. H. Warver (of Ross), Mr. Quentery, Mr. Price, Mr. Walter Ridley, and Mr. Samuel Fry.

The Chairman drew the attention of the members to a copy of the presentation print for the year—the subject being a very beautiful view of Coniston Falls, in Cumberland, executed by Mr. Mudd, of Manchester, by the collodio-albumen process. He said it was a fine illustration of what could be done with the dry process, as the presentation photograph of last year exhibited the powers of the wet. They hoped to present their members with specimens of the best masters in each process; and he thought that they could do no less than tender their thanks to the sub-committee for the judicious selection they had made, and to Mr. Mudd for placing within the reach of the members of the Society a picture of such a character.

A vote of thanks in accordance with the suggestion of the Chairman was carried.

Mr. G. W. Simpson exhibited a panoramic picture taken with one lens by two exposures, the two halves of the plate being turned in the right direction by rotating the camera on its stand, and was an illustration of the good effect capable of being produced by this method.

Mr. Wall (the Secretary) exhibited a very faint but distinct print prepared by placing the non-sensitised side of the paper against the negative. The photograph was printed in that way for the purpose of its being subsequently coloured—the darkness of the foliage, so much complained of by persons colouring photographs, being entirely done away with, whilst every detail was distinctly visible.

Mr. Blanchard read a paper *On Experiments on Intensifying Processes* [see page 121], and exhibited several illustrative specimens of instantaneous negatives and prints, intensified by the various methods he described.

The thanks of the meeting were given to Mr. Blanchard for his paper.

Mr. S. Fry, who had some little experience in taking instantaneous pictures, could not help admiring the course adopted by Mr. Blanchard in proceeding carefully and certainly, step by step, towards the end he had in view. Each picture was an improvement on the one before it, although they were all good, the negatives showing clearly that they had been taken absolutely instantaneously. In his opinion the thanks of photographers were due to Mr. Blanchard for the way in which he had explained the methods he had tried. He had found great difficulty in getting instantaneous pictures sufficently intense, as for a long time he developed with pyrogallic alone, which required a more complete exposure than where an iron developer was used. Therefore he agreed with Mr. Blanchard in the propriety of using an iron developer, by which process he obtained the best results. By using bichloride of mercury

and iodide of ammonium, a yellow negative was produced of considerable printing power, with an inclination to amalgamate the half-tones with the rest of the picture. Of course much must depend upon the collodion used. He considered the best for an iron developer to be a bromo-iodised one. With the exception of the last mixture for intensifying, none of Mr. Blanchard's processes seemed absolutely new, although his manipulation seemed to differ from that generally followed, and was decidedly an improvement. The last intensifying process adopted by Mr. Blanchard appeared to him to leave nothing to be desired.

Mr. Hughes could do little more than repeat the words used by Mr. Fry to express his admiration of Mr. Blanchard's method of working. The great difficulty in taking an instantaneous negative was to get it sufficiently intense; and every person who had worked with bromo-iodised collodion and developed with iron would recollect the thin, filmy, phantom-like image he invariably obtained, and then when endeavouring to intensify the picture the delicacy he was priding himself on entirely disappeared. Bichloride of mercury could, according to Mr. Hardwich, only be used with advantage in cases were half-tones were not absolutely requisite. The series of pictures brought before them by Mr. Blanchard was peculiarly interesting from having been taken under the same general circumstances, and thus fairly showing the different values of the various intensifying agents he had used. Supposing that the conditions of exposure in all the cases were alike, the last process adopted by Mr. Blanchard was out of all question the best, as giving more vigorous results with a greater preservation of the half-tones. He did not think the processes used by Mr. Blanchard were so generally known as they ought to be; but he thought they were better known than that gentleman thought they were, from the fact that Mr. Hardwich, in the fifth edition of his book, mentioned the use of the aqueous solution of alkaline iodide with some confidence, but in the sixth edition he falls back on the tincture as giving a picture less inclined to stain than the aqueous solution. However, Mr. Blanchard's practical experience was of equal value to Mr. Hardwich's. Mr. Blanchard had at all events shown them that, if they had a weak negative, they had a power in reserve by which they could render the negative stronger than they could have done by the old method of intensifying, which often left the film a miserable thing of shreds and rags. He was glad to say that the reticulated and crapy appearance of the film, owing to the presence of water in the collodion, had almost entirely disappeared since they had used anhydrous alcohols in the collodion. Mr. Blanchard stated that he had used alcoholic collodion iodised with cadmium, which rather surprised him, as both cadmium salts and alcohol had a tendency to gelatinise the collodion.

Mr. Blanchard said he obtained a most magnificent film with that collodion, whereas, when other salts were combined with the cadmium, peculiar lumps were to be seen in the film. The collodion prepared in the way he mentioned was thoroughly limpid, and left a glossy film on the plate, free from marks of any kind.

Mr. Hughes said that was totally different to what was generally believed to be the case. Mr. Sutton, who used a large quantity of alcohol in his collodion, considered iodide of cadmium unfit to be used with it, and preferred iodide of potassium. They must, under the circumstances, go over the same ground again, and ascertain whether it was to be condemned or to be regarded as a serviceable agent.

Mr. Blanchard observed that the solvents in his collodion were equal proportions of alcohol and ether.

Mr. Hughes said that might explain the different results arrived at by Mr. Sutton, who used alcohol in the collodion to excess, which was of course more likely to gelatinise the collodion. He thought Mr. Blanchard was acting very properly in comparing the old with the new processes, so that they might arrive eventually at a proper conclusion.

Mr. Fry adverted to a different method of procuring intensity, not referred to by Mr. Blanchard—namely, by superposition by the dry process, whereby a very vigorous transparency would be produced, which could afterwards be recopied either by superposition or in the camera. At any rate, they could avail themselves of it as a last resource, as the negative so produced bore no sign of being forced, but possessed all the gradation that could be desired.

Mr. Simpson recollected seeing a work in which were numerous prints of views of the Peak of Teneriffe, printed from negatives obtained from small positive collodion pictures backed with black varnish, sent over to this country by Professor Piazzi Smyth. The black varnish was washed off and camera transparencies obtained, from which a large number of negatives were taken, and from the latter the copies for the work were printed. In his opinion obtaining transparencies by superposition from weak negatives was much better than risking the danger of destroying the film of a good instantaneous negative by any intensifying process. With regard to the use of cadmium as an iodiser, he thought that if it were used with an excess of alcohol it would tend to gelatinise the collodion unless there was something peculiar in the soluble cotton employed; but with equal portions of alcohol and ether it might make a good collodion. With regard to the danger to the film in using bichloride of mercury as an intensifier, he thought that it might be in a great measure avoided by washing off the solution after a few minutes, and then applying iodide of ammonium. There was another danger which had not been referred to—he meant the use of a solution of bichloride of mercury prepared, as it frequently was, with hydrochloric acid.

Mr. Eidmans had taken an instantaneous picture of Temple Bar on the previous Monday, and had developed with iron and pyrogallic acid. He had then washed it with a forty-grain solution of silver, which he removed as often as it became muddy, and eventually he got a very excellent negative. He had tried bichloride of mercury over and over again, but had always found it a dangerous article to meddle with. He thought that iron and pyrogallic was the best developer that could be used. He had used the tincture of iodine for a long time, and had always been very successful with it. He employed a collodion prepared in the following manner:—Pyroxyline from hot acids (150°) 4 grains, ether (·730) 4½ drachms, alcohol (anhydrous) 3½ drachms, bromide magnesium 4 grains: to one part of this he added one part of Ponting's negative collodion. He developed with proto-sulphate of iron 20 grains, water 1 ounce, sulphuric acid 3 drops, formic acid 10 drops, alcohol 2 drachms. After the details were well out, he washed well and intensified with the following mixture:—Pyrogallic 1½ grains, water 1 ounce, acetic acid 1 drachm, saturated solution of gallic acid 1 drachm, to which a few drops of nitrate of silver were added. He preferred fixing with cyanide of potassium, washing thoroughly afterwards.

Mr. Blanchard, in answer to Mr. Hannaford, said the proportions of the cadmium, iodide, and bromide he used were four and a-half grains of the iodide and one and a-half of the bromide.

Mr. Hannaford said that proportion of bromide was larger than the quantity generally used, half a grain being the usual amount. He himself had used one grain, which he thought was an excessive amount, and he should have considered that where one and a-half grains were used there would be so little intensity that collodion containing it would be thrown aside by most people. That peculiar property of the bromide, however, would be just the thing that would recommend it to persons using the intensifying process, as a faint negative would be obtained, full of detail, and the deposit on the film would be very slight; and by changing this very slight deposit into a colour (such as yellow) that would entirely exclude the light, a very fine negative might be produced. He thought this method would be far preferable to piling one particle of silver over the other until that beautiful delicacy which was the great characteristic of photography was entirely lost. He had used the bichloride of mercury for intensifying; but instead of adding the iodide of potassium to the mercury, whereby a red precipitate was thrown down and left at the bottom of the vessel, he added the mercury to the iodide, which caused the red precipitate to be redissolved in the solution. Another plan was, first to use the bichloride, and afterwards to employ a weak solution of the iodide on the plate itself. Another point he would refer to was that when they had over-intensified a negative, as was sometimes the case, instead of throwing the plate away as spoilt, they had only to pour on it a strong solution of an alkaline iodide, which would restore it to its original state of a faint negative. If applied too long, however, the iodide would reduce the picture too much, leaving a weak metallic film that they could not afterwards intensify. If they stopped at the right moment, which some little experience would enable them to do, they could go on intensifying and reducing as often as they pleased. With regard to the danger of the film cracking on the application of bichloride of mercury, he thought it might be avoided by allowing the film to dry before the mercury was applied.

Mr. Blanchard observed that in one of his negatives the bichloride of mercury was applied after the film was dry.

Mr. Hannaford thought the last of Mr. Blanchard's negatives was much more promising than the first of the series, which was in some degree owing to the fact that the former appeared rather over, and the latter rather under-exposed. He might also observe that he had obtained a vigorous negative by superposition, from one so weak that it was perfectly useless for printing. In the reverse case, where a negative was too intense, a picture might be obtained by superposition, bearing all the marks of under-exposure. He thought they could scarcely do better than recommend their Experimental Committee to turn its attention to the intensifying process, as applied not only to the wet, but also to the dry process, as one of the steps toward discovering an instantaneous dry process. One of the chief difficulties in the way of obtaining a rapid picture by the dry process was its want of intensity; and, if that could be overcome, a great deal would have been done towards attaining the end they had in view, viz., the production of a vigorous instantaneous picture by the dry process.

The Chairman said if the pyroxyline were made with a weak acid, at a high temperature, dissolved in five parts of alcohol and three of ether, cadmium could be employed as an iodiser without any fear of the collodion becoming gelatinised.

Mr. Simpson observed that, in the last edition of his book, Mr. Hardwich mentioned a soluble cotton for making an alcoholic collodion that would bear iodising with cadmium, and would coat large plates without any danger of gelatinisation. With regard to the excessive use of bromide referred to by Mr. Hannaford, he might mention that he had received a letter that week from Major Russell regarding the tannin process. He therein stated that he had used two grains of bromide and three of iodide, which he found with the tannin process yielded very intense plates. The excess of bromide gave great detail with rapidity, and the tannin gave vigour to the picture.

Mr. Blanchard said his reason for using so large an amount of bromide was to obtain half-tones, which in a very short exposure could not be got with a small quantity. In reference to Mr. Hannaford's statement that

iodide of potassium would remove any excess of intensity, he might say that the application of chloride of mercury would have exactly the same result. In drying those pictures which had been intensified with mercury by heat they turned a bright red colour, which, however, faded away on cooling, leaving an orange shade. In answer to Mr. Hannaford he stated that the collodion he used was sold to him as containing equal proportions of alcohol ·805, and ether ·750.

The Chairman announced that at their next meeting their Secretary, Mr. Wall, would read a paper *On Sharpness: What is it?* The third report of the Experimental Committee on the dry process would also be laid before them.

Mr. Wall (the Secretary) said it had been determined on a previous occasion by the managing committee that their next anniversary meeting should be celebrated by a *soirée*, as the last had been. At their next meeting he should have something more definite to announce on the subject.

The proceedings then terminated with a vote of thanks to the Chairman.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Monday evening, the 18th ult., at eight o'clock, at the Golf Club House, Blackheath Hill,—Charles Heisch, Esq., President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Vernon Heath proceeded to read a paper *On Manipulating Wet Collodion Plates in the Field.* [See page 124.]

When Mr. Heath had concluded the reading of his paper,

The Chairman said he was sure they must all have listened with great interest to Mr. Heath's paper: there were many points of great practical value in it. The method of developing was more like that ordinarily employed with a dry than a wet plate. The good effect of using a weak developer he could quite confirm, and he had no doubt the plan of pouring water on the plate to begin with would equalise its action over all the plate. He was surprised, however, to hear of the possibility of drying the plates (mentioned by Mr. Heath as his practice if he injured the edge of the film) before fixing, as he had always found any attempt to wet a plate after it had been dried cracked the film.

Mr. Heath said that if the edges and injured parts were varnished as he had stated he did not find this to be the case.

The Chairman said something might be due to the nature of the collodion. If it were at all contractile it would of course be more liable to crack. Some collodion would crack away from the edges almost in the act of drying.

Mr. Heath said a very good plan to prevent this was to free the collodion from the ground edge of the plate all round, so that it could contract evenly. This was best done by drawing a damp cloth all round the edge of the plate when all but dry; it also made the negatives look neat.

The Chairman remarked that Mr. Spiller had mentioned to him that he had some unvarnished negatives the film of which had suddenly cracked all over after being kept some months.

Mr. Heath said he had seen some cracked after varnishing but not before: he had never had a negative of his own crack either before or after varnishing.

Mr. Williams, after remarking the beautiful character of Mr. Heath's pictures, and the perfect rendering of the grass, &c., in the foreground, as contrasted with the black grass so often seen, mentioned that he had employed a photographer to copy some buildings for him, who, after insisting on having a scaffold erected to about one-half the height of the building as the only chance of getting upright lines, had produced pictures with black grass foreground and white roofs to the houses.

Mr. Heath said that, with an ordinary landscape lens, it might be necessary to work from a raised platform; but the new forms of lens—orthographic, orthoscopic, or triplet—were especially made to avoid any such necessity.

The Chairman asked what distance they were working from the building?

Mr. Williams said about 300 yards, the building being about forty feet high.

The Chairman observed that in that case any landscape lens ought to do quite well from the ground, if there were no intervening objects, by very slightly raising the shifting front of the camera.

Mr. Heath, in answer to Mr. Glaisher, said he always used hypo. for fixing in the field; but he had been using cyanide lately, with iron developers.

The Chairman thought that the negatives developed with iron stood fixing with cyanide better than those developed with pyrogallic acid, which were apt to lose some of the delicate half-tone.

Mr. Heath said he had been making some experiments lately with different collodions for the purpose of ascertaining which gave the best half-tones. He found a collodion made by Mr. Thomas, iodised with magnesium, very good when developed with iron. There was a peculiarity of half-tone about it that they did not get from the generality of collodions.

The Chairman thought this effect was owing a great deal more to the fact that the collodion in question contained a large quantity of bromide than to its being iodised with a magnesium salt. He then asked if Mr. Heath's experience confirmed what had been stated by some as to the great keeping qualities of collodion iodised with magnesium salts?

Mr. Heath said it kept pretty well, but not like that iodised with cadmium. After five or six weeks it had diminished in sensibility. All the pictures they had seen were taken on collodion iodised two or three days before using.

The Chairman said his own experience was that magnesium collodion did not keep any better than other collodions containing an equal quantity of bromide: collodion prepared with ammonium salts could be used very well after two months or more if it contained much bromide.

Mr. Heath then presented the Society with a portrait of the President taken on the collodion in question.

It was proposed by Mr. Glaisher, seconded by Mr. Harding, and carried unanimously, that the best thanks of the Society be given to Mr. Heath for his remarks and for the portrait; and after some further conversation the meeting adjourned.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The monthly meeting of this Society was held in George Street Hall, on the evening of the 12th ultimo. The chair was occupied by T. B. Johnstone, Esq.

A paper *On Photographic Printing*, by Mr. Maxwell Lyte, was read by the Hon. Secretary. [See page 120.]

When the reading of the paper had been concluded,

Mr. Orange said that he was not sure whether Mr. Lyte had recommended the skies to be stopped out by painting the negative with bichromate of potash, or by pasting paper stained with that substance over it; but, if he meant the latter, he (Mr. Orange) had used it many years ago, hence there was no novelty in it. Painting the skies with bichromate he had never found to succeed properly; for, when the negative was varnished with Sœhnée varnish, which he used in preference to all others, he found there was a difficulty in getting the gum in which it was mixed to adhere to the varnished plates, besides there was a great tendency to crack and split off. Were it not for this, it would be a very good and useful substance for stopping the skies.

Mr. J. T. Taylor said that Mr. Orange would experience no annoyance in future from those causes provided he would add to the mixture of bichromate and gum water a very small quantity of ox gall and a simple syrup of sugar and water. The ox gall caused the gum to adhere to the picture, no matter how it was varnished, while the sugar effectually prevented cracking of the gum film. He had often thus prepared magic lantern slides, which had been exposed to a very high temperature without any appearance of cracking.

Mr. Tunny said that a very excellent way for stopping out a sky was by smoking over the plain side of the glass with the smoke from a candle, and then varnishing it. By that means the effect of clouds might be imitated very successfully.

A paper, entitled *An Appeal to Practical Photographers*, by Mr. A. H. Wall, was then read. A large portion of Mr. Wall's paper appeared in our last number: it is concluded in the present number. [See page 126.]

After the reading of the paper,

Mr. George Harvey, R.S.A., said that, although he could not assent to all that the paper contained, yet, as a whole, it was a step in the right direction. Photographers could not, he said, accommodate a scene before them in any way, so as to make a complete whole. Photographs appeared to him like bits of pictures: they had not the look of a complete or well-arranged picture. One of those to which a prize had been given in the present Exhibition was very beautiful in parts, but it wanted the unity that the mind of an artist would have given it. Actuality did not always give the best conception of truth. A topographer would fail to give such an accurate idea of Loch Katrine as Sir Walter Scott did. He thought he saw how far photography was likely to go; but, after what it had already achieved, he would be chary in prophesying anything. Photography did not give proper perspective. His friend, Mr. Kenneth Macleay, who was a photographer as well as an artist, had informed him that in painting a photograph he always found it necessary to make the eyes somewhat larger then they were represented in the photograph, and it was notorious that the hands, which were usually a little nearer the camera than the face, were rendered disproportionately large.

The Chairman said that subject had at their last meeting been treated by Sir David Brewster, who proposed to remedy it by the use of small lenses in the camera.

Mr. Harvey said that this would not be affected whatever by the size of lens: whatever that were the distortion would always remain.

Mr. Taylor said that the enlarged hands and nose in a photograph arose from the perspective being too violent, and were the camera removed to a greater distance from the sitter, this fault would be cured.

Mr. Tunny observed that notwithstanding the bad taste displayed in taking a portrait under such circumstances as allowed the hands to appear larger than they really were, it proved that instead of the perspective of photography being incorrect, it was *quite* correct—indeed it could not be otherwise: the nearer any object was brought to the point of view the larger the angle under which it was seen.

After the usual vote of thanks the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The first ordinary meeting of the above Society took place in the Library, Queen Street Hall, on Wednesday, the 20th ult.

The meeting was graced by the presence of several ladies. Among the gentlemen present were the following:—Bailies Blackadder and Auchie; the Lord Dean of Guild; Mr. James Falshaw; Dr. Moir; Dr. Easton; Mr. David M'Gibbon; Mr. Andrew Mure, advocate; Mr. Thomas Knox; Mr. John French, W.S.; Mr. Hugh Watt, S.S.C.; Mr. George Rowe; Mr. Robert Paterson, architect; Mr. Adam Walker; Mr. John Galletly, S.S.C.; Mr. P. L. Cattenach, S.S.C.

Around the walls of the room were hung upwards of 700 very choice specimens of photographic skill. Among the various artists whose pictures adorned the rooms were the names of Fenton, Bedford, Mudd, Horatio Ross, Tunny, A. Y. Herries, Piper, Rodger, Ramage, Silvy, Bisson, &c., &c. There was also a fine selection of pictures from the Exhibition of the Architectural Photographic Association, now open at the rooms of the Architectural Institute, George Street. Mr. Ramage exhibited several excellent photo-lithographs, which were much admired. Stereoscopes, binocular pictures, &c., were spread over the table in great abundance.

After a considerable time had been devoted by the company to the inspection of the photographic treasures provided by the Committee,

The minutes of the previous preliminary meeting were read by the Secretary, and approved. Four new members were admitted.

Mr. J. D. Marwick, the President, then delivered the following

Opening Address.

I cannot assume the position of President of this Society without explaining that the office has been imposed upon me, not only without my consent, but contrary to my expressed wishes, justified as I conceived these to have been, not only upon grounds of a personal nature, but likely to affect to some extent the prosperity of this infant Association. While I make this explanation, however, as an act of simple justice to myself, I should ill requite the compliment implied in my election did I not now endeavour to the best of my ability to promote the interests of the Society, and to further the objects which it is intended to secure.

You must not expect from me any contribution to the general stock of your knowledge on the subject of photography. Once, and for all, I have to disclaim everything but the crudest acquaintance with the optical or chemical branches of the science. My experience is simply that of one who, having got certain formulæ, has tried with very varying and uncertain success to produce certain results, and who, in the course of his practice, has felt the want (which this Society will, I have no doubt, supply) of ready access to photographers, whose greater knowledge and experience might resolve difficulties, and account for failures which beset the first steps, and almost crush the aspirations, of every beginner in the art. I shall not venture, therefore, in these introductory remarks, upon anything of a scientific or *quasi* scientific character. On subsequent occasions we shall have papers from members well qualified to speak on the various branches of photography and collateral science, illustrated by interesting and instructive experiments, which, explained freely in subsequent conversation, will enlarge our acquaintance with, and increase our love for, the practice of the beautiful art which we meet to cultivate. My object at present is altogether different. I desire to offer one or two hasty practical suggestions as to the spirit in which this Association should be managed and its objects pursued, and as to the means by which it may be made best to maintain its vitality—sustaining the interest, and if possible, the enthusiasm of its members.

Let us first, however, ascertain clearly and definitely what it is that the Society aims at accomplishing. It is instituted, say our laws, for "the mutual improvement of the members in the theory and practice of photography." Now, I wish, at the very outset of our career as a Society, to repeat, as its head, and as the exponent of its feeling on the matter, that nothing is further from our thought and desire than to establish what can be regarded, even in the humblest way, as a rival to the Photographic Society of Scotland. To that institution, with which several of our members are already connected, we wish to stand in the relation in which the school stands to the university. We desiderate opportunities for more free and frequent and less formal meeting than is afforded by the larger Society. The less experienced amateur may come here and state his difficulties or ask advice, and a more advanced member will give him such information and assistance as will save him many experiments and much vexation. More experienced members desiring to prosecute certain experiments will concentrate their investigation, compare the results, and in the interchange of friendly communication will help each other and advance their common object. If it be resolved to procure photographic views of interesting scenes or objects, such as, for example, the Abbey of Melrose, Linlithgow Palace, Tantallan Castle, or some of those interesting relics of former ages with which our own city and neighbourhood still abound, the members whose skill and practice recommend them best for the work may here be selected, and by a judicious and artistic application of their efforts a series of beautiful views may be obtained to enrich the portfolio of the Society, or the collections of individual members. Or it may be deemed expedient to relieve the more purely scientific nature of our work by discursions into fields of personal observation; and if so, the member who has spent his holidays amid some of the lovelier or grander aspects of nature may, by means of the stereoscope or the magic lantern, reproduce before us scenes which have most impressed himself by their own intrinsic beauty or magnificence, or on account of the associations which hang around them. Thus in an almost infinite variety of ways this Society may conduce to our improvement in the art of photography and at the same time subserve important ends of innocent and healthful amusement and instruction. Obviously we have facilities of that kind through our small Association which are not, and cannot very well in the nature of things be, available in the larger and more formal and stately Photographic Society of Scotland. As evidently, at the same time, are our Society and every similar association in Scotland fitted to minister to the general cultivation and progress of the art of which that institution may be regarded as the national representative. Our relation to it, then, is that of co-operation, not of rivalry.

Such being our object, I proceed to notice one or two of the means by which I apprehend it may best be attained.

First and prominently, I would observe, must be our determination to keep the society *select*. I don't consider it desirable, in any sense, that we should be a large society. Many of the objects which we propose could not well be gained were our meetings very numerously attended. An average attendance of thirty or forty members would meet my views, as being sufficient to give those who had papers to read an inducement to prepare them carefully; and, at the same time, be not too numerous to interfere with free colloquial discussion. To secure such an average attendance, however, I believe, judging from my experience of other societies, we should not shrink from enrolling eighty or even a hundred members. With an ordinary roll of that number we should secure variety of subject and of treatment, and at the same time maintain our exchequer in a satisfactory state. On this subject, however, there will doubtless be variety of opinion; but I trust there will be no difference in our estimate of the paramount importance of most rigorously excluding everything which can lower the tone of the society or detract from the cordial feeling which should subsist among its members. I do not at all desiderate the application of any educational standard in the admission of members. Still less would I insist on an equality of social position or photographic attainment. I can conceive most valuable members whose educational position might be far below that of others, who might still meet with them on a common platform in the Society, and their intercourse be mutually advantageous; and I believe we already have members whose attainments as photographers are scarcely to be mentioned, yet whose acquaintance with other arts—whose cultured taste and general intelligence—will contribute to the good of the Society, and more than compensate for the benefits which they expect to receive from it. I would desire to see this Association a small republic, as comprehensive in spirit and constitution as the outer republic of letters and art and science. It is the tritest of all trite observations, that men great in science, literature, and art—apostles of great thoughts and lords of the great heart—have sprung from the very humblest ranks, indiscriminately from the workshop and the mine, from the blacksmith's smithy and the cobbler's stool; and we will scarcely dream of making conventional distinctions of outward circumstances any ground of distinction here. "The facts of nature are open to the peasant and mechanic as to the philosopher." By nature they are alike capable of using these facts, and remembering that even in the lowliest calling the true worker may win the very loftiest results, we will receive with open arms any one, no matter what his calling or circumstances, whose knowledge of the art, whose cultivated taste, or whose manipulative skill is likely to contribute to the sum total of our attainments as a Society. Most carefully, however, should we guard against the admission among us of any element of discordance in the person of a captious, froward, troublesome member. One dead fly spoils the whole pot of ointment, however precious; and one opinionative, brawling, rude, or vulgar member will poison the comfort of all, and endanger the very existence of the Society. While, then, it has been wisely arranged that three votes shall exclude an applicant for admission, it is earnestly to be hoped that every member will be most careful not to recommend any person of whose eligibility he is not perfectly assured.

Selectness in the sense thus described being secured, it is most desirable to foster an *esprit de corps*. Each member must hold himself bound, according to the measure of his ability and opportunity, to promote the common object. Each must recognise the duty to aid and encourage his fellow as he would himself be aided and encouraged. The scientific knowledge, the taste, the manipulative skill, which the most experienced photographer of our society possesses, must be a fund from which the merest tyro may draw and come again. For all objects connected with our common pursuit we must be bound together in a philosophic bond like that of freemasonry, in which jealousy, envy, and all uncharitableness shall have no part. If this be realised, the business of the Society will be pleasant as well as profitable.

Assuming the existence of such a spirit, there are various ways in which the objects of the Society might be sought to be carried out, and a pleasing variety given to its pursuits. For instance, after the attainments of the members have been so far ascertained as to admit of classification, excursions might be planned during the summer months, in which members in the same class might co-operate in experimenting with wet collodion plates, with dry plates variously prepared, with waxed-paper, or, in short, with any of the other processes which the Society might be desirous to investigate or practise. The comparison, at the subsequent meetings, of the pictures obtained, and of the notes and observations made during these journeys, would be very interesting and instructive. I would, moreover, preserve a copy of each of the pictures so got, so far as they were worth preserving, as at once a pictorial record of the meetings, and, I hope, an evidence of progress.

I would also suggest, for the consideration of the society, whether arrangements might not be made either for an interchange of pictures among sections of the members, or for the distribution among all the members of a certain number of selected photographs. Probably both plans might be tried with good effect. Each member might be required to send in to the Council a print of one of his best negatives, and from these a certain number might be selected. The negatives of those selected might thereafter be got and put into the hands of a competent person, by whom prints might be taken for distribution among the whole members, either at the expense of the Society or at a low charge for each print. No member would grudge the use of his negative for such a purpose. Such an arrangement as this would be quite consistent with an interchange of photographs between members, under a classification recognised by the Society, or probably with greater safety under private arrangements which would not be open to objection as tending to split the Society into sections. These, however, are matters of detail; and I probably should not venture to do more than merely suggest the importance of seeking to make the interchange of pictures a means not only of securing for members a more extensive and varied collection than would otherwise be attainable, but of diffusing among all the members a mutual interest in each other's progress.

If, gentlemen, you accept of this outline as anything like an indication of our objects, it must be our own fault if we do not succeed in imparting to our meeting the greatest variety. A limitation of our business to the purely theoretical or manipulative branches of photography might pall; and, even could we be sure of obtaining sufficient contributions within these departments, the great majority of our members might, ere long, find the proceedings to be devoid of interest. But we may, I think, contrive to interweave or combine with the details of the art much that would interest and instruct and be ever fresh. As there is no one who may not press photography into his service, and make it applicable to the purposes of his special pursuit, so we may recruit our ranks from every profession and employment, and trust the camera to reproduce for us, in all its truthfulness, the various objects and forms by which each of our members may illustrate the subject on which he chooses to speak. To prove this, it is only necessary to advert to the numerous and important applications of the art.

[Mr. M. then adverted to the applicability of photography to the arts of painting and sculpture, and to the benefits which it conferred upon the artist by giving him studies of costume and form, enabling him to seize upon the characteristic features of a crowd, and to delineate the workings of passion. He referred, also, to the advantages which it offered to the sculptor and the architect, by placing within their reach the masterpieces of art; and to the manufacturer and the man of science, by enabling him to multiply their designs in endless variety, or to record, with unerring fidelity, the resemblances of Nature and the working of her laws.]

The simple statement of the infinitely varied applications of photography suggests the means by which the business of this Society may, in like manner, be infinitely diversified. It requires but that each member who has devoted himself to any one of the multifarious branches of science above alluded to, and who has applied this art to the objects of his observation, should come here with his illustrations, and, telling us of his *modus operandi*, should connect these details with the leading truths of his favourite study. In this way the knowledge of the artist, the architect, the sculptor, the botanist, the astronomer, or the geologist, might all be made available to interest, to amuse, and to instruct. In this way even the legendary lore and out-of-the-way facts of the antiquary might come home to the most work-day world utilitarian, and he would be surprised to find that in the rubbings from monumental brasses, the illuminations of some old monkish missal or mediæval charter, or in the mouldering remains of some feudal fastness or baronial residence, there was still a human interest, as on the suggestion of some humble photograph the long-departed years were brought back, and the all-but-forgotten dead were recalled from their obscurity to re-enact the ancient story which has given to them and all that appertained to them a long-lived interest.

These are all practical means by which variety may be given to the meetings of the Society; but, after all, the deepest sources of pleasure or of interest with which each one of us must look at his own pictures are those in which no one but himself can participate. Every one of them has a little history of its own; and as we look at it after a period of years we re-live the time at which it was taken. The scene comes up before us as fresh as ever, the friends who were with us, the conversation we had, the minutest

expression of lineament, and every little accessory of time and place and circumstance are reproduced, and you marvel to find that the long-obscured remembrance requires but to be breathed upon to come out sharp in every outline, and perfect in the minutest detail. It was but the other day that I turned over some blurred and defective prints of a few pictures, taken two years since, in the West, and there seated beside some boats drawn up on the beach, in the dress and attitude, and with the very smile he had, was the friend who, but a few months afterwards, passed away from all human friendships, and lives for us but in memory, and through the medium of this art. It is strange how such incidents move us. They suggest, moreover, what for all of us is a solemn consideration, that the tablets of our memory are sensitised surfaces, on which every experience is leaving its impression to be brought out some day. Not more surely does every beam of light and every breath of air which falls upon an object permanently affect it than does every incident in our lives, even the long-forgotten sorrow of childhood, leave its peculiar stamp and trace. It blends itself with the firmer texture of our youth and manhood, but it lives still, and may at any moment be reproduced, for aught we know. Lewis, in his *Studies on Animal Life*, tells us that if a wafer be laid on a surface of polished metal, which is then breathed upon, and if, when the moisture of the breath has evaporated, the wafer be shaken off, we shall find that the whole polished surface is not as it was before, although our senses can detect no difference; for if we breathe again upon it the surface will be moist everywhere except on the spot previously sheltered by the wafer, which will now appear as a spectral image on the surface. Again and again we breathe, and the moisture evaporates, but still the spectral wafer reappears. The experiment succeeds after a lapse of many months, if the metal be carefully put aside where its surface cannot be disturbed. If a sheet of paper, on which a key has been laid, be exposed for some minutes to the sunshine, and then instantaneously viewed in the dark, the key being removed, a fading spectre of the key will be visible. Let the paper be put aside for many months, where nothing can disturb it, and then, in darkness, be laid on a plate of hot metal, the spectre of the key will reappear. So is it with ourselves; and even as under intense cerebral excitement illiterate persons have been known to utter the words of an unknown language which they had long before heard without comprehending—words forgotten for years, and the traces of which, in ordinary conditions, were so faint as to be invisible—so may acts, scenes, and incidents in our own lives, which have long since faded from our recollections, again start forward into prominence under other conditions of existence, just as the application of heat forces into reappearance the spectral image of the key. Verily our own consciousness may at any time supersede the office of the recording angel!

A few words more as to the value of photography as a diversion from the cares, anxieties, and distractions of business—as a means of educating the taste for the beautiful, and so of multiplying the avenues of pleasure—and I have done.

Most of us, I dare say, are engaged in the active business, and have to bear our part in the struggles and contests of common life. We are scarcely able to emancipate ourselves from the passions, prejudices and influences of party and sect, and the more we are thrown into the toil and trouble, and subjected to the pressing demands of business, the more hardened we are apt to become to the gentle and refining influences of nature, or of the beautiful in art—the more insensible to the higher and nobler aspirations of our being. Now everything which comes in here to divert us from the private interests and political questions which so deeply divide men—to take us out of the region of party strifes—and to open our hearts to kindly, genial, elevating influences—to improve our perceptions of the beautiful wherever that is to be found, and to refine our nobler sensibilities, is to be welcomed and embraced. I apprehend that the study of art does this—that it tends to the development of a part of our being which the ordinary pursuits of life leave dormant; and to that development everything which enables us to see beauty where we had previously overlooked it—everything which raises the standard of that ideal beauty which all men cherish to some extent—ministers to our true culture, and gives to our being greater completeness and higher dignity. I believe that the practice of photography is a most powerful means of training the outer and inner eyes for the perception of beauty. Beauty surrounds us. It environs us on every side. It is an all-pervading presence. But men may live in the midst of it, and still not see it. To such men nature is a great literality—a stone is but a stone, an insect but a creeping thing. For them there is no charm in the turn of a leaf—in the delicate interlacing of light and shadow—in the outline of a mountain range—or in the shaping of a summer cloud reflected in the bosom of one of our own mountain lakes. And yet within these men may slumber a God-given capacity to perceive beauty in everything. It may need but to be awakened and to be cultivated to qualify them for recognising an effloresence of infinite beauty in the flowers of spring, in the budding leaflet and the blade of grass, as well as in the ocean, the mountains, the clouds, the heavens, the stars, the rising and setting sun. The man who has this capacity cultivated but in very moderate measure has an unfailing delight in the contemplation of nature. He is, so far, independent of society and books; and all of us must have seen such an one luxuriate in scenes and circumstances which yielded no delight to other men less receptive of beauty, because, I do believe, they had never cultivated their receptivity by the practice of photography or drawing, or painting, or any of the other educational processes, by which men have their spiritual as well as their physical vision improved, and learn where to look for, and in what to perceive, beauty. There is profound truth, as well as great charm of expression, in the following extract from *Blackwood*, with which I shall conclude:—"We all of us, in a great measure, create our own happiness, which is not half so much dependent upon scenes and circumstances as most people are apt to imagine. And so it is with beauty. Nature does little more than furnish us with materials of both, leaving us to work them out for ourselves. 'Stars, and flowers, and hills, and woods, and streams, are letters, and words, and voices, vehicles, and missionaries;' but they need to be interpreted in the right spirit. We must read and listen for them, and endeavour to understand and profit by them. And when we look around us upon earth, we must not forget to look upward to heaven. 'Those who can see God in everything,' writes a popular author, 'are sure to see good in everything.' We may add, with truth, that they are also sure to see beauty in everything and everywhere. When we are at peace with ourselves and the world, it is as though we gazed upon outward things through a golden-tinted glass, and saw a glory resting upon them all. We know that it cannot be long thus: sin and sorrow and blinding tears will dim the mirror of our inmost thoughts; but we must pray, and look again, and by-and-by the cloud will pass away. There is beauty everywhere, but it requires to be sought, and the seeker after it is sure to find it. It may be in some out-of-the-way place, where no one else would think of looking. Beauty is a fairy; sometimes she hides herself in a buttercup, or under a leaf, or creeps into the old ivy, and plays hide-and-seek with the sunbeams, or haunts some ruined spot, or laughs out of a bright young fern. Sometimes she takes the form of a white cloud, and goes dancing over the green fields or the deep blue sea, when her misty form, marked out in a momentary darkness, looks like the passing shadow of an angel's wing. Beauty is a coquette, and weaves herself a robe of various hues, according to the season; and it is hard to say which is the most becoming of all the attitudes and shades she is wont to assume, as she traces her lineaments on the broad canvas of nature."

Gentlemen, we shall not find that our time has been either unpleasantly or unprofitably occupied if by means of our meetings here we have our susceptibility to beauty increased; if we are enabled to discover the fairy and coquette in places where otherwise we should not have looked for her, or to detect her under disguises which, but for our experience as photographers, we should not have been able to penetrate.

At the conclusion of the President's address,

The Lord Dean of Guild moved a cordial vote of thanks to Mr. Marwick for his admirable address, adding, that although he was the youngest and most inexperienced member of the Society, he yet trusted, under its fostering care, to attain to at least an average acquaintance with the beautiful art of photography.

Bailie Blackadder expressed himself highly pleased at being present. He, like the Dean of Guild, was only a photographer in embyro; but from his connexion with that Society, which gave such strong evidences of vitality, he hoped, ere long, to be more intimately acquainted with the art. If he could not expect to practise it himself, he might at least derive, as he had done that evening, pleasure and instruction from the skilful labours of others, and be enabled to appreciate intelligently such beautiful works as adorned the walls of their place of meeting, in which, as was most befitting, literature and art were wedded together.

After a few remarks from Mr. C. Falshaw and Mr. Nicol,

The Secretary announced that a paper *On the Fothergill Process*, illustrated by experiments, would be read at the next meeting by Mr. Burns.

The meeting then adjourned.

LIVERPOOL PHOTOGRAPHIC CLUB.

On Thursday, the 7th instant, the members of the above Club met at the house of Dr. Cauty. The meeting was one of considerable interest.

Among the specimens exhibited by the host were a number of interesting stereographs by the dry processes, a quantity of brilliant proofs from Mr. Bedford's best subjects, and a stereoscopic camera, of excellent design and workmanship, with transfer-box, of perfect construction, by Messrs. Newton, of Liverpool.

Mr. W. G. Helsby exhibited a number of most interesting photographs of South American scenery, produced by his brother on a yacht voyage along the West Coast. Among them may be specially noticed a *View of Valparaiso*, taking in the Bay and shipping at anchor; *The ex-Governor's House* (Juan Fernandez), a mountain scene of wild grandeur; *Robinson Crusoe's Cave;* and several picturesque views of the silver mines in Chili. The whole, comprising upwards of twenty subjects, are handsomely bound in the form of an album, for presentation to the friends of the spirited proprietor of the yacht. The work reflects great credit on the photographers, Messrs. Helsby and Co., Valparaiso.

The conversation having been directed to the cause of the cracking of the films of varnished collodion negatives, a member suggested a plan by which the evil could be entirely obviated. After thoroughly washing the fixed negative, and draining for a minute, he pours over a solution of gum arabic, draining, drying, and varnishing in the usual manner.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The usual meeting of this Society was held on the 13th ult. The business was confined to arranging for the election of officers at the next, which will be the Annual Meeting, and some alteration in the rules, not of any particular interest out of the Society.

ON THE INJURIOUS INFLUENCE OF DRYING POSITIVE PAPER.

By T. Mende.

Photographers are but too well aware that sensitised positive paper becomes rapidly discoloured, especially in a warm moist atmosphere, even in the dark. The loss and inconvenience caused by this decomposition led several experimentalists to trace out the source of it, and it was found to consist in the presence of moisture, and that if the sensitised paper could be kept in a perfectly dry atmosphere it would remain a considerable length of time unchanged. With this view boxes were contrived in which the air should be kept dry by the presence of chloride of calcium. These answer exceedingly well for the purpose in view; but, in removing the evil, it is found that sensitised paper, after it has been kept three days or more in the drying box, gives but very feeble pictures, resembling those taken on paper from which the free nitrate has been removed by washing. The cause of this is that a certain per centage of water is necessary to effect the decomposition of the chloride of silver in the presence of light; and if it be absent the chemical changes concurring in the production of a strong positive print are wanting.

If the hypothesis be true, that the image is formed of successive layers of chloride of silver at the expense of the free nitrate, excited by the reducing powers of light, we have an explanation of the reason why highly dried sensitive paper fails to give good proofs.

It is easy to overcome this difficulty without abandoning the use of the highly useful preservative cases, simply by damping the sensitised paper between leaves of moistened blotting paper previous to putting it into the printing frame. The paper immediately absorbs as much moisture as is necessary to cause the nitrate of silver to act during printing.—*Photographisches Archiv.*

Obituary.—Suddenly, at his residence, the Estanci de los Sajoues, Buenos Ayres, James Peter Sheridan, Esq., formerly a member of the Liverpool Photographic Society, and an ardent photographer in the waxed-paper process.

Correspondence.

MOUNTING PRINTS.—KEEPING SENSITISED PAPER.

To the EDITOR.

SIR,—Will you be so kind as to tell me, through the medium of your Journal, how to prevent the prints from curling the cardboard after mounting? I dislike the India-rubber solution, on account of the disagreeable smell it introduces to the print. Also, which you think is the best preservative for sensitised paper—chloride of calcium or lime? I am, yours, &c., AN AMATEUR.

London, March 26, 1861.

[1. You must damp the cardboard on which you mount your prints, if you employ any adhesive material soluble in water. The plan lately recommended by Mr. Stuart, of Glasgow, appears to us a very good one, viz., apply your adhesive material to the back of your proof, and let it dry; then damp the cardboard; place the prepared print in its proper place, and pass the two between rollers, or under a lithographic press. 2. We think that Mr. Spiller's box with common quick lime most advantageous to use at home; Marion's case with chloride of calcium if for a journey.—ED.]

LOOK AFTER YOUR CAMERAS.

To the EDITOR.

SIR,—Having been a sufferer by the inroads of a very small, though by no means despicable, enemy, I am desirous of warning my brother photographers against it, and take advantage of your kindness to do so through the medium of your Journal.

I stowed away my cameras very safely, as I thought, in a dry attic for the winter; but, upon taking them out the other day, in order to commence operations for the summer, I found the bottom of one of them perforated by small round holes, made by the ordinary wood-worm, and I shall be obliged to have a new bottom put to the camera.

Perhaps you could kindly tell me of some method of keeping the worms away from the wood; if so, you will confer a great obligation upon yours, &c., VERMIS.

Liverpool, 22nd March, 1861.

[We scarcely know to what animal you refer by the term *wood-worm*. As a rule, wood is perforated by the *larvæ* of certain beetles, and sometimes by white ants in hot climates. We imagine that good French polish would be the best protection.—ED.]

SENSITIVENESS OF THE RESIN PROCESS.

To the EDITOR.

SIR,—The great drawback to the mode of preserving dried plates, by putting resin into the collodion, has been the dread of impaired sensibility after prolonged keeping: two weeks have been considered the utmost that might be depended upon.

In a former communication I mentioned I had put one by to test it, and am now able to state the particulars.

On the 16th of October, last year, I prepared a plate 6½ inches by 8½, using no other precaution than what might be called excessive washing. After resting it edgewise upon two bricks, in a dark box, it has remained so until Saturday, the 9th of March, this year. The morning was fine, and I exposed it with a plate prepared two days before, viz., 7th March. The exposure was just the same in each—*exactly two minutes*—and each developed with the same chemicals: the only difference I can detect (excepting a few holes in the film from over-iodised and at the time fresh collodion) is that the longest kept was the more sensitive plate of the two.—I am, yours, &c., C. COREY.

THE PHOTOGRAPHIC EXHIBITION OF 1862.—A HINT.

To the EDITOR.

SIR,—A very general opinion seems to exist among photographers that this year's Exhibition is not equal to that of last; and even in your own kindly critiques you admit that, at all events, it shows no degree of progress.

Now, although, no doubt, last season was about the worst for photographic purposes we have had for years, still, I think, if a spirit of emulation had been infused amongst us, a superior display of manipulative as well as artistic skill would have resulted, even in spite of the weather.

But, say you, how is this friendly rivalry to be "developed?" Very easily, in my opinion. Let the Photographic Society give forth, *at once*, that they will arrange the pictures at their next Exhibition in a different manner to that adopted heretofore, and instead of hanging them on the walls "promiscusly," as Mrs. Gamp would say, they will place the contributions of the members of each Society in groups or divisions, thereby enabling the public to form a judgment, by comparison, on the skill and artistic qualities of their respective members.

This plan would arouse us all to action. Each Society, as represented by its individual members, would make the most strenuous exertions to produce fine pictures, and carry off the palm of superiority; and I am confident in the prediction, that the stimulus thus given would result in a Photographic Exhibition which, for novelty, extent, beauty, and general excellence, has never been seen before in this country.

Leaving the better advocacy of this idea in your own able hands, should you think well of it,—I am, yours, &c., A.

P.S.—Of course the proposed arrangement would not necessarily exclude the productions of non-society members: a division could easily be arranged for them, as well as for foreign contributors.

PHOTOGRAPHS IN NATURAL COLOURS.

[A FRIEND at Liverpool lately received the following amusing note:]

DEAR ——, You will remember in THE BRITISH JOURNAL OF PHOTOGRAPHY how a certain Mr. J. F., of Congleton—"a neglected genius"—had made the grand discovery of applying colour to photographic pictures, per old Sol.

Arriving here, I asked my principal customer his whereabouts, and was told (in a facetious tone) I would find it next door to a little beer shop, with the information on a dirty board, that "*LODgINS* for TRA*V*ILerS" could be had; but that if a spot in the country could be named where art was in its infancy, *that* would be the place.

Arriving there, I could not help laughing at the plain and coloured specimens, which reminded me of those (only a shade worse) outside the yellow caravan in Scotland Road. Thinking, however, the "*gems*" might be hid from mortal eye, inside, I walked in and made the acquaintance of no less a personage than J. F. himself, who informed me "*them* wur 1s. 6d. a-piece, and *thur* wur hafe-a-guinea," and that he wur the only man in England who knew "how to colour them wi't sun." I said I would look at them; but learned "t'price wur a thāāsand pāānds," which, you may conceive, I did not feel inclined to pull out of my pocket. Asking the *difference* betwixt the "eighteenpenny" and "hafe-guinea" samples, I learned the latter "wur moor lāāf-like, and theer wur summat abāāt it he never saw abāāt any other." "T'Manchister folk did bigger; but take microscope and yaw could see three colours it eye. T'Lundon foaks had sent for samples; but he knew nobbut but to critisāāze it: and if he showed it, other foak could finnd it āāt, soa he'd be paid for it." I therefore left as wise as I went, with the impression that Mr. J. F.'s discovery and secret could be embodied in a single word, viz.—H, U, M, B, U, G.

Congleton, March 13*th*, 1861. Yours sincerely, W. G.

ANSWERS TO CORRESPONDENTS.

PETER.—We shall have a paper on the subject shortly.

R. G.—Will propose you as a candidate for election, as requested.

F. P. M.—Received with thanks. Very good, but rather too large.

R. L. M.—Received. Will endeavour to reply to all your queries shortly.

DOUBTFUL.—A few drops; the exact quantity is quite immaterial—say five to fifteen.

A. W. K.—Received too late for reply in our last. No. 2 is the retail, No. 1 the wholesale agent.

T. M.—Fill up the deficiency with a slightly stronger solution—say thirty-five or forty grains to the ounce of water.

S. W.—A little more time on the exciting bath, or increased strength of the latter, will most likely remedy the annoyance complained of.

R. (Fermoy).—Too much acetic acid materially retards the development of an impression; but too much nitric acid will arrest it altogether: so you can take your choice.

J. B. L.—We should not advise a trial of waxed-paper for negatives, if, as you state, you mean to practise upon dry glass plates eventually: the manipulation of the one will not be much assisted by familiarity with the other.

AMATEUR (Leicester).—We intend giving the details for which you ask in our next. We do not print letters for the benefit of the senders, but in order that our replies may be useful also to others of our readers. Yours will therefore appear in our next.

VIATOR.—See our remarks upon albumenised plates for negatives. If you want them only for personal use, try Major Russell's tannin process, which you will find in the last (sixth) edition of Hardwich's *Manual*.

THOS. SMALLWOOD.—Hyposulphite of soda is not so good for fixing positives on glass as cyanide of potassium, because it degrades the tone of the high lights more than the latter, and in glass positives they are never too brilliant.

J. MARTIN.—The "pistolgraph" (!) is intended for taking instantaneous pictures only, of about *one inch square* in size, for which purpose it is perfectly efficient; but for larger sizes it is not applicable: consequently it is simply a question of size as to whether it will answer your purpose or not.

QUASIMODO.—It is not unlike, certainly! The dwarfish appearance arises from your having your camera too high with respect to your sitter; the lower extremities become thereby foreshortened. If you cannot lower your camera, you must elevate your sitter by placing him, chair and all, on a sort of dais. Looking down upon a sitter will always impart an undignified appearance to your portraits.

CHAS. SUMPTER.—If you place the stop in contact with the view-lens you cure the distortion, it is true; but you introduce too great curvature of the field. It is chiefly in order to flatten the field that the diaphragm is placed at a distance from the lens, hence the larger diameter of the latter. If the two were in contact, there would be no need for the lens itself to be larger than the largest diaphragm.

QUIZ.—Lenses are to be obtained fit for the several purposes named—that is for stereographic portraits *and* landscapes combined in one instrument—either of Mr. Dallmeyer or Mr. Ross. The focus is, however, much longer than you name: it is perfect nonsense to reckon it from the back lens. We must refer you to trade lists and advertisements for prices. They are double combinations, and include a wide angle of picture.

AN AMATEUR.—Your note arrived so late that in order to give any reply in our last we were obliged to be content with a very partial examination of your specimen enclosed. We are not aware that we have mis-estimated the cause of your trouble, except, perhaps, as regards the density of your negative, which possibly may be sufficient; but we feel convinced that your exciting bath for the paper is too weak. The chief fault, however, lies in the toning bath, which, we have no doubt, has become inactive from precipitation of the gold. As before indicated, the latter should be mixed only just before using.

WILLIAM DANIELS.—Your stereograph is very fair in execution. The reason why one picture is rather lighter than the other is, that one has received, *in effect*, more exposure than the other, whether this be so actually or not. You do not state how it was taken; but, if with a bi-lens camera, *one lens* works quicker than the other. The same would apply whether a wet or dry collodion plate were used. Again, if wet collodion and a single-lens camera were employed, the picture that is exposed last should have *more* time allowed than the other, to produce an equal effect, as sensitiveness of the wet film is certainly deteriorated by the lapse of time.

ROBERT BURNHARD.—You have stopped the development of your plate before the intensity is sufficient: you must bear in mind that a negative looks more intense in the dark room than is really the case, and also that the fixing reduces it somewhat. Your collodion also is not good; there is evidently too much water in it, as indicated by the *crapy* lines. This last effect may sometimes be mitigated by letting the film set more than usual before immersing it in the nitrate of silver bath. It is not improbable that the addition of a little more iodising material may assist you; try one grain of iodide of cadmium to an ounce of the present iodised collodion. We do not like the alcoholic collodion, though we think it very likely to be preferable in hot climates—in fact, it stands to reason that it should be so.

PRACTICAL INSTRUCTIONS ON COLOURING PHOTOGRAPHS.—We are reluctantly compelled to omit Mr. Wall's Paper in the present number.

☞ The usual letter from our Paris Correspondent had not arrived up to the time of our going to press.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 140, Vol. VIII.—APRIL 15, 1861.

Halation.—At the last meeting of the Photographic Society (London), a paper by Mr. Marlow, of Birmingham, purporting to be on the subject of "Halation," was read by the Secretary. As will be perceived, on reference to our report of the meeting, it is very evident that the author of the paper has altogether mistaken the signification of the term—or we should perhaps more correctly say that he has misapplied it to another phenomenon. It is also not a little singular that a considerable amount of confusion has been caused by the classification under one head of several distinct objectionable phenomena arising from very different causes. The particular one to which Mr. Marlow's paper was devoted is a species of fogging, unfortunately but too familiar to those operators who have much to do in the delineation of interiors, especially where a southern window at the extremity of a long dark aisle has to form the principal centre of the subject; and the objectionable effect is heightened to a very offensive degree when operating at or about noon, when the direct solar rays fall upon the window. This effect has been attributed to "diffraction," or bending of the rays of light that pass in immediate contiguity by the edges of objects. But, without at present discussing that question, we may explain that the appearance presented is that of a haze or fogging of greater or less amount extending from the high lights *over a portion of the shadows or darker parts* of the picture. This, however, is *not* what is understood as "halation." Moreover, the effect produced is diametrically opposed to what occurs in the latter; for in this the outline is more or less obscured and degraded as regards sharpness and intensity, while in the case of real "halation" the sharpness of outline is materially increased so as to become very offensively hard and cutting. Where the outline of a landscape or architectural subject is in contact with that of a bright sky, when halation takes place it is produced by a very dense deposit of silver, commencing exactly at the junction of the sky with the darker part of the subject, and extends into the sky part of the picture, decreasing in intensity until it is lost in the general deposit of silver which represents the sky. The breadth of the said dense band varies with circumstances; but when present it always exists only in the lights, never over the dark parts. We may observe that we have never known the phenomenon of true halation to occur except when the sun is low down towards the horizon, and when at the same time the exciting bath has contained a large proportion of organic matter.

We will now address a few observations with reference to the subject really discussed in Mr. Marlow's paper—a species of fogging—and for which we are disposed to adopt a term suggested by Mr. Henry Bohn, who was present at the meeting, and which appears to be sufficiently descriptive and appropriate, namely, that of "nubation." Mr. Marlow attributes the effect of nubation to reflection from the under surface of the glass plate, and he was directed towards this conclusion from observing that the defect is always most noticeable at the back of the picture. It would be impossible, without more mature consideration and experiment, to decide upon the accuracy of this conjecture. There are several points of objection to this theory which might possibly be established; but we do not think that the specimens exhibited in illustration of the paper were by any means sufficiently satisfactory to form a basis upon which to found a theory. To begin with—they were, with one exception, produced by exposure to the direct light, under an opening in a piece of card, and not in the camera. Possibly the explanation proposed by Mr. Marlow for the effects thus produced may be tolerably correct in the main; but we question whether it at all holds good when a similar appearance arises in taking views of interiors. Again: the remedy proposed, that of coating the back of the plate with a film of black varnish, we consider to be quite out of the question in practice; and, even assuming the theory propounded to be correct, we believe that the placing of a piece of black cotton velvet or undressed black cloth in contact with the back of the plate while in the dark slide would be quite as effectual as using the black varnish, and far more practicable.

We consider that the subject of the paper upon which we have been commenting quite as worthy of investigation as that of halation, and the discussion of it may prove of much service by directing inquiry towards a solution of this cause of annoyance. Our objections to the proposed explanation are not made in a captious spirit, but simply for the purpose of endeavouring to aid in clearing up the mystery of its occurrence at certain times and not at others. With regard to the diagram which accompanies the paper, no notice is taken of the effects of refraction arising from the obliquity of the incident ray; but this may have been purposely omitted for simplification of the illustration. We cannot, however, omit drawing attention to the probability that, supposing any light to have passed through the collodion film, so as to suffer reflection at the second surface back again upon the film by its passage through the iodide of silver, especially when occurring within the camera, the actinic portion will have been effectually arrested by the said iodide—as will be very readily conceded by any one who has ever attempted to print from a negative from which any portion of the iodide of silver has not been dissolved out of the film.

In conclusion, we would remark that when the effect of "nubation" (as we propose to call it) happens in taking a negative of an interior, the window or opening in contiguity to which it occurs generally occupies a spot not far from the centre of the picture; and, in this case, the rays are incident with but very slight obliquity upon the plate—a condition of things most unfavourable to internal reflection: the greater the obliquity of incidence, up to a certain point, the more perfect the reflection (so that at an incidence of from 40° to 45° the reflection becomes total); and it is very rarely that the image of a window located upon the edge of the plate is defaced by this defect, while, supposing the theory adduced to be sound, it is precisely when so situated that the disfigurement ought to be at its maximum.

A Hint.—We think there is a good opportunity for the production of a popular stereoscopic slide by any photographer who will take the trouble of depicting the omnibuses now running on Mr. Train's new street railway from the Marble Arch, at Hyde Park, to Bayswater. A good "instantaneous" picture would, we fancy, be in great demand, especially amongst those of our provincial friends who have not yet had an opportunity of inspecting this novelty of the day.

Soiree.—On the 4th instant, a gathering of photographic celebrities took place in the Great Hall of King's College, London, on the occasion of a reception by the Lord Chief Baron, Sir Frederick Pollock, President of the Photographic Society. There was a very numerous attendance of both ladies and gentlemen. Many gentlemen of note in the scientific world were present as guests upon the occasion. Nearly the whole of the pictures from the Exhibition then just closed had been removed to King's College, which, together with some additional specimens (including some from Messrs. Rejlander and Prout, which were much admired), were tastefully arranged round the Hall, and displayed to much greater advantage than in the Pall Mall gallery. Specimens of apparatus, stereoscopes, microscopes, and some very brilliant chemicals, were arranged on the various tables, and excited much attention, very many of the ladies being particularly interested therein. In several instances we were asked by visitors whether it would be possible to obtain admission on the following morning, in order to go carefully over the collection of photographs—an evidence of the fact, that it is only necessary to bring the productions of our art under the cognisance of persons of taste and education, who have not hitherto had opportunities of viewing them under moderately favourable conditions, in order to extend the ranks of those who view our pursuit with feelings of interest, even if they do not take an active part in it. We must not omit to mention that amongst the adornments of the Hall upon the late festive occasion were a few specimens of sculpture, one of which in particular was very much admired, as well for its excellence of execution as for its conception. The subject to which we allude is entitled *Go to Sleep*, and is the representation of a sweet little girl, in a graceful attitude (a portrait, we were informed), attempting to hold a dog back in her arms, much as a nurse would hush a baby; while the dog, which is not apparently a consenting party to the arrangement, is struggling to assume a more ordinary position of canine dignity. It is only needful to mention the name of Mr. Durham, as the artist, to testify to the artistic value of the composition; and it will afford our readers satisfaction to learn that he is also an accomplished photographer.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XXI.

We are glad to find that Major Russell intends publishing a pamphlet containing a full and detailed account of his dry process with tannin as a preservative. For several weeks we had no opportunity of comparing notes with him as to the practical working of the new method; and hence we were pleased to meet him a few days since, and to find that he is still actively engaged in experimenting. More than a year ago we could not refrain from saying to a friend, that if the reward of discovery went by desert, and not by accident, Major Russell would undoubtedly obtain it—not only from his perseverance in examining the dry processes already known, but from the happy originality he displays in devising new ones.

Two or three points in the tannin process occur to us as needing remark. When we first tried this method, we were strongly reminded of the action of glycyrrhizine in the wet process, concerning which one of our best practical operators stated that in his opinion its especial characteristic was an increased density of the sky and of other parts of the image on which the light acts strongly. The tannin dry process in like manner gives an excellent redness and vigour to the high lights of the negative, but the half tones are more inclined to a metallic greyness. Supposing the actinic force of the light to fall below a certain point, the opacity of the deposit is, according to our experiments, less with tannin than with albumen: hence we anticipate that the collodio albumen method will still be found preferable for lenses of very long focus and small aperture, but that the tannin process will give a softer picture when short-focus lenses are used.

In explaining the action of the tannin we must not attempt to be too explicit, since there is evidently a something not clearly intelligible. The fact of tannic acid being a reducing agent has evidently to do with its property of accelerating development and imparting intensity; but, in addition to this, it seems to possess some other quality which renders it favourable for that purpose, since it produces a more marked effect than pyrogallic acid, which as a mere absorber of oxygen far surpasses it. In the wet process we observe the same thing; for the image developed by gallic acid is more chemically opaque than that of pyrogallic acid, although the former is the weaker reducing agent. It will probably not lead us far astray to view the matter in the following light:—when organic bodies reduce the salts of silver, there is, as a rule, a combination of organic matter of some kind with the product of the reduction. This combination is more marked in the case of albumen—a weak reducer—and less so in that of pyrogallic acid; hence the former (and bodies like the extractive matters which resemble it photographically) may be expected to give the greater intensity.

Major Russell, in using newly iodised collodion for the tannin process, finds it to produce a redder and more decided image than old iodised collodion; but our own experience has been invariably in the opposite direction. Both observations are doubtless correct, and the discrepancy may perhaps be reconciled by considering the mode of manufacture of the collodion and the length of keeping. After having been iodised for a certain time, a given collodion may be found more intense than at first. Allow a longer time to elapse and it may prove to be less intense. The same rule applies to the bath; and, although moderately old baths usually produce increased vigour of negative, baths of still greater age often lessen the vigour. In each case the changes are due partly to a transformation of organic matter, and partly to the presence of iodine or acid. It would be impossible to lay down any fixed rule, since the changes thus affecting density are themselves materially influenced by the nature of the pyroxyline and the purity of the ether in the collodion.

Some mention having been made of *fogging* in the tannin process we were anxious to inquire of Major Russell whether he had experienced this annoyance. His reply in the negative was confirmatory of our own results; for on no occasion have we had reason to complain of fogging, provided the collodion contained enough bromide. With a simply iodised collodion fogging and longitudinal streaks are sometimes apparent; hence we would suggest to those who make complaint, that if by admixture of various collodions the proportion of bromide has been too far reduced, more of that salt should be added.

Another matter which requires notice is the propriety of drying the film by artificial heat subsequent to the application of the tannin. It will be remembered by some that, in the early days of the Photographic Society, Sir William Newton advocated imperfect focussing of the picture as a remedy for that excessive sharpness which he considered to be offensive to the eye of an artist. In the tannin process we have invariably found that the pictures are slightly blurred if the plates be merely surface-dried, and that the negatives possess more of the albumen sharpness when the film is condensed and the last traces of moisture driven off by placing a warm iron in the box around the sides of which the plates are reared. It should be noted, however, that our experiments have mostly been made in the winter season, at a time when the atmosphere is very damp.

Mr. Fothergill, whose name is so well known to the photographic public, has taken up the tannin process, with a view of satisfying himself as to its capabilities. With two men so remarkable for candour and perseverance as Major Russell and Mr. Fothergill, the readers of this Journal may well be satisfied to leave the process, feeling sure that it will be worked out by little and little, and that they will eventually obtain a perfectly impartial statement of its value as a dry collodion method.

ON THE TESTING OF OLD COLLODION AND PRINTING BATHS.

By George Dawson, M.A.

[Read at a Meeting of the North London Photographic Association, March 29, 1861.]

In fulfilment of my promise to carry out an extended series of experiments—the results of some of which you already know—I have now the pleasure of laying before you a larger stock of facts,

om which I think we shall be able to deduce a considerable nount of useful information.

Through the kindness of Mr. Hughes and of some other friends I ave been favoured with many specimens of old printing and col- dion baths, all of which I have examined with great care on very point which I thought might be useful in the present quiry. But, in truth, the question, from causes to which I need ot particularly refer, has assumed a prominence and importance r beyond its merits.

Practically speaking, I can scarcely fancy a photographer of any tanding sitting down quietly every morning to ascertain how uch his baths may have lost in strength since yesterday. It annot be to acquire useful information, but to gratify an idle riosity; for he knows, or ought to know, the original strength of is solution—he knows that silver is abstracted each time he xcites a plate or paper, and experience soon teaches him to esti- ate this amount pretty nearly. In short, it is the usual rule, I elieve, not to cease using a bath so long as it continues to give ood results. There are cases when testing may be of use, but ey are exceptional, and not of frequent occurrence. Neverthe- ss, as the question has been raised—what is the best, quickest, nd most easily applied method of testing a negative or positive olution, so as that we may be able to tell within a grain or so the trength of the bath with which we are about to operate?—I shall ow contribute my mite towards its settlement.

Several plans have been proposed and instruments devised for is purpose, all possessing defects and advantages in a greater or ss degree, which I shall examine separately.

1. Specific Gravity Test.—Against this test it has been urged, ith great theoretical probability, that the accumulation of light atter in collodion baths and of heavy matter in printing baths enders its indications valueless. This objection is true to some xtent, but not nearly so far as is generally supposed. In proof f this I am able to bring forward some potent facts:—Out of fifteen ld printing baths sent to me from all parts of the country for analy- ical investigation, and varying in strength from 49 to 100 grs. itrate per fluid oz., all—with one remarkable exception, to be eferred to more particularly hereafter—showed by the sp. gr. ottle an amount of nitrate of silver exceeding what they really ontained only by from 1 to 5 grains. The exact average of excess vas 3·45 grains. The nitrate of soda and ammonia varied from 75 to 6·25 grs., the average being 4·85 grs. In some cases there vas not sufficient nitrate of soda or ammonia present to account or the high sp. gr., but in all such instances the baths contained ree acid, which seemed to have quite as much effect on the test as he presence of the nitrates. In no case did I detect nitrate of aryta.

I cannot vouch for the accuracy of the strength of any solution f pure nitrate of silver, as indicated by its sp. gr. To my know- edge no reliable tables have yet been constructed. My estimate s based on the following rule, which I have made out by experi- nent. It will be found, I think, correct to within about a grain.*

When the sp. gr. is 1·052, or under, reject the integer, take the irst two places of the decimal as integers, and the third as a lecimal, then multiply by 5·75.

Sp. gr.	1·053 to 1·090	multiply by	5·5.
„	1·090 to 1·160	„	5·25.
„	1·160 to 1·190	„	5·2.

For instance, suppose the sp. gr. of the solution to be 1·146, eject the integer 1: taking the first two decimal places 1 and 4 as ntegers, and the third, viz., 6, as a decimal, we have 14·6; and as y the table 1·146 lies between 1·090 and 1·160, we have to mul- iply by 5·25—thus 14·6×5·25=76·65 grs. Now, observe, I do not y any means give out this rule as accurate: by a little *easing of he angle* the indications will be sufficiently near for practical pur- poses. Hereafter, should the subject be considered of sufficient importance, I may, with more time at my disposal, be able to fur- nish photographers with a more exact and reliable table. Should any one feel disposed to test the present one, he must not suppose that a newly made solution, say of 90 grs. pure nitrate of silver, dissolved in three ozs. of water, will show 30 grs. to the oz.; for the water, by the addition of the nitrate, has expanded to more than 3 fluid ozs., and ought to indicate somewhat less than 29 grs. Nor is this expansion equal by equal increments of nitrate: it diminishes upwards; and this is the great difficulty which besets us in the construction of these tables. A progressive law of expansion evidently exists, and probably may be ascertained by a few accurate and well-directed experiments. If so, a series of calculations will be all that is necessary for any strength of solution. After all, however correct we may make our tables for pure silver solutions, their accuracy will be sadly disturbed when testing impure materials. Of the fifteen old printing baths submitted to my examination, the fourteen whose average I have already given seemed to contain extremely little impurity derived from the original nitrate. Probably the free acid they all contained in a greater or less degree may be attributed to that source. But this seems not to have been the case in the exceptional bath. Its sp. gr.=1·193=about 100 grs. nitrate of silver to fluid oz.; whereas a correct analysis gave barely 90 grs. silver, and 21·5 grs. of other nitrates and organic matter. A large proportion of these 21·5 grs. was nitrate of potash. How this salt could have got into an old printing bath I am at a loss to comprehend, unless introduced originally along with the nitrate of silver. For such solutions as this, I admit, the sp. gr. test is utterly valueless.

To those, therefore, who may select this method of testing their old baths, I would recommend the use of at least tolerably pure nitrate of silver; the avoidance of chloride of barium, whose atomic weight is very high, as a salt for their paper; and the abstaining from the addition of any extraneous soluble matter: all of which will materially affect the sp. gr., and render any rule of calculation impossible. The temperature should also be taken into account—60° Fahr. being the standard. For every 10° below this, deduct 1 gr., and for every 10° above, add 1 gr. It may also be of importance to know that the blackening of a printing bath from use does not sensibly affect the sp. gr. One, indeed, I had as black as ink, which, after clarification by kaolin, was affected slightly, but not sufficient to alter the sp. gr. to the extent of $\frac{1}{1000}$. The discoloration I attribute entirely to the suspension of very fine undissolved particles of organic matter in the liquid. With these few precautions attended to, and after deducting from 1 to 5 grs. according to the more or less extensive use of the bath, the sp. gr. indication will tell us to within about 1 gr. the actual amount of silver present—sufficiently near, I should think, for all practical purposes.

As respects old collodion baths, this mode of testing is scarcely so reliable. In six specimens subjected to analysis, the error ranged from 2 to 7 grs.—all in one direction, viz., *below* the real quantity of nitrate present. I do not think we can fix this error so definitely as in old printing solutions; for, if a collodion bath when not in use be kept well stoppered or closed up, the error will be greater than if (other conditions being equal) it were left in a warm place and exposed to the atmosphere. It has been strongly urged that the error may sometimes lie on the other side, and an instance has been produced in proof. I am not by any means sure, but I believe, that one of my seven analysed specimens was the identical instance adduced. It was contained in a bottle labelled "old collodion bath," had rather a large sediment of flocculent organic matter, and smelt very strongly of stale pickles, masking completely the smell of ether and alcohol, if it contained any. The sp. gr. was 1·065, showing about 36 grs. to the oz.; whereas, by careful analysis, it contained only 26·95 grs. nitrate and 6·75 grs. foreign matter—a large proportion of the latter being organic. One fluid oz. freed from silver by chloride of sodium required 19 grs. dried carbonate of soda to produce neutrality. The acetic flavour being thus destroyed, the alcohol and ether should now have made themselves perceptible; but they did not, and I doubt whether a trace of either was there. I have therefore no hesitation in saying that this so-called collodion bath was never used for that purpose at all; or, if so, the ether and alcohol it contained, from exposure to the air, or from some other predisposing cause, were converted into acetic acid, which affected the sp. gr. to such a degree.

2. Hydrometer Tester.—To the form of this instrument as sold in the shops some strong objections may be urged. In the first place it is graduated arbitrarily, that is, it does not show the sp. gr., which in some measure would be a check on its correctness. Secondly, the stem is too short, and, in consequence, the scale is crowded into too small compass to enable us to read accurately its indications. In principle it is of course the same as the former method; and when we obtain good sp. gr. tables of pure nitrate of silver solutions, and a better mode of manufacturing the instrument, that it may show clearly on one side of the scale the sp. gr. and on the other the corresponding grains of nitrate, we may hope to see it extensively used, both on account of its approximate truth and its exceedingly simple mode of application.

3. Another class of instruments has been devised, depending on a different principle, viz., that 58·5 grs. of chloride of sodium will

* Since this paper was read Mr. Dawson has found good reason, on more careful investigation, to reject the present rule, and is now completing an accurate sp. gr. table from 10 grs. to 130, which will probably appear in our next issue.—Ed.

exactly precipitate 170 grs. nitrate of silver. Theoretically this should give perfectly correct results; and, even practically, with extraordinary precautions and extremely delicate instruments, we may depend on it to within $\frac{1}{300}$ of a grain. But what do we find with these instruments? We find them in the hands of different individuals, and even of the same individual, giving very contradictory conclusions—sometimes four or five and even more grains over the mark, and sometimes, but seldomer, as many below. Indeed this is not to be wondered at when we consider the many sources of error common to them all. It is difficult to obtain pure chloride of sodium and to dry it perfectly; for the water is not altogether expelled till it has ceased to crepitate under a strong heat. Our glass measures as usually sold are never accurate; and even were they so their shape and large surface precludes the possibility of their being accurately used. Moreover, as respects the instruments themselves, on account of their arbitrary graduation, we have no very obvious and ready means of ascertaining whether the error which is sure to exist ought to be laid at their door, or that of the solution, or both combined. In truth, the error is not constant nor always in the same direction, and cannot, therefore, be allowed for. None that I have seen have any arrangement for the violent agitation necessary for the complete clarification of the liquor without waste. Finally, when we recollect that a possible or rather probable large error in one drachm of nitrate solution has to be multiplied by eight, it is only a matter of wonder that their inaccuracy is not greater. A nice balance of errors may occasionally bring about a happy compromise pretty near the truth, but this must be of very rare occurrence. I have no hesitation, therefore, in condemning these instruments to the class of philosophical toys, fit only to amuse a photographic amateur and to waste his solutions on a rainy day.

A fourth method, founded on the same principle, has been proposed, possessing, however, all the defects of the previous plan, attributable to impure materials and imperfect measures, but avoiding others incident to the instruments themselves. It consists in dissolving in a certain quantity of distilled water pure dried chloride of sodium, sufficient to precipitate one gr. nitrate of silver by one fluid drachm of the solution. The relative proportions of water and chloride of sodium may be readily ascertained from the atomic weights of the two salts to be acted on. Since the combining number of chloride of sodium=58·5, and that of nitrate of silver=170, it follows by an easy calculation that 66 grs. chloride to 24 oz. water is about the right proportion. The mode of applying, and the probable results, of this test will be seen from the following experiments:—

I obtained from three manufacturing chemists of considerable repute as many specimens of so-called "pure chloride of sodium," which for convenience we shall call 1, 2, and 3. With each I operated separately on a new solution of nitrate of silver, containing rather over 80 grs. to the ounce. *I used three different sets of measures throughout in all the subsequent operations.* After drying for two hours a portion of No 1. on a sand-bath, at a temperature of about 400°, I weighed out 33 grs. and dissolved in 12 ozs. distilled water. I made similar solutions of Nos. 2 and 3. Two fluid drachms of the nitrate, along with the washings of the measure and a little nitric acid, were now poured into an 8-oz. stoppered bottle, and solution No. 1 added to the point of no more precipitation. I repeated the experiment with 2 or 3, using, as I have said before, different sets of measures. There was a very considerable discrepancy in the results—a solution containing exactly 80·25 grs. being represented by the numbers 78·5, 84, and 86·5 grs. respectively. To what causes are we to attribute so much uncertainty and error? Chiefly to the utter unfitness of our glass measures for such delicate experiments. For instance, besides their ordinary defects, which must be patent to us all, there is another and very curious source of error not generally known, attributable to the fact that, although our quarts, pints, and ounces are constructed as they ought to be, from the standard of the avoirdupois, our drachms, graduated into minims, are made from apothecaries' weight, containing 480 grs. to the ounce. They are, therefore, calculated to contain 60 instead of 54.7 grs. distilled water at the temperature of 60°.

Another mode of testing, which can scarcely be called of practical value to the photographer, but capable in the hands of one accustomed to chemical manipulation of great exactitude, is useful when we want to estimate how much foreign matter is present in our old baths besides nitrate of silver. Its principle is different from the former, and consists in precipitating the nitrate by pure hydrochloric acid; filtering, washing, and drying the precipitate along with its previously weighed filter, till they cease to lose weight and then calculating the nitrate from the weight of chloride. The filtrate, with all the chloride washings, when evaporated to dryness, will show by the weight of residue the other nitrates and organic matter which may have been present. A slight error in estimating the silver may occur when operating on a very dark-coloured old bath—a small quantity of organic matter (never according to my observation reaching ½ gr.) suspended in the solution being precipitated along with the chloride, detained by the filter, and not got rid of by any amount of washing. But, if we first clarify with dried kaolin, *no* organic matter is thus thrown down.

Having now expressed my opinions and the reasons for the same pretty freely, but necessarily very briefly, on the advantages and disadvantages of the several testing systems which have come under my notice, I may expect furious attacks from certain interested or over-sensitive parties, who may feel themselves aggrieved by my unbiassed and disinterested expression of opinion. To such individuals I may beforehand reply—and this is the only reply they may have—that unless they can show error in, and unwarranted deductions from, the facts I have adduced, no notice whatever will be taken of their communications. If they show either of these I shall be glad to retract my opinion for the higher pleasure of gaining a new truth. I have no hesitation then in pronouncing the hydrometer, when properly constructed, and when used with the proper precautions, superior to all the ordinary modes, and perfectly sufficient for the purposes of the practical photographer.

Should greater nicety be required, I am prepared with a method, or rather a modification of a method—and, indeed, had it incorporated with this paper—by which, without any great trouble or extraordinary manipulations, we can tell within $\frac{1}{600}$ of a grain the amount of silver in any solution. It is the plan I have adopted throughout the course of my experiments for checking the analysis by hydrochloric acid, which I was compelled to have recourse to in order to estimate the other nitrates and organic matter. The instruments I used were made by myself; and, in getting more artistic-looking duplicates made by Mr. Zambra to show you, an accident occurred which compels me reluctantly to defer this part of my paper to next meeting, or to consign it to a quiet corner of our Journal.

THE TANNIN PROCESS.—SOME IMPROVEMENTS IN THE MANIPULATION.

By Major Russell.

It seems useless to repeat what is contained in Mr. Hardwich's excellent account of the tannin process (an abstract of which appeared in your last, at page 121); I will therefore confine myself to points not to be found in it, and to those parts which I think can be improved upon.

In the first place I think it best to coat the glass with gelatine. This renders the process quite independent of the mechanical state of the collodion, which can be selected without regard to anything except sensitiveness and the quality of negative which it produces.

In my hands new, or nearly new, collodion gives the best results as well as the greatest sensitiveness. I am still making experiments to determine which is the best kind of collodion, and other doubtful points; but at present it appears that the film should be rather horny.

Bromide should be used largely; its addition rapidly increasing both sensitiveness and intensity up to three parts of bromide to eight of iodide. Further addition causes less and less improvement, till the best proportion appears to be reached at about two parts by weight of bromide to three of iodide.

The substitution of albumen for gelatine is not advisable, as it is not so effectual, contaminates the bath, and would be likely to injure the keeping qualities of the plates.

The excited plates should be thoroughly freed from nitrate. My practice is first to remove the greater part with distilled water, and then to soak the plates for half-an-hour in common water. Salt and water may be used without any detriment, if the salt be entirely removed again by copious washing.

The only fault of the process in my hands has been a tendency to blurring at the edges of the sky and high lights which is sometimes produced by various causes, such as great contrast of light and shadow, and over-exposure. The use of both gallic and pyrogallic acids on the same plate is not recommended, as it usually produces this annoyance.

I have only lately found out that this difficulty may be entirely avoided by using more acid in the developer, and that the stronger the solution of tannin the larger must be the proportion of acid.

annot yet fix the amount exactly; but to each grain of nitrate ould be added about one grain of citric acid for every ten grains tannin in one ounce of solution, which may be of any strength om ten to thirty grains to the ounce, the latter giving a rather ider and more vigorous negative than a weaker solution.

In all cases where gallic and pyrogallic acid have not both been sed, blurring round the high lights shows that enough acid has ot been used in developing. I find the most convenient strength the developing solutions to be—

(1) Pyrogallic ..... 96 grains.
Absolute alcohol and a few drops of ether.. 1 fluid ounce.
(2) Nitrate of silver..... 10 grains.
Citric acid ..... 10 to 30 grains.
According to the strength of the tannin solution.

The development being very rapid, the best way of using the bove is to mix two or three drops of (1) with one drop of (2) n the water required to cover a small plate, which will bring out ne impression very slowly, and give time to suit the treatment o the exposure by adding more of both solutions in such proortion as may be required. If much under-exposed only pyroallic, if much over-exposed only acid silver, should be added. his plan will be found to give great latitude in exposure.

HALATION:* ITS TRUE CAUSE AND REMEDY.

By Mr. Marlow.

[Read at a Meeting of the London Photographic Society, on Tuesday, April 2nd, 1861.]

OME three or four years ago, in conjunction with a photographer f this town, I made a few experiments with a view of ascertaining, f possible, the nature of the invisible photographic image. Among ther peculiarities of the collodion film the phenomena of halation ame under consideration. At first it was thought to favour the dea of the electrical nature of the latent image; but on examining ts characteristics more fully, I found that it was invariably seen lainest at the back of the pictures. This fact suggested a much impler hypothesis, and that it was in fact due to the light penerating through the film and glass to a reflecting surface at the ack of the latter, where a portion was reflected back to the under urface of the film and acted on it. To demonstrate the correctness f this view, I procured a piece of stained crimson glass and coated n the usual way with collodion. It is evident that with this arrangement, however much light might be reflected from the back, it would be non-actinic in its nature, and could not therefore expose the under surface of the film. This experiment was completely successful; for, although the picture was extremely over-exposed, not a trace of a halo existed. The reflectional origin of the halo was fully established in my mind, and I had ceased to think respecting it. My attention has, however, been recently drawn to the subject by a report of your January meeting; and the opinions then brought forward have induced me to reconsider the matter, and I beg to lay before you the experiments I instituted and the conclusions I have deduced.

I commenced with a view of settling a question or two which arose when I compared the stained glass experiment with Mr. Hardwich's "wandering" theory. I coated the above-mentioned stained glass plate on the stained side to prevent actinic light from going through, because I did not then see how the back reflecting surface could be destroyed. I thought it might be argued that the light was prevented from wandering in the glass. The only way of meeting this objection would be to destroy the reflection at the back of the plate. In these experiments I wanted the light which penetrated the film to pass into the glass, but not to be capable of being reflected back again. How was that to be accomplished?

With these ideas I began by examining a piece of glass that had one of its surfaces ground off. I found, by placing a coin vertically on its polished side, a shadow was cast on the roughened surface, the same as upon any other dead surface. This would not answer the purpose; for although the polish had been ground off, still it had a white surface, which would of course reflect actinic light. I now coated it with black varnish: by this means I concluded I should be able to get a dead black surface facing the front surface. On examining again with coin, as before, on its polished surface, and directing them to a strong lamp light, so that the flame could be seen where the two come in contact, I found all the secondary images which always appear under other conditions were not visible: instead of there being many images, there was only one, and that in close contact with the coin. I next took a piece of unground glass and coated with black varnish on one side; and, on examining it as I did the previous piece of glass, I found a dull heavy secondary image present.

Having ascertained these facts, I saw how to proceed, and took a piece of glass (No. 4) and ground half one side of it, coated with collodion, dried, and coated half the black surface with black varnish at right angles to the ground half, so as to make four experiments on one plate, and have them all exposed and developed under the same conditions. The four variations may be thus described:—1st, collodion film with polished surface behind; 2nd, collodion film with obscured or ground surface behind; 3rd, collodion film with black varnish behind; 4th, collodion film with ground and black varnish behind. The plate was exposed in such a manner that each quarter should have part exposed and part unexposed. After developing and scratching off a portion of the black varnish to examine the result, I found the experiment had exceeded my most sanguine expectations; for not only was that part of the film which had the ground and blackened surface behind free from halo, but that part also which simply had the black varnish behind. Nothing could be more conclusive. I send you the original experiment, that you may show it at the meeting. The figures refer to the four experiments on No. 4 plate. I should say that if the exposure had been prolonged, the quarter of the plate having simply the black varnish behind would ultimately have exhibited a slight halo, produced by the above mentioned secondary image.

Now, how does this agree with Mr. Hardwich's lateral wandering theory? certainly it is caused by excess of light, and the effect appears as though a lateral action had been going on. Unfortunately Mr. H. did not state where he considered the lateral wandering to take place—on the exterior surface of the collodion film or in the interior of the glass. I should say not the latter, or he would most decidedly have mentioned the fact of the halo always appearing plainest at the back of the picture, especially before the iodide is dissolved out. To my mind the experiments speak for themselves, and it requires no great amount of ingenuity to see through the whole affair.

Mr. Malone's supposition of outstanding rays not having been brought to the true photogenic focus is completely upset by the fact that the halo can be produced and avoided at will without a lens; consequently the optician need not trouble himself, as it is wholly out of his power to obviate it. The only true way is to black varnish the backs of the plates for pictures of interiors and other subjects in which parts are exposed out of proportion.

It will be well to state what I consider is the cause of the secondary images. That there are reflections or images coming from the back of the glass no one can deny, and that there is a surface reflecting light is very evident. What is the medium producing these images? There appears something like a surface of glass facing you as you look at the images. Is this delusive or real? I took it for a reality at first, and so it appears; but how can this be the case? it is difficult to conceive of an inner surface at the back of the exterior. If this is not the case, what is? Let us see what substance or substances there are present that might be likely to produce this reflecting surface. We have nothing but air in contact with the surface of the glass: can this be the cause or medium of reflection? Why not? How can air reflect under these conditions? It will be well to inquire what is the cause of reflection, or the conditions necessary for a perfect reflecting surface. Is it not the disposition of the particles at the surface, the levelling down of all microscopic prominences, and the presentation of an uniform surface which shall reflect light in one direction only? and according to the perfection of any surface in this respect, so is its reflecting capacity, other conditions being equal. Now the particles at the surface of the glass are so disposed, and the air coming in contact with them must of necessity take up this condition also, and present in an opposite direction a surface equal in every respect to the surface of the glass; or, in other words, the air is moulded into the form of the glass, which, having a polished or unbroken surface, must give to the air the same form. Having established this point in the inquiry, a question arises as to the capabilities of air to reflect light: this is answered very easily by referring to the fact that glass, which is a transparent body, reflects light readily. I am not aware of any difference of reflecting power having been observed in bodies of different densities, other qualities being taken into account. As far as I can judge, I should say that the air at the surface of the glass reflects about the same amount of light as the glass does, other conditions being deducted. How to prove the reflective power of the air at the surface of the glass was the next point to be settled. At first I thought I would try the substitution of vapour of iodine for atmospheric air; but this would not be likely to answer, because the iodine would take

* See remarks in Leader.

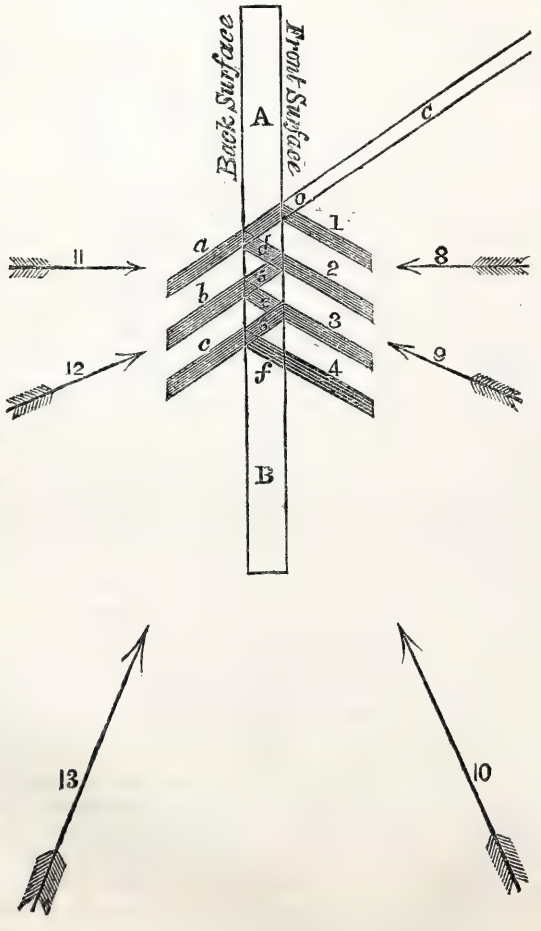
up the form of the glass, and reflect the same amount of white light as polished and coloured surfaces do. I again took a piece of glass stained on one side, coated with collodion on the opposite side. By this arrangement it is evident that the light which penetrated the film, glass, and stained surface would be rendered non-actinic in its nature on its return from the reflecting surface of air at the back; consequently the under surface of the collodion film could not be exposed. The result of the experiment (see plates 9 and 10) proves the correctness of the theory; for the plain glass plate that was exposed with the stained one has a fearful halo, while the stained glass is totally free.

There are difficulties attending the use of black varnish in the wet process, and to find a good substitute was well worth trying for. I tried black paper by merely wetting it, and carefully pressing it down to exclude all air-bubbles: it was only partially successful. I next tried black japan leather wet with water and pressed down to the glass, having previously ground the polish off. This was much more successful, and is a good substitute for the varnish: it is not quite so potent as the varnish, there being a slight reflection, but if the exposure had been prolonged it would have been more palpable. I think I shall be able to get a still better substitute, and will let you know when I have tried it.

It is worthy of remark that black varnish and wet ground japan leather also exclude the air, and present a surface that appears to reflect less and absorb more light than atmospheric air does.

Of course the black varnish must be removed before the picture can be developed. This is easily done by moistening a piece of rag with naphtha and rubbing it over the varnish, which is easily dissolved; and if there is not too much naphtha present, the asphaltum can be removed without any risk of getting any on the front side of the plate. One or two trials will make any one sufficiently expert to do it in a short space of time. The best way to apply the varnish is by means of a camel-hair pencil: there is not so much danger of getting any on the front side as there is when it is poured on and off again.

From the above experiments I think I have established the true cause of the halo, and that it is not caused either by lateral wandering or unfocussed outstanding rays; but that it is caused by a peculiar action at the surfaces of the photographic tablet. If I may be allowed the privilege of theorising I would give the following illustration as explanatory of the ideas I have concerning it.



Let A and B represent the edge of a sheet of glass; C a ray of light impinging upon the surface at O; *a*, *b*, and *c* are rays that pass out of the back surface; 1, 2, 3, and 4, rays that pass out of the front surface; 1 is the only portion of the original ray that does not pass into the glass; *a* is the only portion of the original ray that does not suffer any reflections; 2, 3, and 4 are all reflected from the air which is in contact with the glass at the back surface; and *b* and *c* rays that pass from the air at the front surface. Or to put it in another way:—Let C be a ray of light impinging on the surface of the glass at O; a portion is reflected back in the direction of 1, while a portion passes through the glass to the reflecting surface of the air, a portion escaping while another portion is reflected, passing along *a* to the front of the glass, a portion passing out along 2, while that which remains is reflected from the air along 5, and so on till the light is expended. This I am satisfied is the case from what I have seen and shown to others. By holding the glass at a certain angle to a strong light, the secondary images may be seen on both sides of it, the light impinging and the coin held on the same side in both cases. The images seen on the front side are much more brilliant than those which have passed through: this of course must be expected, because each one is a step behind the others on the front side in regard to numbers. A portion of the light having passed off at the time of each reflection from the front and back surfaces, this latter action accounts for the diminished brilliancy of each image on both sides. These images, when viewed from 9, have a given distance from each other; when viewed from 8 their distance is increased, and from 10 diminished; when viewed from 8, there are but two or three images, from 9 more are seen, and from 10 still more: the reason is obvious—they also diminish in size. When the diagram was first drawn I had not seen the images at the back of the glass with the light and coin still on the front side; but seeing that the air at the front surface must of necessity give off images the same as the air at the back surface, I began to look for them in the direction of *a*, *b*, and *c*, when to my great delight I saw them, and, as before stated, much less brilliant than those on the front surface. They follow the same law as the front images do, that is, less in number at 11, increase in number as the acuteness of the angle is increased at 12 and 13: they are also nearer to each other when viewed from the latter places.

Explanation of the Glass Plates accompanying this Paper.

No. 1 is a piece of plain glass. Place the edge of a coin on either of its surfaces, tilt then so that a good lamp or gas-light may be seen where the two come in contact. According to the angle at which they are held in reference to the light and the eye there will be seen one, two, three or four distinct images, or even more, according to the thickness of the glass, the angle at which it is held, and the intensity of the light. The thickness of the glass also varies the distance of the images from each other.

No. 2 is coated with black varnish. Place coin on and examine in the same manner as the above. On those parts where the design is absent, I have not been able to detect more than one secondary image, which appears very dull and heavy: this I attribute to the almost total absorption of the light which has passed through the glass to the reflecting surface of the black varnish on the other side, rendering it so feeble as only to be able to be reflected once. Next compare the design with those parts in which the varnish is not disturbed; notice the difference in the amount of light coming from each when held so that the flame of a lamp, &c., is seen upon its unvarnished side: the parts on which there is no varnish give off considerably more light than those varnished.

No. 3. This is ground glass black varnished on the ground side. Examine with coin as before. It will be seen to give only one image, and that in close contact with the coin, because the polished surface has been destroyed, and the white rough surface rendered absorbent to light by the black varnish.

No 4 plate has been referred to before as half ground and half black varnished at right angles to it. I need say no more about it.

No. 5 is a plate that has been exposed in the camera. This shows the effects of over-exposure, which has been so great as to render the sky through the window transparent: this is termed by some the reverse action of light. On examining the external surface of the film a kind of halo is seen, which I suppose is similar to that which Mr. Malone referred to. I do not consider it to be wholly due, if it is at all, to outstanding rays that have not been brought to the true photogenic focus; for, on examining a plate with the image of the sky through a window upon it, from the inside of the camera there will be seen (especially when the air is foggy) light streaming from it in all directions into the camera, lighting it up considerably. Now we know that the air is a material substance,

olding in suspension watery vapour, more or less, at all times; nd, according to its state in this respect, so is its power of being luminated and its power of reflection. This illuminated atmos-here (if the exposure has been considerable) acts upon the adja-nt parts sufficiently to cause them to blacken when the developer applied to bring out the picture. This plate also shows the emarkable preservation from halation exercised by the black arnish: not a trace of a halo is then to be seen. I had pre-upposed that for exposures sufficiently long to produce the trans-arency in the sky would require the back surface of the glass to e ground as well as varnished; but merely blackening is quite ufficient for most purposes, if not for all.

No. 6 is exposed just under the transparent state. It exhibits o halo save at the back of the film, where there has been no black arnish to absorb the light which passed through the film.

No. 7 plate shows what black paper will do at the back. It was nerely wet with water to make the two as much as possible into ne compact body. It produced a little effect—by no means so omplete as black varnish.

No. 8 shows the effects of black japan leather, the surface of vhich was ground in the same manner as glass with emery and vater. The numbers refer to conditions at the back of the plate:—No. 1 had dry black cloth at back; No. 2, ground black japan calf-kin at back; No. 3, black varnish.

Nos. 9 and 10 are two collodionised sheets of glass; No. 9 is ordinary glass; No. 10 is stained yellow at the back. They were oth exposed at the same time, under the same aperture, in a piece f blackened card. I may mention here that all the other plates vere exposed in the same way, except those that were exposed in he camera. The two were exposed at the same time, so that hey might have the same exposure, each plate being placed half-way over the aperture; and when they are viewed side by side he contrast is very striking. I have made several more experi-ments in another direction, but my professional connexion pre-vents me saying much about them: suffice it to say they all point n the same direction, and only modify the defect under con-sideration.

If in this paper I have advanced any views inconsistent with facts known to any of the members of the Society I shall be most happy to be corrected.

THE ALBUMEN PROCESS OF M. FERRIER,

AS PRACTISED BY MR. NEGRETTI.

The advantages that the albumen process presents over the other dry processes more usually practised by photographers is—superior definition; greater hardness of the film, whereby negatives are enabled to stand much greater wear and tear when a vast number of proofs are required from them; eminent keeping properties both before and after exposure; perfect control over the develop-ment of the image; and last, not least, the fact that albumen can be obtained in any part of the world where fowls are propagated, which is more than can be said of collodion. Therefore it has special claims on the attention of travelling photographers, as, with a sup-ply of glass plates, iodide of ammonium, nitrate of silver, acetic and gallic acids, they may follow their art in any clime.

The following is an outline of the method of manipulation:—

The Glasses must be clear, of good surface, and *perfectly* clean, or the albumen will not flow well when poured on. The glasses should be cleaned with tufts of cotton wool, and the following mixture:—

Fine tripoli or precipitated chalk	20	parts.
Alcohol (36°)	80	„
Liquor ammoniæ	10	„

Polish as usual.

The Albumen should be beaten up in a Berlin evaporating basin, having a small lip, with a silver or wooden fork, and be pre-pared fresh as wanted. About ten ounces of albumen should be made at a time. For this purpose ten large fresh eggs are selected, as each egg is estimated to contain an ounce of albumen. Each egg should be broken separately on the edge of a cup, and the yolk and germ very carefully separated from the white, the shells them-selves being employed for this operation: the produce of each egg is then thrown into the basin. To the albumen add one per cent. of iodide of ammonium dissolved in twenty per cent. of distilled water: now beat up the albumen for about a quarter of an hour, till the whole is converted into a froth, so thick and hard that pieces may be pulled up bodily with the fork when plunged into it.*

* Although shaking up the albumen in a bottle serves very well for the purpose of albumenising paper, this method is quite inadequate for the requirements of the glass process.

The basin should now be carefully covered in with a sheet of paper to prevent the access of dust, and put aside for six hours. After the froth has subsided, a thick crust is formed at the top: this serves as a filter for the substratum of albumen, which has to force its way through the crust when being decanted from the basin on to the plate.

The Dark Room should be carefully freed from dust some two or three hours before it is used, the floor being watered and swept, and all shelves and ledges well wiped with a damp sponge; for dust is the principle cause of blemishes in the albumen film, and, to prevent disturbing it as much as possible, it is advisable to take in all material required at one time, just before commencing operations. It is desirable that the room should be kept at a moderate tem-perature, though this is not essential.

The Plate-holder is a round tapering stick, about half an inch in diameter and nine inches long, having at one end a small cup, about an inch in diameter. Round the edge of the cup, which is about a quarter of an inch thick, some gutta percha is melted.

Coating the Plate.—Place a clean sheet of white paper on the operating table; on this place, best face downwards, a cleaned glass plate: fix a piece of gummed paper on the back, that the unalbumenised side may be more readily recognised in after operations. Warm the gutta percha of the plate-holder in the flame of a spirit lamp, then press it on the centre of the back of the plate: in a few seconds it will have cooled sufficiently to adhere firmly to the glass, so that it may be turned and whirled in any direction. Now hold up the plate, and with a soft flat brush remove any dust that may have stuck to the plate. Pour the albumen from the basin on to the plate in the same manner as if coating with collodion, and, if necessary, assist the even flowing with a glass rod. Drain the albumen off, first at one corner then at the other; tilt the plate, so that the fluid may again pass over it; again tilt the plate, and when the albumen has reached halfway across it, impart a rotatory motion to the glass by means of the holder worked between the hands; continue this for seven or eight seconds, then place the hand close under the plate and force it off the gutta percha. If any dust fall upon the plate during the operation, draw a fine camel-hair pencil between the lips, and pick off any spots with the point. Each glass, as finished, must be stowed away in a groove of the drying box, and in the course of a few hours they will be ready for sensitising; or, if stored in boxes in a dry place, they may be kept for years before that operation is effected.

The Drying Box must be made of well-seasoned wood, properly put together, and furnished with levelling screws. On each side a number of grooves run parallel to each other, the sides being just the width of plates apart. In each alternate groove a board slides freely, so as to separate each plate one from the other. The inside of the box must be well dusted before use, and the boards cleaned and thoroughly dried before a fire or in the sun, so as to render them absorbent, otherwise the film will not dry easily.

Sensitising the Film.—The bath preferred for this purpose is a horizontal one—in fact a dish with a perfectly flat bottom made of plate glass. The dish should be about one-third longer than the plate employed. The sensitising solution is thus consti-tuted:—

Nitrate of silver	10	parts.
Acetic acid	10	„
Distilled water	100	„

This is poured into the dish till it stands about a quarter of an inch high. The bath is then raised at one end so as to keep the solution at the other. The plate is placed in the empty part, albumenised surface upwards, when by a dexterous movement of the hand the dish is brought level, and the solution allowed to pass quickly and evenly over the plate. The plate should now be raised and lowered several times by means of a flattened silver wire, bent at one end into a right angle: in about forty seconds the plate may be removed from the bath. The same care must be taken, as in sensitising a collodion plate, that the solution passes evenly over the film, for wherever there is a stoppage there will be a sharp clear line.

The plate when removed presents a nice light blue tint. It must immediately be well washed back and front with distilled or rain water; for, if any aceto-nitrate solution is left on, the picture will show black stains at that part The water should be allowed to flow over it till no greasy streaks are perceptible. The plate is now placed in a box to drain, with the lower edge resting on blotting paper, and the upper edge against the side. The plates may be used moist, or, if intended for keeping, they should be thoroughly dried before being stored away in grooved plate boxes,

or in the camera slides. The sensitising solution should be filtered back into the stock bottle, and may be used over and over again, even when quite black.

THE EXPOSURE IN THE CAMERA must be governed by the usual conditions. In Italy good negatives are taken in three or four minutes; but in this country, in summer, a good negative might be obtained in ten minutes, with a lens 2½ inches in diameter, and of 15 or 18 inches focus, or about five minutes for stereoscopic plates. Practice alone can determine the proper amount of exposure, according to the lens employed and the nature of the light at command.

DEVELOPING THE IMAGE.—Place the plate on a levelling stand, and pour over it a saturated solution of gallic acid, which has been warmed to a temperature of 80° Fahr., spread it rapidly over the plate with the aid of a soft brush, the hair being about an inch long. There is no fear of using the brush freely, as it would almost require a knife to scratch the hardened albumen. After the solution has been on a minute or two pour off a portion, and to that remaining on the plate add some of the following:—

Nitrate of silver	2 parts.
Distilled water	100 „

Rest the brush on the plate, pour the nitrate solution over the brush, and rapidly mix the two solutions together. In a few seconds the picture begins to appear, if the plate has been properly exposed: if, however, it is under-exposed, the image does not appear until the solutions have been changed and the previous operation repeated several times—in fact, a picture has to be coaxed out of an under-exposed film. If anything should prevent the operator from proceeding with the development, the plate may be well washed with water, put away in the dark, and be fully developed on a future occasion.

The image may, by the assistance of a warm solution of gallic acid, be developed in ten minutes; and should, with proper attention, *never exceed* three-quarters of an hour.

FIXING THE IMAGE is conducted as in the collodion process; but cyanide of potassium must never be used, as it strips off the albumen.

Hyposulphite of soda	4 ounces.
Water	4 „

Wash thoroughly with water. No varnishing is required for plates taken by this process.

POSITIVE TRANSPARENT PICTURES are printed by superposition, in diffused light, on plates extra thinly albumenised. Extra thinness is imparted to the film simply by rotating the plate more rapidly and for a longer time. The development must be effected as quickly as possible; but not by increasing the strength of the nitrate solution, as this would only lead to the positive being spoilt. Much speculation has been excited as to the manner in which M. Ferrier produces his exquisite stereographs, and it has been thought by many that they are obtained in a coying camera from large transparent negatives; but Mr. Negretti positively asserts that this idea is erroneous.

The principal drawback to the prosecution of the albumen process in hot climates is the difficulty of obtaining rooms or cupboards from which dust can be *perfectly* excluded; and this is the reason why Messrs. Negretti and Zambra's operators in China and Japan are forced to take their negatives on collodion—otherwise by the albumen process they could obtain a still greater amount of definition and detail than they do even now in their present beautiful and interesting productions.

ON THE FOTHERGILL PROCESS.

By ARCHIBALD BURNS.

[Read at a Meeting of the Edinburgh Photographic Society, April 3, 1861.]

I FEEL that, in bringing before you the details of a dry process about which so much has been said and written already, some apology is necessary on my part. I have only been induced to do so at the request of some of the members who have not yet attained that certainty of obtaining good results which it is so desirable to acquire, especially when operating at a distance from home.

The enthusiast who (making light of the necessary load of baths and bottles) follows the wet collodion process, tells us that he always knows what he has got before leaving the place. This knowledge, however, is not invariably of a cheering description, failure being quite as common with the wet as it is with the dry-plate photographer—while the convenience with which dry plates may be prepared at home, and carried about for exposure, offers great advantages to the amateur who wishes to make a pleasure and not a toil of his photographic rambles.

I have had some little experience in landscape photography with the wet collodion process, and but for the greater convenience and certainty with which good negatives may be obtained with preserved plates I must have given up the practice of the art long ago.

The process to which I have given most attention, and with which I have got the best pictures, is the one known as "Fothergill's," or the washed albumen process.

It was first announced to the public in the end of April, 1858, and soon became a general favourite with amateurs. My first trial was successful beyond my most sanguine expectations; and, although I have obtained good negatives with other preservatives, such as gelatine, gum-arabic, malt, milk, &c., I have never been able to feel so confident of success as when working with washed albumen. With a view of assisting those members of our society who have not yet attained sufficient skill in the preparation of dry plates to work with certainty, I propose to read over with considerable minuteness of detail my method of working, and to illustrate the subject practically, by exhibiting before the meeting the preparation and development of a dry plate.

I prefer a collodion of the non-contractile kind, which gives a rich creamy film when sensitised, and it must adhere firmly to the plate. After trying a great many of those which are advertised as suitable for the various preservative processes, I have settled down to the exclusive use of that made by Mr. Nicol, Dundas-street. It is quite as good as any of the others, and is always at hand when required.

The silver bath is thirty-five grains to the ounce of distilled water, and faintly acid with acetic acid. If it is in a good condition for taking negatives by the wet process, it is also in good condition for the dry.

The albumen wash is made by adding to the white of one egg two ounces of distilled water, and ten or twelve drops strong liquor ammonia; beat the whole into a thick froth with a wooden fork or a few quills tied together, and allow it to settle for a day or two: it should be filtered just before use. A piece of moist sponge pressed slightly into the neck of a funnel makes a convenient filter.

The developer consists of—

I. Pyrogallic acid	3	grs.
Citric acid	1½	grs.
Distilled water	2	oz.
II. Nitrate of silver	10	grs.
Distilled water	1	oz.

I generally use polished flatted crown glass: it is much cheaper than patent plate, and if handled with care will stand a great deal of printing. Having ground off the edges and corners by rubbing on the hearth stone or window sill, wipe off the particles of grit and clean with a little waste collodion in the usual way, placing them in a box ready for use. In addition to being chemically clean, it is desirable to have the plate freed from damp: this I usually effect by passing the clean plate back and forward over the flame of the gas, until the moisture which is deposited on the surface is driven off (taking care not to warm the plate unequally or to make it too hot), and giving a final polish with a clean and dry wash leather: fix it on the plate-holder, and brush both sides and edges with a broad camel-hair brush, such as is commonly used with the copying letter book.

Coat with collodion in the usual way, and as soon as the film has set at the corner from which the collodion has been poured off, reverse the slope of the plate and hold it in the reversed position for some time before dipping it into the bath. Let it remain in the bath longer than it is usual to do when working the plates wet—say for about a minute after having got rid of the greasy appearance by the usual up and down motion. On removing it from the bath rest one corner on a pad of blotting paper, wipe the back with a piece of damp sponge, and, placing it in a flat dish with just sufficient distilled water to cover it, gently raise one end of the dish two or three times, causing the water to flow backwards and forwards over the film, and leaving it in the distilled water, prepare another plate; then having dipped it into the silver bath return to the one in the distilled water; again gently raise the end of the dish two or three times, and with the aid of a silver wire or glass hook remove it and fix on another plate-holder (not the one used for coating with collodion). Swill the film with a very little distilled water: if it runs off smoothly it has been sufficiently washed, but if it leaves a greasy appearance repeat the swilling with fresh distilled water till all greasiness has disappeared. Then, after draining by one corner on blotting paper for a few seconds, pour on a little of the dilute albumen at one end, cause it to flow

ver the film in a continuous wave (well up to the edges), and rain off at the opposite end. Again pour on a few drops of lbumen, and by inclining the plate cause it to flow all over the lm in various directions for about half a minute; then wash off as uch as possible, using plenty of common water, finishing by looding with distilled water, and setting it on an end on blotting aper to drain for a little; remove it to a dark place free from ust to dry spontaneously.

Plates prepared in this way may be kept for a month or six veeks without any perceptible deterioration; indeed I have kept hem for upwards of five months, and then obtained a clean and igorous negative with the usual exposure and development.

The exposure in the camera is a matter about which no definite irection can be given. I always try to expose for the details in hadow, without any fear of the high lights being over-done. On ooking over a number of negatives taken with a view lens 5¼-nches focus and ¼-inch stop, I find that the general exposure is bout two minutes: it is always the safest plan to give a full llowance of time. An over-exposed plate may sometimes be emedied in development, but an under-exposed one is quite useless.

The development I look upon as the most important part of the vhole process. I feel confident that there are more plates spoiled luring development than at any other part of the manipulations. Having moistened the film by dipping the plate in a dish of dis-illed water, fix it on a plate-holder, and pour into a glass measure wo drachms of the pyrogallic developer; add three drops of the ilver solution; after mixing them well together, cover the plate vith this as quickly and evenly as possible, and drain it back into he measure: do this two or three times, and then pouring on the leveloper keep it moving about all over the plate. The picture hould begin to appear in about a minute, but it will sometimes take much longer time. The developing solution should be changed whenever it shows signs of getting the least muddy, and the plate hould be washed before applying the newly-mixed developer. The proportion of silver should not be increased until the details re well out, and then a few additional drops may be added to ncrease the intensity and complete the development.

If from over-exposure the picture should start out immediately he developer is poured over it, I at once pour it back into the neasure, and, after well washing the plate, add two or three addi-ional drops of the silver solution, and proceed as before: this plan ometimes enables me to get sufficient contrast in an over-xposed plate, but it is not always successful.

I fix with cyanide of potassium, and, having washed thoroughly, dry before the fire, and varnish while warm.

I am quite aware that there is nothing new in what I have brought before you, but such is the simple method by which all my best pictures have been produced; and, to those who will carry out these details with ordinary care, I can promise at least as much success as the pictures which I have placed before you exhibit. If exposure has taken place under favourable circum-stances, failure will be the exception, not the rule.

In conclusion, I would just add that although these details may seem tedious in description, in practice I do not find them so; and, should I appear somewhat awkward in my practical illustrations, you must attribute it to my want of experience in exhibiting publicly those manipulations which hitherto I have only been accustomed to perform in the privacy of my own dark room.

STEREOGRAPHS.

Scottish Lake Scenery, illustrated by GEORGE WILSON, *Aberdeen.*

MANY of our readers will, doubtless, remember the emotion of delightful surprise with which they first beheld the beautiful addition to our art-treasures, produced by Mr. Wilson about a year and a-half ago, in the form of a series of sunset effects on the Loch of Park, in Aberdeenshire, and which were first noticed and described in our columns. During the last season—that of 1860, inclement as it was, and disheartening in the highest degree to the professional photographer—this gentleman pursued his avocation with unwearied diligence, and in spite of all impediments secured a goodly collection of new triumphs of his skill. It is true that, from his peculiar mode of operating, he is exempt from some of the troubles which beset ordinary photographers; for he laughs to scorn the puny efforts of wind and waves, clouds and vapours, to elude his powerful grasp, so that he gives us Nature in all her lovely aspects: now with the waters dancing in the laughing sunshine—then the rough hill-side, half shrouded in the clinging mist, like tears on the cheek of the aged pilgrim—at another time the angry clouds frown over the grand but dark abyss—again we are hurried to the fierce active life of the crowded thoroughfare—and end by lingering in the calm shades of evening, over some soft landscape that has a charm like the gentle smile of an innocent child as it sinks into slumber.

In giving some account of the exquisite specimens now before us, we will endeavour to be as brief as justice to our subjects will permit.—In the first place we will mention a second series of views from the LOCH OF PARK, ABERDEENSHIRE, all produced by an "instantaneous" exposure, revealing all the passing charms of cloud and ripple, with other incidental adjuncts.—In No. 278, WILD-DUCK SHOOTING, besides a splendid sky reflected in the placid water of the lake, the smoke from the sportsman's gun (who, standing up in the boat, has just fired) possesses all the rich transparency of nature, veiling, and only just veiling, the distant shore.—In No. 284, EVENING, the sun has set behind a dense mass of clouds in the horizon, but still lights up some of a more fleecy character in the zenith, while the water is now calm and level as a mirror, the surface only broken by a few protruding rushes and a solitary boat.—Akin to the last-named is No. 280, TWILIGHT; and, though in this the shadows are so long, and definition of the landscape consequently so obscure, that a mere commonplace photographer would despise the composition, yet, in so doing, he would only expose his ignorance and want of discrimination; for, despite its admitted deficiency, it is a perfect gem of art, displaying perhaps as fine a sky and aërial perspective as ever was delineated.

No. 279, PIKE FISHING, with some fine effects of sky and ripple, presents also a trifle of the grotesque in the comical attitude of the fisherman.—Of the remaining sun-lighted views, Nos. 281 and 282 deserve especial notice—the former with the great luminary of day nearly hidden by clouds, the latter with it shining in full effulgence, and adorning the water with a streak of gold.

Of sweet LOCH KATRINE we have some very charming illustrations; and foremost amongst them we must place No. 9, which, for perfection of composition and calmness of repose, is not surpassable. It is veritably a perfect picture, and is the same subject to which we accorded high commendation amongst those displayed by Mr. Wilson at the Photographic Exhibition, recently closed in Pall Mall, London. It is very beautiful.—No. 30, another part of the lake, not very distant from the preceding, is also a fine composition. A clump of birch trees on the near bank fills the whole of the foreground, and indeed forms three-fourths of the whole subject. Through the branches of the trees, across a narrow portion of the lake, the steamer at the landing-place is just discernible on the right; while on the left a thatched boat-house may be noticed behind the point of a rough stone quay, and the wooded precipitous mountain-side makes an appropriate background.

LOCH KATRINE FROM BEN VENUE (No. 65) is another magnificent piece of Scotch scenery very unlike the two preceding, and comprising a view of some miles in extent. The waters winding amongst the rugged, rocky mountains, clothed in patches with luxuriant ferns and fragrant heather, are charming in their seeming caprice. The following lines recur to our mind while gazing on this pleasant scene:—

"We have left the world behind,
We have lost the beaten track,
And the hum of the city upon the wind
We have only to guide us back.

"In the wood where the hyacinths grow,
And the earth is as blue as the sky,
We wander to-day till the sun sinks low,
And the rosy shadows die."

LOCH KATRINE AND BEN VENUE *from the Dale of the White Horse* (No. 26) is a scene of another character, and again we must have recourse to the poet for its description:—

"Like dreary prison walls,
The stern grey mountains rise,
Until their topmost crags
Touch the far gloomy skies:
One steep and narrow path
Winds up the mountain's crest,
And from the valley leads
Out to the golden West."

In the next slide we have another view of BEN VENUE FROM LOCH ACHRAY (No. 59)—another charming composition. A wooded islet in the centre of the calm lake, with old Ben in the background, are both seen through a vista in the spreading branches of a sturdy oak tree, which act as a graceful frame to the composition.

THE PASS OF THE TROSSACHS (No. 21) is particularly interesting from the variety of the foliage everywhere discernible in the wooded part of the pass. The numerous fir-trees are pleasantly contrasted with the birch, the tall graceful fronds of the ferns, and the crisp leaves of the holly on either bank of the shallow brook; and the

bare sides of the high mountain in the background act as an agreeable foil to the vegetation.

GLENCOE is rich in affording subjects of a peculiarly grand and solemn class, and Mr. Wilson has been busy amongst them. In several of them some very picturesque effects have been secured by taking advantage of moments when the curious clinging misty vapours, so prevalent in mountainous districts, have come creeping down the various gorges and passes between the taller peaks.

"See! down the mountain side
The silver vapours creep,
They hide the rocky cliffs—
They hide the craggy steep—
They hide the narrow path
That comes across the hill——"
* * * * *

In No. 154—GLENCOE FROM ABOVE CLACHAIG—there is a broken band, as it were, of mist, a few hundred feet from the top of the mountain, and there are no less than four specimens (No. 272) all of the same spot, but differing in the amount and forms of the ever-shifting vapours. These are all charming; but perhaps the most so is that one where a couple of sheep have strayed into the immediate foreground of the subject.

Nos. 153 and 157, both VIEWS IN GLENCOE, are admirable illustrations of the locality; and the last-named one is especially picturesque, with its very broken rocky masses, the top of the mountain just tipped with light vapour, and the chasm in the foreground moistened with the soft spray from the "falls" of a little mountain stream.

Those who are making collections of geological illustrations, as well as all those who are connoisseurs of the picturesque, must not fail to secure copies of THE FALLS OF BRACKLIN, *near Callander, Perthshire;* for anything more truly beautiful it would be difficult to imagine—in addition to which the peculiar rectangular cleavage of the rocks imparts all the appearance of massive but ancient masonry "with verdure clad."

Nos. 63 and 64 are both very remarkable. In the former the rounded sides of distant hills in the background leave a small vista towards the sky, broken by a solitary tree: in the foreground the stream gently tumbles over the natural gigantic steps, having worn a deeper passage by its ceaseless tread, while the huge blocks of stone are thickly strewed with lichens and crowned with shrubs. —No. 64 is a composition that would afford a welcome study for a painter: it is one absolutely perfect of its kind, and is probably taken from a spot not far distant from the preceding. The same stream is tumbling over similar natural steps, clothed with lichens and ferns and bushes; branches also of the ash, and the alder, and holly are mingled here and there, and the whole is viewed through a magnificent framework composed of the boughs of a luxuriant oak tree. This is a gem of the first water.

No. 25 is another of the same tribe—BRACKLIN BRIDGE—a little wooden footway, with a railing perched high up over the top of the chasm, while the rock is split and rent into the semblance of a massive castellated stronghold of ancient days, with the same stream as before slipping down more steps, and various trees nestled in snug nooks and crannies in the rock, as if they had selected comfortable quarters to protect themselves from the rude blast to be expected in those elevated regions.

We must, for want of space, bring our remarks to a close—a matter we always find it difficult to do when gloating over the works of such an artist as Mr. Wilson, to whom we are indebted for many a pleasant hour. While such works as these continue to be produced there is no fear of any decline in the popularity of the stereoscope, as view them when we will they are always a source of fresh gratification.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By JOHN CRAMB.

No. V.

JAFFA — LYDDA — RAMLEH — KIRJATH JEARIM — ARRIVAL AT JERUSALEM.

JAFFA, as it now stands, contains about 5,000 inhabitants, a fifth part of whom are Christians. The entire city is enclosed by a strong wall, and has but one gate through which all the traffic inland must pass. The streets are very crooked and dirty, and cannot be said to be paved at all. Smooth round stones are laid down here and there, sometimes so close as to form a kind of causeway, but which at best are very uncomfortable to walk over. The city is built on an eminence, which gives it a very fine appearance from whatever side it is viewed, though the country is nearly level all around. From the house-tops in the higher parts of the city a very extensive and beautiful view is obtained of the lovely plain of Sharon on the one side and of the Mediterranean on the other. The rich deep green of the gardens around Jaffa will live as a delicious spot in the memory of many a pilgrim to these lands. There is a considerable trade carried on, I believe, in exporting fruit. I saw the orange exportation going on vigorously. The Jaffa oranges are very fine, and highly esteemed all over the East.

Jaffa is traditionally one of the oldest cities in the world, and has figured largely in Eastern history. It is connected with two of the most despicable acts in the life of Napoleon, called "The Great." The *first* was the poisoning of his *own sick* to relieve himself of the burden of carrying them further; and the other was of a kindred nature, the cool butchery of 4,000 Albanians, who had capitulated to his generals on the express condition of their lives being spared. How many of the acts of so-called great men are as mean, cowardly, and villainous, if we can only get out of the glare of the glory which surrounds them to see their acts in their true light, I know not. For these acts the Corsican tyrant has not, even in France, found an apologist.

We saw little of interest in Jaffa: a lot of crowded bazaar stalls and lazy Turks sitting (as they only can sit) smoking, or sipping coffee, and that is all—if we except a house shown as the veritable house of Simon the Tanner.

I had landed at Jaffa on Wednesday morning, and was anxious to get on to Jerusalem before the Sabbath, if possible. But, as I might not return the same way, I was equally desirous of having views of Jaffa, Lydda, and Ramleh, and if possible Kirjath Jearim, before going to the Holy City. My manner of proceeding in my photographing required me to darken a room or wait till evening, when that would be done for me. I had no dark tent for working in the field, as I proposed depending for all my views *alone* on dry albumenised plates. Wherever I would be likely to remain some time, as in Jerusalem, I could arrange to darken a room, and thus be able to sensitise plates, and develop, &c., during the day; and, if I felt so disposed, try a wet plate, if only to see how the collodion I had brought with me would work. The first evening I spent in Palestine I sensitised a few plates, which I exposed next day, and developed in the evening. As I proposed to leave the following day (Friday) for Ramleh, going by Lud—the Scriptural Lydda—I prepared plates to serve for use in both those places.

There was no further difficulty in my photographic operations at Jaffa, beyond what I have mentioned in the notes of my experience at Malta, only in a very much increased degree. The Jaffa water is obtained from springs, and is very salt. That had no mischievous tendency in the washing operations; but in the development I had nearly failed altogether to obtain a shadow of a picture. But patience, and the addition of a very large amount of silver to a fresh developing solution, gave a fair picture, and I went on with the others, not losing one plate.

I read a paper on the albumen process at the meeting of the Photographic Society of Scotland, on the 9th instant, in which my ordinary manner of operating is given, and which will appear in THE BRITISH JOURNAL OF PHOTOGRAPHY. To it I refer my readers for a full description of how I had been in the habit of working before I went to Palestine. As I go along I will add what difficulties I experienced, and how I overcame them.

Before I had finished the development and fixing of my pictures of Jaffa, and prepared a sufficient number of plates with which to "take" Lydda and Ramleh, the evening was far spent, and I was very tired. I had arranged to start next morning at six o'clock. Ramleh, where I proposed resting the next night, is but some twelve miles from Jaffa, but Syrian travelling, especially with baggage, is slow, and I had to stop some time at Lydda to take pictures of it. I wished to be at Ramleh, to photograph it too—hence my desire to make an early start.

Before going further, a word or two on Syrian travelling. There was not in all this land, I was told, a *wheeled* conveyance, not even a wheelbarrow, nor perhaps many consecutive miles of road where such could be wheeled. Baggage and goods of every description are conveyed on the backs of mules or camels. The latter go slower, but carry much more than the mules, consequently can carry much larger and heavier packages; and, from being able to do for a long time without water, are alone suited for desert travelling or wherever water is very scarce.

Merchandise being so carried, I need not say we bipeds must either use our own ancient mode of conveyance or mount either the horse, the mule, the camel, or the donkey. Except very timid travellers, who sometimes prefer risking their lives to the tender mercies of the donkey, all who can afford it procure a good Syrian horse—a more or less pure Arab. Those who make a business of

lending horses to travellers have generally got the character of supplying the worst of animals and charging the highest price. I am not much skilled in horseflesh, but presume from anything I saw in Palestine that the horse hirer is there a good deal like his brother-in-trade in this country.

Partly from the badness of the roads, but chiefly from the *acquired habits of the horses and mules*, the rate of travelling is very slow. The average rate set down is three miles an hour, an easy walking pace; and practically I have found the distance actually accomplished under that in nearly every case, though frequently the roads were such as the horses might be raced over. There is no great natural obstacles to the making and keeping of good roads in the country, so far as I could see or learn—not nearly so much as in the highlands of Scotland, I should say. The Turks, I have been told, have a positive objection to good roads: perhaps that is a mistake, and that it is only their *unconquerable* indolence which will not allow them to make such themselves. Of course nobody can make a road but the government, or with its authority. Near Jerusalem the Greek Christians (Russian gold?) have, at their own expense, made some good roads, indicating what might be done if the rulers of Syria were at St. Petersburgh instead of at Stamboul.

Early on the Friday morning my cavalcade was winding its way through the crooked streets of Jaffa, and after three hours' pleasant riding I reached Lydda. The country I found quite level, and the road as good as could be expected, where nothing has been done to *make* it better or worse, but just the track of former passengers left unploughed—here twenty yards there only a few feet, according to the avarice or caprice of the farmer over whose property it passed.

Lud has a thoroughly oriental look. It is on every side surrounded by glorious palm groves—not a tree here and there, as one sees in most parts of Palestine. It would seem that the palm flourishes best near the sea. Whether it requires the saline atmosphere or not, I cannot say. The "sight" of Lud is the Church of St. George, very little of which now remains. St. George—our St. George of England—was born here, it is said; and this church, the ruin of which is the attraction of the place, was erected to mark the spot where so distinguished a saint was born.

I rode round and through the town, and soon fixed on the point from which, with the light I then had, the best picture of the city could be taken. In half an hour I was on my road to Ramleh, which I reached in about forty minutes. I rode at once up to the Latin Convent, where I was to spend the night. I found this convent clean and comfortable, and every one about it very civil. After hurriedly partaking of some refreshment, I set out to look for and take my views of Ramleh. This was a short day's work; but to go to Jerusalem would have been too far.

As the crow flies, Jerusalem is about thirty-three miles from Jaffa; but, from the routeI was compelled to take, it was something less than ten miles more. From Jaffa to Latron, at the base of the hills, is about twenty miles on the map, and being over a level country, a traveller can get over it at any rate he chooses to make his horse go. The last ten or twelve miles, by the map, to Jerusalem is in reality at least twice that distance by the road I was obliged to travel, and cannot be got over in less than six or seven hours, without risking one's neck. In the valleys or wadies (as they are called) the road is generally the water-course, going on the supposition that where there is any water there is little or no travelling. Very wild-looking places I had to pass, and equally wild-looking people I encountered!

Some travellers speak as if they enjoyed travelling in places where there is a spice of danger. I can scarcely say I do so at any time; and in this case I felt very anxious about complete security—to myself, no doubt, first, and after that to my valuable and easily-injured "traps;" therefore, as I could not feel quite safe in traversing those narrow passes where I was informed so many poor pilgrims and travellers had been robbed or murdered, I did not enjoy the grandeur of the scenery—if, indeed, it has any peculiar claim to that characteristic. Besides, to one who has roamed over the hills and wild glens of his native Caledonia, the Syrian wady is too narrow, and the hills have neither height, individuality, or distinctness of character: the hills are a seemingly endless succession of knolls, one over the other.

Passing several Arab villages—which mean a congregation of miserable hovels, quite unfit, according to our notions, for the habitation of the lowest animals—I arrived at Aboo Goosh Kuriet el Enab (the Scriptural Kirjath Jearim), situated right in the centre of the hilly part of our road to Jerusalem, about three or three and a-half hours' riding from the Holy City. There I was told a chief of the robber scoundrels used to hold his court, and woe betide the traveller who dared to pass without first arranging with the blackguard sheik of Aboo Goosh!

My dragoman and guide assured me that the road was then as safe as any in Palestine. To me that was not saying a great deal for it, as I then looked on every native as an unadulterated scoundrel, who would steal my property and shoot me, whenever he had the opportunity. I learned to think better of them and their country, as my readers will see as I advance in my journal.

Aboo Goosh is rather a respectably-built village, and looks well, placed as it is on the brow of a hill. There are the remains of a Christian Church here: it is tolerably entire, though long unused for the purpose for which it was built. Three or four Syrian tinkers were busy mending pots within its sacred walls when I passed! The Church is large and very strongly built, and, though not highly ornamental, is, I should say, chastely elegant in design. It is surely a disgrace that so creditable a specimen of ancient Church architecture should be allowed to remain in such a condition.

I should have said that I developed my pictures of Lydda and Ramleh before I left the Convent at the latter place, and had intended to have prepared plates to use at Aboo Goosh; but I was too tired, and I thought it so near Jerusalem I could go down any day, and return to my quarters in the Holy City in the evening. Having rested before coming up to Kirjath Jearim, I passed on, merely taking an observation how the light fell on it, and determining at what hours it should be photographed.

I had got quite tired of wandering up and down among stones, over break-neck precipices, and up steeps, that at some distance looked like perpendicular walls. All calculation of how long I was to be in getting to Jerusalem had been exceeded; and I was still slowly climbing the nine hundred and ninetieth steep—thinking it but one more, and there would be still another and another—when reaching the summit, I at once saw—JERUSALEM! Now, I am not poetical—I cannot go into ecstacies; but I never can describe what I felt during those few minutes. My horse might have carried me over a yawning gulf—I could see nothing—but before me there was Jerusalem! No word was spoken—there was no expression of joy—but onward we move; and the eye is kept steadily fixed on those grey walls and glistening towers and minarets and domes. That is Jerusalem—the City of our Lord!

"PISTOLGRAM."

"A rose by any other name *won't* smell as sweet."

The following extract from *Punch* is so much in accordance with our own sentiments respecting this truly awful name, that we cannot forbear transferring it:—

"But oh! this mention of one's *poppet* reminds me of a horrible advertisement I've seen, which is headed in big type 'PISTOLGRAMS OF BABIES.' Good gracious, *Mr. Punch!* pray what *ever* is a pistolgram! Is it some new-fangled fire-arm, like an Armstrong breech propeller, and can it be intended really to *go off?* If so, I'm sure *infanticide* will be alarmingly increased, and it will be a mercy if but one out of a dozen of one's babies is not shot. I know I've thought a pop-gun a sadly dangerous thing, and as for those toy rifles one now sees in every nursery, I'm quite sure that it's not safe for children to be left with them; for though CHARLES says they can't be loaded, they've got great bayonets stuck on to them, such as seem made expressly to poke one's baby's eyes out. But what destructive implement a 'pistolgram' may be, I confess I really have not courage to inquire; only I feel *convinced* that if it be *one-half as terrible as its name seems to imply*, our infant population will be dreadfully decreased. I know I'll take good care that nobody shall buy my *ittle tiddleums* a pistolgram, unless I see quite clearly that it can't do any harm; and for my part I can't think why people can't use common English when they want to name a thing, instead of puzzling one with gibberish that no one understands.

* * * * * *

"Yours abruptly, *Mr. Punch*, for *ittle tiddleums is crying*.

"ARABELLA ARAMINTA ANGELINA SMITH."

Record of Photographic Inventions.

By SAMUEL HIGHLEY, F.G.S., F.C.S., &c.

[NOTICE.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

No. III.

DROPPING BOTTLES.

MR. HARDWICH, in the recent edition of his *Manual of Photographic Chemistry*, says:—"The accompanying diagram, *fig.* 1, shows the

best form of dropping bottle, for nitrate of silver, that the writer has seen." This is partially filled with solution: on being inclined air passes in at the wide mouth, and the liquid drops out at the end of the fine-drawn spout. In travelling the larger opening is closed with a stopper, or, better still, a cork, and the end of the spout is capped with a piece of cork or gutta-percha. The palpable objection to such a form of bottle is the risk incurred of the fine projecting spout being fractured whilst on a photographic trip. This instrument has been known to chemists as Schuster's Alkalimeter.

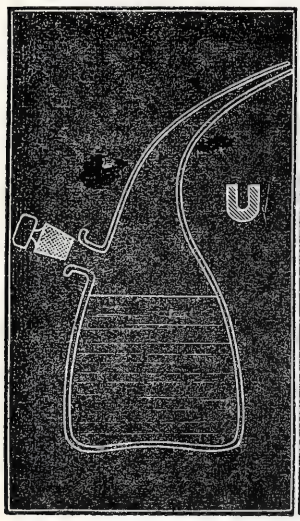


FIG. 1.

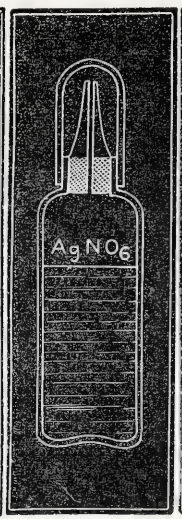


FIG. 3.

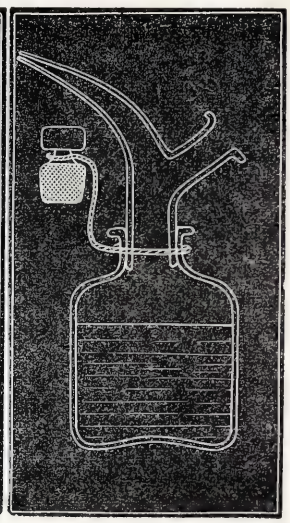


FIG. 2.

A better form of bottle is one that has been sold, for some time past by Messrs. Murray and Heath, shown in *fig.* 2; for in this the fine projecting spout is removable from the neck of the bottle into which it is ground, and may then be replaced by a stopper. The action is the same as in the preceding form. It was introduced for photographic purposes by Mr. Smartt.

I would, however, draw the attention of photographers to a dropping bottle that I have used for some years, which I think is palpably superior to either of these forms, being much more compact in shape, and therefore infinitely less liable to fracture when *en route* or in the field. It consists of a bottle (*fig.* 3) made from glass tubing, stoppered with a piece of barometer tube, drawn out at the upper end to a fine point, which is protected, when not in use, by a glass cap.* The bottle is filled about three-fourths full with solution of nitrate of silver, and then stoppered. When used the bottle is seized with the hollow of the hand, and the point inverted over the measure holding the pyrogallic acid: the warmth of the hand causes the air in the upper end of the bottle to expand, and this acting on the liquid forces it through the capillary tube of the stopper drop by drop. As soon as the action becomes slow the bottle is restored to an upright position, so as to allow a fresh charge of cold air to enter, and, on being again inverted, it begins to act afresh. Originally, this form of bottle was made out of tube, drawn to a capillary point at one end, and capped with gutta-percha; it was then filled by warming the large end of the bottle in the flame of a spirit-lamp and inverting the point in the liquid it was to hold, which was placed in a watch-glass. On removing the flame the liquid rushed into the bottle, and this operation was repeated till it was sufficiently full. As, however, many people unpractised in chemical manipulations generally managed to break their bottles when conducting this operation, I modified the form to that previously described, and drew the attention of microscopists to it in the *Quarterly Journal of Microscopical Science*, Vol. IV., page 286, for 1856. Both myself and my friend, Dr. Lionel Beale, had used this kind of dropping bottle for many years previous, having, as fellow-students, taken our hint from *Beaudant's Mineralogy*. Dr. Beale made his bottles in the shape of bulbs, whilst I made mine in the tube form I have always advocated, whether to be used for chemical, microscopical, photographic, or medical purposes. I may perhaps be allowed to state, whilst speaking of these bottles, that when travelling for any length of time I take with me a little case containing remedies, in a liquid form, for cold, toothache, indigestion, fever, &c.

* These bottles have been made for me, for some years past, by Mr. Eve, glass-worker, of 90½, Holborn Hill, who had several difficulties to surmount in bringing them to perfection, as they are very liable to break in the process of stoppering.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Tuesday evening, the 2nd inst., at eight o'clock, at King's College,—Peter le Neve Foster, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed and declared duly elected members of the Society:—Mr. J. G. Livesay (of Portsmouth), Mr. M. Smith, and Mr. Portbury.

The Chairman felt great pleasure in announcing that M. Claudet had been elected a member of the Council in the place of Mr. Hawkins, who, after being elected, had declined to serve in that capacity.

Dr. Diamond (the Secretary) read a paper, by Mr. Marlow, *On Halation: its True Cause and Remedy* [see page 141], and exhibited several plates sent by that gentleman in illustration of his paper.

The Chairman having called upon Mr. Shadbolt, he, in remarking upon Mr. Marlow's paper, said he recollected an old joke connected with the French Academy, at the time when that body was engaged in drawing up its Dictionary, to the effect that a celebrated naturalist, on entering their room on one occasion, was informed that they had just been describing a crab as "a small red shell-fish which walks backwards;" whereupon he replied that it was a most excellent definition, *with the exception* that it was not a fish, was not red, and did not walk backwards. In somewhat similar language he might say that Mr. Marlow's elaborate paper contained a very good description of and reason for a certain effect—*with the exception*, that what he therein described was not halation at all. The effect described by Mr. Marlow in his paper, and exhibited in his plates, was not that known as halation, but was what might be called *fogging from reflection*. Halation only took place at the line of contact of a high light with a dark object, and it appeared in the form of a fringe extending round the margin of the object and in the direction of the high light; whereas the action described by Mr. Marlow produced an effect exactly the reverse, the fringe extending into the shadow. It therefore appeared to him to be utterly useless to attempt to discuss the subject before them under the name of halation, it not being in any way connected with that phenomenon; but, if Mr. Marlow had called the effect produced on his plates *fogging*, he was perhaps not prepared to differ from him in other respects in any material degree. Another point to which he should wish to direct attention was that, the surface of the glass being coated with iodised collodion, it was impossible, from the yellow tint of the film, for any large amount of actinic rays to pass through the surface and be reflected from the back of the glass. He was sure that any person who had tried to print from a plate from which the iodide had not been removed would support his statement regarding the impediment to light penetrating the glass under such conditions. It further occurred to him that the reflection of the light from the back surface of the glass, as indicated by the diagram on the table, would nearly be at the angle of polarisation, when but few actinic rays would be reflected. Mr. Marlow did not appear to take cognisance of the fact that light was totally reflected from the surface of glass when it fell upon it at an angle something less than forty-five degrees, the angle slightly varying with the density of the glass.

The Chairman asked whether any gentleman could tell him why, if Mr. Marlow's theory were correct, the effects did not always occur? or where they did and where they did not occur?

Mr. Shadbolt said halation usually occurred during exposure in the afternoon, when the sun was very near the horizon, and when the collodion contained organic matter. He had never known true halation occur where the collodion was entirely free from organic matter. They had no means of ascertaining under what circumstances Mr. Marlow exposed his plates, and therefore they could come to no opinion as to what the results produced might be owing.

Dr. Diamond said some of Mr. Marlow's plates had been exposed under a piece of blackened card.

Mr. Shadbolt said in that case any suggestion that the effect was produced by halation fell to the ground.

Dr. Diamond observed that, in the early days of the collodion process, Mr. Archer on one occasion replaced a broken yellow window in his tent with an iodised collodion plate, which proved sufficiently yellow to prevent any light from passing or injuring the plates he was operating on.

Mr. Malone certainly was not prepared to call the effect shown by Mr. Marlow's glass plates "halation," although on the other hand he could not say that it might not be due to the same cause as halation. What he meant by halation was a dark fringe surrounding a light object at its junction with a half-tint, which was exactly the reverse of the case as defined by Mr. Shadbolt. He had some idea that the effect Mr. Marlow had described was caused by red or yellow rays falling upon the background; and he was more inclined to take that view in consequence of some remarks made to him that evening by Mr. De la Rue upon the subject, and who put into his hands a diagram nearly but not quite agreeing with that accompanying Mr. Marlow's paper. Mr. De la Rue understood the author of the paper to say that rays of light were repeatedly reflected backwards and forwards between the surfaces of the glass, each reflection, although fainter than the preceding one, giving a decided action on the film. That was the case where ordinary glass was used;

but if yellow glass were substituted no such effect took place, the yellow medium depriving the light, even when reflected, of any photogenic power. The same result would be given where the light passed through a collodion film, and was then reflected from the back of the glass on to the under surface of the film, viz., the light would have lost all its photogenic action, the film acting as a yellow medium: where black varnish was used no light, at least none that would produce any action, would be reflected. He considered that the point required careful consideration; and he thought it was just possible the true explanation of the effect might be such as was given in the paper they had heard read that night. He might observe that, some years since, he left an ordinary plate exposed opposite a white statue, which, by the reversed action of light, produced a positive instead of a negative—showing that too much light acted in a contrary way to a smaller amount, and that the developer then deposited upon the shadows instead of the light. In the case he referred to the over-exposure had destroyed the usual negative effect in the lights, but had produced it in the shadows. In the case of a glossy object sending back the light very strongly, it was just possible in certain cases that the extra amount of light produced a destructive action, and so gave rise to a reversed effect.

Dr. Diamond recollected taking a picture of a friend's servant who had a very glossy hat on, and not only was the hat fringed, but the edges of his dress also appeared fringed as if with silver lace. The person operated on was standing against a dark background.

Mr. Malone said that, in that case, instead of the action of light being reversed, it was simply increased.

Mr. Shadbolt remarked that before attempting an explanation of any phenomenon, it was desirable to settle definitely what really was under discussion, and proceeded to define, by aid of the black-board, what was generally understood as halation, so as to enable the members to keep in view the nature of the several kinds of phenomena under discussion.

Mr. Eliot asked to what the appearance so frequently seen around the windows of interiors was to be attributed.

Mr. Shadbolt replied that the proper name for that effect was "*fogging*," and not "*halation*."

Mr. Eliot said that was the defect Mr. Marlow sought to cure by putting black varnish on the back of the glass. It was very useful to know of such a remedy, as in photographing windows in cathedrals they were often surrounded by that description of haziness.

Dr. Diamond said that appearance was very common in over-exposed calotype pictures.

The thanks of the meeting were then awarded to Mr. Marlow for his paper.

Mr. Eliot proceeded to describe a portable dark tent and a binocular stereoscopic camera. The tent was formed by placing four uprights in the corners of the box that carried the apparatus required in the field. To the top of these four other rods were fitted, so as to form an over-hanging framework, over which the usual covering was stretched,—the proportions being about four feet square by five feet high. The plate stock box formed the seat for the operator. The bath was placed within the box so as to be on a level with the sink that fitted into the top of the packing box. When all things were packed up the box was dropped upon an axle carrying a pair of small wheels, and the tripod stand being strapped to the box served as a handle by which the whole of the traps could be pushed before the perambulating photographer. The camera was similar to that described as Mr. Sedgefield's, at page 352 of our last volume, in Letters to a Photographic Friend.

Mr. Malone said that as the subject was before them he might be allowed to make a remark upon tents in general. A pupil of his who went to Lima, in South America, had complained greatly of dust getting in under the cover of his tent, and he thought that in all dusty climates it would be preferable to use dark boxes instead of tents, as thereby the annoyance would be obviated. He did not exactly approve of Mr. Eliot's camera, as, in his opinion, the two sets of lenses were not capable of being removed sufficiently apart for taking stereoscopic pictures of objects at a great distance. For instance: a church spire on the horizon, taken with lenses only a few inches apart, would not appear solid, but would look like a piece of cardboard stuck against the sky. It was sometimes necessary to have the lenses three feet apart in order to get a stereoscopic effect; and there was no royal road by which the effect could be produced any other way.

Mr. Eliot said that if the lenses were separated too much the near objects would appear altogether out of proportion with the rest of the picture. He found six inches between the lenses sufficient to produce a good effect.

A vote of thanks to Mr. Eliot for his explanation of his tent, &c., was then passed.

The proceedings terminated with the usual vote of thanks to the chairman.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The Annual Meeting of the Association was held at Eight o'clock on Wednesday Evening, the 27th ultimo, at Myddleton Hall, Upper-street, Islington,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. John Barnett (the secretary) read the following letter from Mr. J. Cramb, of Glasgow, in reference to the late discussion on the use of the hydrometer in testing silver baths:—

67, West Nile Street,
Glasgow, March 23, 1861.

Dear Sir,

I am anxious to offer a few words of explanation through you to the members of the North London Photographic Association, regarding the hydrometer silver meter question. It would be difficult for me to risk entering at any length on that subject, without endangering further my own peace of mind and that of those for whom I entertain the highest respect, notwithstanding that we have taken a different view of a matter which has, no doubt, two sides. I merely wish in this note to disclaim distinctly any *intention* to give offence, or any *expectation* that anything I was doing was calculated to do so; and I feel no difficulty in expressing the most sincere regret that anything I have written should have had an effect I never contemplated.

On the treatment I have received I make no further remark than that I leave it to the gentlemen who have animadverted on *me* and my conduct to do as to them seems just and honourable.

My views on the merits—as a lawyer would phrase it—are unchanged.

You will perhaps be kind enough to read this at your first meeting. By so doing, you will oblige,

Your most obedient
And humble servant,

J. Barnett, Esq., Hon-Sec., JOHN CRAMB.
North London Photographic Association.

The Chairman said that, when an unintentional offence had been given (or even an intentional one), and every possible atonement made, it would be ungracious and unreasonable not at once to let the matter drop—and immediately proceeded to read a paper by Mr. Glover, *On the Resin Process* [see page 125], and exhibited specimens of the failures, as well as the successes, of that gentleman. He also exhibited a specimen by the same process, executed by Mr. C. Corey, which in his eyes gave some promise of success, although it had the appearance of being under-exposed. Mr. Glover had also sent several prints, as a present to their portfolio. He (the chairman) had brought several bottles of resinized collodion which he had received from Mr. Charles Jones, of Birkenhead, and which were at the service of those members who felt desirous of experimenting on that process. In answer to Mr. Simpson, he stated that the ordinary resin was used, the purest that could be obtained being selected.

The thanks of the meeting were awarded to Mr. Glover for his paper and contribution to the portfolio.

Mr. Simpson had tried the effect of Canada balsam and Venice turpentine with the wet process, in quantities varying from a quarter of a grain to two grains to the ounce; but he had also found that the addition of the substances he had named caused the film to adhere with greater tenacity to the glass. His experiments had been conducted for the purpose of determining the effect of various kinds of organic matter on the collodion. He found no perceptible difference until he had added two grains, when white spots began to appear. He had not tried it with the dry process.

Mr. Hill said it was very important to ascertain whether the continued use of resin would not spoil the nitrate bath.

Mr. Simpson had not found it injure the bath, although he had used the process with some scores of plates.

The Chairman on first hearing of the resin process by the Abbé Despretz had added amber varnish, instead of the resin, to the collodion, with the view of ascertaining its effects when treated in the same manner. He found the plates very apt to spot, and that the film, after washing, became powdery. He had also experimented with camphor, but had found it highly unsatisfactory.

Mr. Hill had used amber varnish for the same purpose, but, although he had obtained respectable pictures, he had given it up from a fear of spoiling his bath.

Mr. Simpson, who had also used camphor, had found that it had a tendency to cause the film to become powdery, and to create opacity in the shadows.

The Chairman read a paper from Dr. Maddox, an old member of the society, *On the Singular Appearance presented by two Negatives taken by the Wet Process.* [See page 125.]

Mr. Hill had found portions of some of his negatives present the appearance of transmitted positives, which he attributed to splashes of hyposulphite of soda falling on the plate just before it was developed. He could always produce a similar effect by adding hyposulphite of soda to the developing solution.

Mr. Moens said similar effects had been produced in a case where the bath was made from water obtained from a steam-engine condenser.

Mr. Dawson said a transmitted positive was likely to be produced when an iron developed negative was being strengthened by pyrogallic acid.

Mr. Foxlee thought that light falling upon the negative before the development was completed would also produce such a result. He believed, however, that it was only where an old bath was used that such an effect would be produced.

The Chairman said that about three years ago Mr. Rippingham had exhibited at the London Photographic Society a similar effect in a negative, occasioned by slightly developing the picture, exposing it to diffused light, and then completing the development.

Mr. Simpson observed that method was somewhat similar to the one M. Sabatier, a French gentleman, had lately re-discovered.

Mr. Reiner thought the effect was produced by pouring on the developing solution too violently on one spot.

The Chairman noticed a trifling inaccuracy in the paper. The collodion used was described as a bromo-iodised one, composed of iodide of potas-

sium, holding bromide of silver in solution. Now, bromide of silver was not soluble in iodide of potassium, but was converted into iodide of silver.

A vote of thanks to Dr. Maddox for his communication was passed.

Mr. Dawson read a paper *On the Testing of Old Collodion Printing Baths* [see page 138], for which he received the thanks of the meeting.

The Secretary read the annual report of the committee, as follows, which was received and adopted with an expression on the part of the members of great satisfaction.

THE ANNUAL REPORT.

In celebrating the fourth anniversary of the North London Photographic Association your Committee cannot forbear expressing no small degree of pleasure at witnessing the rapid advance it is making in the science it was established to promote, and at finding that it is acknowledged in the scientific world as an authority in matters photographic.

Without doubt it is greatly indebted for much of its vitality and strength to several influential and accomplished members:—to the worthy Vice-President, who, always at his post, has laboured most energetically for its prosperity; to Mr. George Dawson, for the elaborate and delicate chemical experiments he has undertaken on its behalf; and to other gentlemen who, by the papers they have read and the valuable information they have imparted in the various discussions at the meetings, have contributed so largely to the present gratifying position of the Association. The Committee acknowledges the kind services of all, and thanks them for their disinterested labours in the cause of photgraphic art.

The valuable addition of seven large photographic gems by Mr. F. Bedford, and the promise of a selection of unique floral photographs, by Mr. G. R. Mainwaring, to the portfolio of the Association have induced the Committee to entertain the suggestion of the Treasurer, "that an album be provided, to circulate amongst the members in the same manner as the portfolio;" and, in according its thanks to those gentlemen, hopes that other members may be induced to follow their excellent example, as the circulation of a valuable collection of photographs cannot fail to implant or encourage a predilection for the practice of the art.

It has long been the desire of your Committee to increase the friendly ties already existing between the surrounding Photographic Societies and this Association, and desires it to be generally known that members of other societies will be most cordially welcomed at all its meetings, on producing their card of membership.

The financial state of the Association is satisfactory: the income has exceeded the expenditure by a small amount.

The number of members belonging to the Association for the past year was seventy-eight, and we have a list of fourteen for election this evening, which, considering that besides the parent society there are two other suburban ones connected with the metropolis, cannot but be regarded as highly gratifying.

In conclusion, the Committee feels that it has done its best to promote the interests of the members, and, in resigning its trust, congratulates them on the still increasing prosperity of the Association.

The Treasurer in Account with the North London Photographic Association.

Dr.	£	s.	d.	Cr.	£	s.	d.
To Balance from last year.....	8	17	11	By Journals, Presentation Photographs, Rent, Printing, Stationery, &c.	34	2	5
Subscriptions	36	15	0	Balance in hand	11	10	6
	£45	12	11		£45	12	11

Audited 27th March, 1861.
(Signed) D. BINGHAM,
E. W. FOXLEE.

A vote of thanks was passed to the Vice-President, Treasurer, Honorary Secretary, and Committee for the energetic manner in which they had conducted the business of the society during the past year.

The business of the annual election of the officers of the Association for the ensuing year was then proceeded with.

Mr. Hughes rose, pursuant to notice, to move that the number of the committee, limited by their 5th rule to six, should be increased to eight. He thought such an alteration would be beneficial to the interests of the Association, by infusing fresh blood into its management.

The motion having been seconded by Mr. Dawson, was carried unanimously.

Mr. Hughes, Mr. Dawson, and other gentlemen, made some jocular observations on the advisability of determining, before the next annual meeting, as to the propriety of following the practice of many scientific societies of more frequently changing the gentlemen that filled the office of president and of increasing the number of vice-presidents, they brought the subject forward on the occasion, as it would give the members of the Association twelve months to think over the matter, and to ventilate the question.

The following gentlemen were then duly elected officers of the Association for the forthcoming year:—

President—Charles Woodward, Esq., F.R.S., &c.
Vice-President—George Shadbolt, Esq.
Treasurer—D. W. Hill, Esq.
Hon. Secretary—John Barnett, Esq.
Committee.

T. A. Barber,	C. J. Hughes,	W. Shave,
F. Bedford, Jun.,	G. R. Mainwaring,	G. W. Simpson.
G. Dawson,	C. J. Moens,	

The following gentlemen were proposed and declared duly elected members of the Association:—Messrs. Henry Morton, Samuel Evershed, T. M. Mackie, John Louch, Samuel Mason, A. H. Bateman, Robert Gordon, R. Ramsay, M. Bradshaw, M. M'Gellivray, Theodore Joyce, Bingham Smith, R. H. Dickinson, and C. Marsh Denison.

The Chairman expressed his pleasure to find that, by the addition of the 14 new members that night, their number was now increased to 84. He begged to present the portfolio of the Association with four prints.

The proceedings terminated with the usual vote of thanks to the Vice-President, for his services in the chair.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The sixth meeting of the fifth session of this Society was held in George Street Hall, on the evening of the 9th instant. The chair was occupied by Sir David Brewster, President of the Society.

After the minutes had been read and approved of, Sir David Brewster delivered an address

On M. Claudet's Discoveries in Photography.

The requisite talent and faculty of original research (he said) were seldom combined with the mechanical skill in manipulation required in the complete artist; but both these qualifications were possessed by M. Claudet, to whom the Society had awarded its medal for the best portrait in the late Exhibition. He intended briefly to lay before them a few of the inventions and discoveries by which M. Claudet had achieved that high reputation which he enjoyed in the photographic art.

When an art had arrived at such a degree of perfection and popularity as to be an object of interest to every class of society, it would be useful to retrace the steps by which it had advanced to its present position, and do honour to the men by whom it had been advanced.

After referring to the researches of a Protestant minister in Geneva, he said it was to Mr. Josiah Wedgwood that they owed the taking of portraits and landscapes in the camera. His portraits were only white profiles the size of life, and his images in the camera were too faint to print from. His photographs were merely negatives, from which he could not take positives.

Wedgwood's experiments seemed to have been unknown in France, in which place two ingenious individuals—Daguerre and Niepce—discovered different modes of fixing the image of the camera obscura. The result of their joint researches was the discovery of the Daguerreotype, the principles and practice of which M. Claudet had done more than any other man to elucidate. In Daguerre's time an exposure of ten minutes was required to take a portrait; but in 1841 M. Claudet discovered a way by which the sensibility of the plate was so much accelerated as to admit of a portrait being taken in a few seconds. This he accomplished by the use of chloride of iodine.

After alluding to other experiments by M. Claudet, he said that, next in importance to improving the sensibility of the plate on which the picture was received, was his perfecting the image in the camera. He found that not only were the chemical and visual foci of simple lenses different from each other, but also that, owing to the over-correction or imperfect construction of many achromatic lenses, many of the extremely refrangible and actively actinic, although almost invisible, rays did not come to a focus at the same point the others did; and, in order to test the exact distance between the visual and chemical foci, M. Claudet had invented the "focimeter." He invented another instrument for measuring the intensity of object glasses; and in 1843 he communicated to the Royal Society a valuable paper on the stereoscope.

In a brief sketch like the present, it was impossible to give a full account of the various improvements M. Claudet had effected in photography; but one of his inventions was so remarkable that he could not pass it by without special notice. In 1857 he contributed a paper *On the Phenomenon of Relief in the Image formed on the Ground Glass of the Camera*, and founded on this an instrument which he called the "stereomonoscope." He (Sir David) had never seen that interesting experiment, but he trusted that M. Claudet would some day indulge the Society with a sight of that instrument.

While he had devoted much of his time to the theory of photography, he had not been unmindful of the practical department of the art at the head of which he had placed himself. For his achievements in that department he had been awarded a medal by a jury of the Exhibition of 1851, and subsequently another by the French Exhibition.

He had already referred to what M. Claudet had done with the Daguerreotype, but it was remarkable that, at the same time when Daguerre and Niepce were occupied in France, Talbot was occupied in Britain experimenting in the same direction; and after the discovery of collodion by Mr. Scott Archer, which bade fair to supersede other processes, M. Claudet had by it produced some choice works—among others that one in the late Exhibition, for which Mr. Ross, who had been appointed by the Council for that purpose, had awarded him the Society's medal. In that award Mr. Ross said he had had some difficulty, for there were many fine portraits by Tunny, Moffat, Orange, and others; but on the whole he had thought the one by M. Claudet, alluded to, most deserving of that honour.

Sir David Brewster then tendered the medal to M. Claudet, who briefly returned thanks.

Mr. John Cramb, of Glasgow, then read a communication *On the Albumen Process.*

As Mr. Cramb disclaimed any particular novelty in this process, and detailed at considerable length the minutiæ of his working, we deem it better to allow it to stand over until next month, when we will publish it in full—and this the rather that his paper was somewhat long.

At the close of his paper a vote of thanks was proposed to Mr. Cramb by Mr. Tunny, who paid a graceful and well-merited compliment to Messrs. Ross and Thompson, of Edinburgh, for the *chef d'œuvres* they had taken by the albumen process.

Mr. Cramb exhibited a portfolio of prints taken by the process. These were very beautiful and sharp, and appeared to be much admired.

After a vote of thanks to the Chairman the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The usual fortnightly meeting of this Society was held in the Library, Queen Street Hall, on Wednesday evening, the 3rd instant. The chair was occupied by Mr. J. D. Marwick, President of the Society.

The following gentlemen were balloted for, and admitted as members of the Society:—Bailies Blackadder and Auchie; Dean of Guild Mossman; Councillor Falshaw; Dr. Easton; Messrs. David Millar Latta; Robert Paterson, architect; A. B. Walker; William Cuthbertson; R. H. Bow, C.E.; Robert S. Lain; William Elgin; Richard G. Muir; Alexander Auchie (Clydesdale Bank); George Watson; R. M. Cameron; Thomas Johnstone; William Crawford, A.R.S.A.; Soter Drelenkeiweig.

The Secretary stated that, feeling the necessity of adopting some one of the various photographic serials as the official organ of the Society, he had, with the concurrence of the Council, written to Mr. Shadbolt, the editor of The British Journal of Photography, stating their selection of that Journal, provided he was agreeable to the arrangements. In reply to that letter the Secretary had received the following communication from Mr. Shadbolt:—

2, Upper Hornsey Rise, London, N., 29*th March*, 1861.

Dear Sir,—Permit me to thank you for your kind intimation relative to the selection and appointment of The British Journal of Photography as the "official organ" of the Edinburgh Photographic Society—an honour that possesses double value from its having emanated spontaneously. I desire to offer my warm congratulations upon the very marked success that has attended the establishment of a society which I trust and feel assured is destined to run a long career of usefulness; and I beg to assure you that no efforts of mine shall be wanting to promote its welfare in any way that legitimately lies within my province.—I am, dear sir, sincerely yours,

GEORGE SHADBOLT, Editor.

J. T. Taylor, Esq.,
Hon. Sec. Edinburgh Photographic Society.

Mr. Shadbolt's letter was received with applause.

The President said that the last number of the Journal in question was the first he had seen; but he was very much struck by the variety of its contents and its general excellence. The articles seemed to be of a very high class indeed; and he could not but feel that in being allowed to insert their transactions in its columns they had secured a great boon to the Society.

A paper *On the Fothergill Process* was then read by Mr. Archibald Burns. [See page 144.]

On the table were a considerable number of stereographs, taken by Mr. Burns, illustrating the capabilities of the process in question. They were characterised by several members as being among the finest they had ever seen.

At the close of his paper, Mr. Burns showed the various manipulations by coating and exciting a plate. He then printed a transparency by the gas, and developed it with great success.

Mr. Slight wished to ask Mr. Burns what was the advantage of using distilled water in the various washings? He had hitherto used common water himself, and yet he had obtained excellent results. Also, what harm *heat* did when drying the plates?

Mr. Burns thought that in using common water there were little particles in it which damaged the sky, by causing minute holes. With respect to drying at the fire he thought it made the film very much harder, and rendered it more difficult to develop.

Mr. Slight asked if he had ever seen stains on the plate when it was dried spontaneously? On some occasions when he had dried by the fire he had seen marbled stains, which he thought might have arisen from the use of common water.

Dr. Easton thought the salts which common water contained might possibly account for the stains alluded to.

Mr. Nicol said that the pictures which Mr. Burns had laid on the table bore ample evidence of his success with the process he had so lucidly described. For that success, however, he was as much indebted to the care with which he manipulated as to any particular modification he adopted. It was his belief that Mr. Burns would succeed with any dry process. With reference to Mr. Slight's question, regarding drying by artificial heat, he (Mr. Nicol) thought that between that and what was called spontaneous drying was merely a question of degree, and the result of many experiments led him to believe that the photographic qualities of plates were much the same whether dried at 50 degrees or 212 degrees. It was not the *quantity* but the *irregular application of heat* which should be avoided. In the crystallisation of salts it was well known that the size of the crystals depended upon the temperature at which the solution was evaporated; and although they were not then dealing with a crystalline surface, it was possible that some such modification of structure might take place. For that reason it was objectionable to dry before a fire, as the fingers got hot, and the plate was moved backwards and forwards, producing irregular or patchy drying, which might be the cause of the family of mottlings and markings so much and so bitterly complained of. It was occasionally very desirable to dry by artificial heat. He had very decided recollections of more than once beginning to prepare a dozen of plates after ten o'clock at night, and of the weary waiting—which not even the solacing influence of a pipe could make pleasant—till they were dry. In preparing large quantities of plates for sale—which his firm had frequently to do—they dried them very rapidly by a simple plan, which consisted of a frame of wood, something like a bird's cage without wires, standing in the ordinary hot water or steam-tray used for waxing paper. Two inches from the bottom of the frame there were slips of glass on which blotting paper was laid. On that the plates stood and leaned on glass rods, resting on cross pieces of wood, which were made to move up and down to suit any size of plate. A Bunsen burner was lighted below the dish, and when the water boiled the plates dried rapidly. A cloth thrown over all would exclude the light of the room.

A Member asked concerning the propriety of putting plates in the camera slide while wet, and allowing them to dry there.

Mr. Nicol said it was decidedly injurious; for if the slide were well made it would prevent evaporation and hopelessly spoil them. Some time ago he had three dozen plates sent after him to the Trossachs. They had been put wet into the boxes, and two days after, on opening them, they were dry at the corners and still wet in the middle. They were slowly dried before a fire and exposed, and on development every one of them showed circular marblings in the centre, and were in consequence useless. Probably had they been thoroughly moistened, and dried equally, those marblings would not have occurred.

Dr. Easton remarked that it was now a matter of experiment to determine whether drying spontaneously or by artificial heat was the better plan, and he for one would lose no time in trying the experiment. He had found it to be a good plan for drying plates to set them up in a small trunk, inside of which was a stone bottle, filled with boiling water. By doing this they might have their plates dried and ready for use in ten minutes after they were coated.

Mr. Walker said he had one day prepared a lot of plates, and while still wet he had put them by in the plate-box, in the bottom of which he had previously placed a few thicknesses of blotting-paper. The plates so dried were perfectly successful.

Mr. Burns said that the room in which he prepared his plates had usually a temperature of sixty degrees Fahrenheit, and the plates dried in a short time.

A vote of thanks was tendered to Mr. Burns for his paper, and the Secretary announced the paper for the next meeting to be *On The Wet Collodion Process*, by Mr. Nicol.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting was held on Wednesday, the 3rd instant, —Mr. Parry in the chair.

The Secretary stated that he had with much regret to announce the unavoidable absence of Mr. Sidebotham, whose paper, read at the last meeting, was now to be discussed; and he was sure he should enlist for him the sympathy of his brother members when he informed them that severe illness in his family was the cause of his not being among them. Mr. Brothers had, he believed, come with some results of experiments made with Mr. Sidebotham's stop, and these he would then explain.

Mr. Brothers said it would be recollected that, at the last meeting, he had contended that in taking portraits with a good lens, furnished with the ordinary circular stop, there would not be any distortion of the character spoken of by Mr. Sidebotham; and he begged to lay before them four photographs in support of that opinion. The subject was a bust, in which a flowing beard stood out from the pedestal; and this constituted an admirable test, for of course it would at once show whether the ordinary lens gave rise to a stereoscopic effect not produced by the new stop. The photographs were about one-third the size of the original—the first being taken with the stop with which he usually worked; the second with the full aperture of the lens; the third with Mr. Sidebotham's stop; and the fourth with a similar slit placed vertically. He invited the members to examine these carefully, and he believed they would say with him that no difference could be detected as regards the stereoscopic effect. The beard he had alluded to would prove this; for it would be found to extend to exactly the same point on the pedestal in all the copies. It was possible there might be some minute difference, but the eye could not detect it; and he could not therefore conceive it to be a matter of any practical importance. But he found that, on using Mr. Sidebotham's stop, the time of exposure necessary was three times that which he required when using the ordinary arrangement; and it consequently appeared to him that he should, without gaining anything of importance, lose considerably. Another defect, however, would be observed, and it was in order to show this that the fourth negative was taken with a vertical slit. On examining the pictures it would be observed that in both cases where the elongated stop was employed there was a drawing of the lines in the direction of that elongation, they being blurred horizontally when Mr. Sidebotham's stop was used and vertically with the vertical stop.

The photographs exhibited by Mr. Brothers were examined by the members, and a general opinion prevailed that no difference existed which the eye could perceive. It was, however, thought that further experiments should be made, as the subject then before them was scarcely distinct enough in lines to test the principle.

Mr. Heywood suggested that the best object would be a projecting block placed upon a sheet of ruled paper. It would then be seen at once whether the projecting part covered more lines in one case than in the other.

Several members having expressed their intention of making experimental trials, the further discussion of the subject was postponed until the next meeting, when it was hoped that Mr. Sidebotham would be present.

Mr. M. Noton then read the following

Memorandum on the use of Rectangular Stops.

On the afternoon of Saturday, the 30th ult., I went out with my stereoscopic camera and one plate, to try the effect, if any, of using rectangular stops.

The object I selected for experiment was an engine chimney about fifty yards in height, distant from the camera about eighty or ninety yards, with a fence between us distant about six or seven yards.

In front of the right-hand lens I fixed the stop vertical; the left, horizontal, or at right angles with the former.

I then focussed the chimney on the right-hand side of the ground glass, leaving the left hand to take care of itself, as in ordinary usage it would have been equally sharp, which I have proved in hundreds of cases before.

A cold wind was blowing, the light very poor, and likely to rain soon, which caused me to cease working earlier than I intended.

I could see the trees and the camera legs moving, and it seemed very doubtful whether I should get anything but disappointment.

The result after development was better than I expected, showing a considerable difference between the two impressions.

The right-hand picture's outlines are tolerably sharp (considering the wind), the trees being as good as the chimney. There is very little half-tone, as I expected.

On the left-hand half of the plate the chimney is very deficient in outline and much slenderer, the vertical lines being scarcely discernible: the brickwork has been trying to come out, but has got into a state of confusion.

The trees surprise me the most. The trunks and branches have more half-tone, the outer edges being sharp; the inner ones, or those towards the centre of this picture, being shaded off, giving a rounder appearance, more like coral, and has quite a stereoscopic tendency, I think.

I beg to lay the plate before the Society ,and may say that, if we had not had nearly constant rain since our last meeting, I should have been able to have produced others.

Mr. Brothers said it was very singular that the paper they had just heard read by Mr. Noton should bear so directly upon the remarks he had made on Mr. Sidebotham's stop. On looking at the negative taken by Mr. Noton, precisely the effect he had pointed out, of a drawing of the lines in the direction of the slit, would be perceived—the blurring up the chimney with the vertical stop and across it with the horizontal stop being most marked. He requested Mr. Noton to continue his experiments and to take two pictures—the one with the usual round stop and the other with a vertical slit.

Mr. Hebert then exhibited an automatic washing machine of his own contrivance, in which a valve being acted upon by two floats was caused to open and close periodically, so as to ensure a change of water. The photographs to be washed were placed in trays formed of wooden lattice-work.

The proceedings were brought to a conclusion by votes of thanks to Messrs. Brothers, Noton, and Hebert for their communications, and the Chairman for his services.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The Annual Meeting was held on Wednesday last, the 10th instant,—Mr. Griffiths occupying the chair.

The minutes of the last meeting were read and confirmed, when the Chairman read the following annual report of the Council:—

ANNUAL REPORT.

In laying before the members this, the Fourth Annual Report, your Council must, in the first place, express their satisfaction at the continued prosperity and usefulness of the Society.

They have great pleasure in referring to its financial position, as shown by the treasurer's account, which, as in previous years, continues to show that the income has rather more than equalled the expenditure. This is more than they could have reasonably expected, considering the smallness of the annual subscription, and the slightly diminished number of members; and is, they think, a satisfactory proof that everything has been managed with the strictest regard to economy.

This desirable result has not, however, they believe, been obtained by restricting to any material extent the objects of the Society. It is true that, with the command of larger funds, more could be undertaken in the interest of the members than has hitherto been.

It was with that object the resolution to advance the subscription was proposed at the last meeting, Your acceding to this unanimously caused great satisfaction to your Council, showing as it did that the sympathies of the members with the objects of the Society were not dead, as some had supposed, but only required a suitable stimulus to awaken them from the lethargic slumbers into which they had fallen.

The progress made by photography towards perfection during the past year may not satisfy all the wishes of the more sanguine lovers of our art; but such as it has been is matter for congratulation, inasmuch as its course is ONWARD! and points to a future (let us hope not far distant) when most if not all our desires for its complete success will be gratified.

To the establishment of photographic societies we are mainly indebted for its present comparatively advanced condition. They have proved a stimulus to investigation to vast numbers of minds whose energies might else have remained undeveloped, and by the laudable spirit of emulation, ever attendant upon the free interchange of thought and opinion, have excited in many of their members a worthy desire to outstrip their fellows in their efforts to accelerate its further progress.

Our own Society, occupying a position comparatively insignificant in relation to some of the older associations, has not, your Council submit, been without its measure of usefulness as well as profit, at least to its own individual members. And although the number of papers read exhibit a falling off compared with previous years, they are sanguine in their belief that the majority have largely profited by the valuable and practical information elicited at the prolonged discussions which have taken place at all their meetings.

A recapitulation of the proceedings during the year is presented as required by the rules.

April 11, 1860.—Election of officers and annual report tread. Mr. Griffiths's paper *On a New Dry Collodion Process.* Discussion introduced by Mr. Hooper on the Fothergill Process.

May 9.—Discussion on Mr. Griffiths's paper. Communication by Mr. Fawcett *On Taking Pictures by Artificial Light.*

June 13.—Exhibition of the artificial light used by Mr. Fawcett, and discussion thereon.

June 16.—Extra meeting held at the Photographic Exhibition Rooms, Peel Park Museum.

Sept. 12.—Address of the Vice-President. Communication by Mr. Hooper *On a New Negative Albumenised Paper Process.* Discussion on Dr. Hill Norris's extra sensitive plates, and on Messrs. Petschler and Mann's process.

Oct. 10.—Communication by Mr. Sheard *On Mr. Parry's Hot Water Process;* and also *On some New Facts concerning the Sensibility of Plates coated with Chlorised Albumen.*

Nov. 14.—Mr. Griffiths's paper *On Iodo-Nitrate of Silver—Its Photographic Properties;* and also *On the Chemical Effect of Free Iodine in Collodion.* Communication by Mr. Kay *On a New Method of Strengthening Negatives.*

Dec. 12.—Discussion introduced by Mr. Rogerson on the Theory of the Dry Process of Dr. Hill Norris, and on the Sensibility of Iodide of Silver.

Jan. 17, 1861.—Exhibition of members' pictures in the lantern, conducted by Mr. Whaite.

Feb. 13.—Discussion introduced by Mr. Wardley on the production of transparent positives, and on the alkaline gold toning. Communication by Mr. Griffith *On Uranium Printing.*

March 13.—Special meeting. Nomination of officers; alteration of rules; and auditing accounts.

They regret that the average attendance of members has not been more numerous, and that a greater number have not volunteered a more active assistance in carrying out the objects of the Society; but confidently expect that, under the contemplated alteration in the management, this will not be the case in future.

Several important additions and alterations will, in accordance with the resolutions passed at the last meeting, be made to the rules which your Council entertain no doubt will have the effect of greatly increasing the interest felt by every member in the future prosperity and success of the Society,

Before concluding their report they would specially recommend that the best thanks of the Society be given to the Editor and Publisher of the British Journal of Photography, for their courtesy and kindness in inserting the monthly reports of our proceedings in that most valuable and deservedly popular Journal.

It was moved by Mr. Radcliffe, and seconded by Mr. Ward, that the report just read be received, which was carried unanimously.

[Owing to our going to press so soon after the date of the above meeting, the remainder of the proceedings did not reach us in time for publication in this number.]

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

At the monthly meeting of the members of this Society, held on the 26th ult., Mr. Haines presided.

On the motion of Mr. Brown (honorary secretary), Mr. J. Wingrave and Mr. J. Mountfort, of Coventry, were nominated members of the Society.

Some other formal business having been disposed of,

Dr. Anthony, of Birmingham, delivered a *viva voce* address on the subject of *Photographic Lenses*, of which we will give a report in our next number. He illustrated his remarks, which were listened to with the greatest attention, by a succession of cleverly-executed diagrams on the black board.

Mr. Brown (hon. sec.) exhibited three large photographs—two by Bisson Freres, the *West Front of St. Ouen, Rouen*, and the *Maison de Bateliers, Ghent;* and one by Cocke, the *South-East View of Durham Cathedral*—each of them illustrative of certain defects which Dr. Anthony briefly explained. Those of Bisson Freres, though giving even the minutest detail of the architecture, together with great depth and purity of tone, fell off towards the angles of the picture in consequence of the lens not having sufficiently covered the field, the one of Rouen being very much distorted. The *View of Durham Cathedral* showed a central halo, or lens mark, which much marred the effect of an otherwise exquisite print. A copy of a map reduced by Dallmeyer's triplet lens was also laid upon the table, showing the working of the lens, the definition of a 12 by 7 being as perfect to the extremes as the centre. The Secretary stated that he had tested the angles and found them perfectly square and true.

Mr. Brown afterwards proposed a vote of thanks to Dr. Anthony, and suggested the postponement of the discussion on the address until the next meeting, on which occasion he invited Dr. Anthony to attend.

The vote of thanks was cordially passed, and the meeting adjourned until the 30th instant.

BRADFORD PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Wednesday, the 3rd instant, at the rooms, Chapel Houses, James Street,—W. H. Leather, Esq., in the chair.

The minutes of the last meeting having been passed, Mr. Wood was unanimously elected a member of the Society.

The Chairman called upon the committee appointed to try Ross's lens to give a report of their experiments.

Mr. Stanley said a comparative experiment had been made between Ross's and a lens of French manufacture, the results of which were on the table. The exposure of both were alike, but as would be seen, on close examination, there was a great difference in definition—Ross's being a more vigorous picture, with greater depth of focus. It must be remembered that these pictures were taken in the studio.

A Member: Does Mr. Stanley think a better and quicker result by Ross's could be obtained than by the French lens spoken of in operating out of doors, and has any such experiment been made?

Mr. Stanley: It was my intention to have put before you some wet plate negatives this evening, but from the very unfavourable state of the

weather my plans were completely frustrated. I am satisfied, however, that on a bright day, and with wet collodion, an instantaneous result may be obtained by Ross's lens; and if the meeting will spare me the necessity of giving a decisive report until our next meeting I will be prepared to carry my theory into practice.

After some discussion it was unanimously agreed to allow the experiments to be continued until next meeting.

The thanks of the meeting were awarded to Mr. Stanley for exhibiting some exquisite stereoscopic views, taken by the tannin process, and to Mr. Beldon for a view 10 × 8 taken by the same process, clearly showing the superiority of that process; also to Mr. J. M'Landsborough, for presenting a volume of THE BRITISH JOURNAL OF PHOTOGRAPHY to the Society's library.

Mr. HARLAND requested Mr. Beldon to favour the Society by reading a paper at the next meeting on the tannin and Fothergill processes, as his experience in the dry plate process would greatly assist all endeavouring to perfect themselves in this interesting branch of the art.

Mr. BELDON said he should have much pleasure in complying.

After an interesting conversation, and the usual vote of thanks to the Chairman, the meeting separated.

Practical Instructions on Coloring Photographs.

By ALFRED H. WALL.

CHAPTER VIII. *(Continued.)*

WE will say, then, you are now about to paint cloth. Make a glaze of Vandyke brown, lake, and indigo, mixed to a rich warm black, and carry it over the whole: with the same proceed to strengthen the deeper shades. This done, lay in the lights with black, white, and a little blue; and next the intermediate tints with various proportions of black, white, and Venetian red—using the same rather warmer for the reflected lights. With white and black lay in the high lights, and then soften and blend with a dry brush as before described, taking care all the time to preserve the photograph by laying tint for tint and shade for shade. When this first painting is dry you may finish with the same colours, using more medium and repeating the glazings.

And now suppose you are about to paint a scarlet coat. Use for the first glaze cadmium yellow and crimson lake; for the high lights orange vermilion; for the shadows crimson lake and vermilion; and for the intermediate tones vermilion, vermilion and lake, and vermilion and orange vermilion. Soften, and when the first painting is dry finish with the glazing colour (cadmium and lake) and orange vermilion. [See previous remarks on the character of cloth.] In the same way proceed with every other material, using each colour of the exact tone and depth of that it is laid over, and you cannot go wrong.

The whole of the photograph having now received colour, it may be placed aside to dry, in some place perfectly free from dust; and thus ends the first painting.

At this stage the colours should all be bright and clean, but short of their intended force and depth, to allow for the glazings and finishing touches. There should be nothing hard about the lines and markings of the features, and the likeness should be thoroughly preserved.

THE SECOND AND THIRD PAINTINGS.

If the colours have become, in the interval between the last painting and your again commencing, too hard and dry to receive the subsequent painting, you have only to pass over them, first, a damp sponge,* and when the surface is dry, a little poppy oil to make the second colouring unite with the first. After applying the poppy oil it should be gently wiped off with a soft, old silk handkerchief, carefully observing that no dust or threads of the silk adhere to the surface.

Your task in repainting is, first, to strengthen the lights by scumbling. For this purpose you may use white, Naples yellow, and a touch of madder lake; following this with white, yellow ochre, and vermilion, and again with white and light red.

The carnations next claim attention. For these we use madder lake and vermilion, or madder lake and Mars. orange, with or without a little white, according to the complexion to be imitated; or white and Indian red, with a very slight touch of cadmium; or white, raw sienna, and madder lake; and for passages retiring into shadow, white, madder lake, and ultramarine and white, with madder purple.

The greys may next be attended to; and in this branch of our work we shall find all our knowledge and experience put to the test. The tints for the greys are the same as those given under the head of half-tints, in a previous number, mixed to a cool or warm, a greenish or bluish purple, or violaceous tone, according to local requisites, or the peculiar complexion of your sitter. The more transparent of the tints given are the better for this stage of the picture's treatment, and they should be used thin, that is to say, with a good supply of medium.

The half-tints may next be treated with the more transparent tints already given, used thin.

Among the tints incidental to certain passages in various complexions will be found the following:—

Ultramarine and purple lake, with light red and a little white; light red and purple lake, with a little white; burnt sienna, madder lake, and a little white; black-lead, white, and Indian red.

For strengthening the shadows use glazings of—

Indian Red and Madder Brown.
Purple Lake and Vandyke Brown.
Crimson Lake and Vandyke Brown.
Indian Red and Brown Ochre, with a touch of Black.
Burnt Sienna and Purple Lake.
Vandyke Brown and Mars. Orange.

Select from these such as may, by their tone or depth, be most suitable to the end in view. If you find any passages that appear too warm or foxy, such may be corrected by working the following cool tints—either used thin, or by a stipple—over them:—

Terre Verte and White.
Ditto with Rose Madder.
Emerald Green and White.
Cobalt and White.
Cobalt and Naples Yellow.

In applying these tints, it is especially desirable that they should be laid on at once in the right place, and with as few touches as possible. *All the warmth, transparency, brilliancy, and freshness of colours disappear when teased by much working about with the brush.* The brushes themselves must also at this stage be more particularly examined, to see that in applying one tint you do not, in using the same brush, destroy its purity or character by mixture with another.

The reflections also should now be strengthened, and a little pure madder lake applied, as a stipple, to the brighter and deeper passages of the carnations.

Proceeding to the draperies, scumble the highest lights and glaze the deeper shadows; afterwards proceed by scumblings and glazings to improve the background, and then the work may be put aside for the third or

THE FINISHING PAINTING.

The second painting being dry, and the work prepared as before, you have now to bring your picture up to the brilliancy and force of the complete effect by skilful glazings and scumblings—the latter being confined chiefly to the lights.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

ARTHUR E.—The specimen has not yet arrived. Your remarks are taken in perfectly good part, I assure you. Many, I am afraid, think with you; but it seems to me as absurd to argue that, because a man can hear, therefore he must be a good judge of music, as to say, because he can see, therefore he must know whether a picture is good or not. "The eye only sees that which it brings with it the power to see." You do not dance beautifully because you have legs, but because your *mind* has acquired the rudimentary principles of this graceful accomplishment.

CHROMO (No. 2.)—The preparation of the "cream," as Miss Greenland, afterwards Mrs. Hooker, called it, was for a method of incaustic painting which might answer your purpose. It was stated when first announced to be "in imitation of the ancient Grecian manner." I will tell you how to make the composition in the next number, as I have not the time to spare just now.

M. J.—See reply to G. S. and others in the last number but one.

BOTHERED BOB.—I don't wonder at it. You seem to think your paint is plaster and your brush a trowel. Good brushes are not plentiful: I never rely upon any one but myself for making choice of these. Sometimes I get them good from one place and sometimes from another. To clean them, rinse first in spirit of turpentine, and finish in a mixture of poppy oil with a little spirit of turpentine. They may be kept moist by dipping them into olive oil, but be careful to cleanse them from it before use, or your colours will not dry. I won't say anything about the specimen sent: its many faults must be apparent, and you can I am sure do something better worth criticising. Wilkie's first easel was made by pulling out the centre drawer of a chest and sloping his canvas against the upper part. Perhaps the hint may serve you for the large picture you are about.

Foreign Correspondence.

Paris, April 10, 1861.

SOME two years ago an English experimenter, whose name escapes my memory, announced that he had employed paraffin with advan-

* Whenever the glazings will not lie, the sponge must be applied. You may dry, *with care*, by the fire, avoiding placing it too close.

tage in a photographic process which he described. I am not aware whether he followed up the matter or abandoned it; but one of our cleverest amateurs, M. Civiale, has been employing the same substance in the preparation of negative paper as a substitute for wax. The pictures exhibited at the last meeting of the French Society of Photography are very satisfactory, and especially remarkable for their freedom from those little spots which generally cover pictures upon waxed-paper, and give to them what is called a *grainy* appearance. The preparations differ in no respect from those which are usually required for the preparation of waxed-paper. The exposure is the same as for wet collodion, and the development is done with gallic acid.

Paraffin is cheap; it resists the action of most chemical agents; lastly, it gives great transparency to the paper. All this is more than enough to attract the attention of operators.

Some new details on Fargier's process have just been given by the committee charged with the experiments. The proportions are the following:—

Water	100	grammes.
Gelatine	10	„
Bichromate of potash	3	„
Charcoal powder	1	„

After exposure, two coats of collodion slightly acidulated are spread over the picture: the first coat must be thin, the second thicker. The report of the committee is very favourable to the process, which has given good results in the hands of Count Aguado, a member of the committee.

Some attention has been attracted here by the process published in England by M. Belbini, by which the picture may be obtained (so it is said) almost instantaneously, without development, by coating the glass with a solution of shellac and gum sandarac in alcohol and ether, to which are added iodide, bromide, and lactate of silver, and, lastly, iodide of iron. This looks somewhat of a medley, and one naturally inquires how all these agents will agree together. However, we must not be hasty to reject innovations which may, after all, prove to be real improvements, but rather wait for further information.

If one may judge from the preparations that are going on on all sides the season about to commence will be a fruitful one for photographers and photography. Establishments are being organised, and new processes pursued with activity, so that we may hope for a fair abundance of useful and interesting facts.

Nothing official has yet been published with respect to the organisation of photographic instruction in the army. The instruction, however, has already begun. Twenty-five officers are going through a course of lessons at the rooms of Disdéri, under the direction of that gentleman, who has just communicated to me the paper which he presented to the Minister of War, and which is, in fact, his programme. Here is the substance:—

The *matériel* of the army photographer should answer to the following requirements:—It should be light, occupy but a small space, be convenient to move and handle, and, lastly, should be of a moderate price.

The stereoscopic apparatus fulfils these various requirements better than any other. The *matériel* is divided into two portions:—on one side, the apparatus, composed of camera, objective, frames, and pedestal, in a box of 25 centimetres (about 10 inches) each way; on the other side chemical products, funnels, dish, and small utensils, contained in a box of 35 centimetres (about 14 inches). These two boxes, light enough to be carried by a man, could, when necessary, be placed on the back of a mule. The stereoscopic apparatus likewise offers the advantage of supplying several proofs at a time, and of giving the relief of nature. The pictures obtained in campaigning might be amplified at one's leisure, with the help of the proper apparatus. M. Disdéri calculates the price of the equipment necessary for each officer at 400 francs (about £17). He takes his pupils into the various operating-rooms set apart each one for a special operation, so that the instruction may be divided as follows:—1. A preparatory lesson, giving explanation of the operations. 2. Cleaning of the glass and preliminary lesson. 3. Preparation of the sensitive film, development of the picture, and various labours of the laboratory. 4. Pose, study of lights, and reproduction. 5. Different preparations of positive papers. 6. Printing of positive pictures. 7. Fixing. 8. Retouching and mounting of the pictures. 9. Lessons in photographic chemistry. 10. General work—photographic excursions.

This last part should be done with the officer's regulation apparatus.

As to the choice of officers, M. Disdéri proposes that sub-lieutenants and lieutenants should be preferred, as they can follow the lessons more easily, and be taken from their service with the least inconvenience. They should send a certain number of positive pictures from their *clichés* for the collection of the ministry, and for the various libraries and museums. Lastly, an annual special exhibition of the works of army photographers should be instituted, and prizes should be awarded for the most meritorious productions.

Such is, in outline, the programme submitted to the Minister of War, though as yet no decision has been officially announced. Of course this plan needs completion. Practical military men will point out the special applications of the photographic art which are most useful for the army, and will add to the plan those details which their experience shows them to be necessary. The pupils who are already at work manifest a zeal and an aptitude which give good promise for the future.

The French Society of Photography is actively preparing for its exhibition, which is to open on the 1st of May. I have already seen several pictures which are to figure therein, and I have every reason for believing that the Exhibition will be a very interesting one. Amplified pictures will occupy an important place. M. Edouard Delessert, one of our most talented amateurs, will send twelve remarkable specimens, among which will be a carriage, with ponies half the natural size, two full-sized portraits, which will doubtless claim a large share of the attention of visitors. These pictures were obtained with a solar camera having a condenser of seventy-five centimetres (about 30 inches) in diameter. The reflector is moved in any direction by means of a new mechanism. To obviate the inconvenience of the extreme heat produced by a condenser of such power, ventilators have been so arranged that a constant current of cold air falls upon the *cliché*. M. Delessert's apparatus allows pictures to be obtained upon ordinary chlorided paper in thirty-five minutes. This is already a noteworthy progress.

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PHOTOGRAPHIC EXHIBITION OF 1862.

To the EDITOR.

SIR,—The "hint" conveyed in the letter of "A.," in the last Journal, is an excellent one; and I hope you will advocate its adoption, and do your utmost to induce the Photographic Society to act up to it.

Some "*scoffers*" say that photography has reached its ultimatum, and the total absence of all progress in the present Exhibition might *mislead* them to that conclusion; but they would be thoroughly convinced of their mistaken notion when they saw the wonderful display of merit and artistic skill which this suggested friendly rivalry would unquestionably produce.—I am, yours, &c. EVALINE.

[We will certainly advocate the principle for which you contend, and, if needful, personally bring it under the notice of the Council in due time. Want of sufficient space to do justice to the plan may prove an impediment; but the probable advantage appears to us to outweigh the disadvantage of having to reject a few more pictures than usual.—ED.]

STEREOSCOPIC TRANSPARENCIES.

To the EDITOR.

SIR,—In your impression of March 1st, turning to the report of the Blackheath Photographic Society, a good deal is said about stereoscopic transparencies by the albumen process; and Mr. Negretti mentions that, *six years* ago, the process was published in the Journals.

Not having been a photographer so long, I have not seen the description mentioned, but shall be much obliged if you would give me in your next Journal the formula for the best known process for *albumen* plates, both for transparencies and the negative one referred to by Mr. Negretti. I have, for some time past, been printing transparencies from my stereo. negatives by the same dry process by which the negatives are taken (the resin one); and although they are very good, when you can succeed in getting them perfect in the film, the film is so delicate, from its having no horny substance like albumen to protect it, that four plates out of every six get small pin-holes and spots pulled out of the film by the minute uneven points on the face of the negative, especially if the plates get the slightest side motion in being placed in contact or removal after exposure—in addition to which the plates are so sensitive that it is almost impossible to hit the right exposure every time. I think the albumen process referred to would be just the thing for me, as I have some beautiful negatives well adapted for the purpose. I have

never yet tried any process for taking negatives except collodion; but if the albumen one referred to by Mr. Negretti is to be worked without *very* great difficulty, I should like to try it, more especially as he says the negatives are so much better adapted for transparency printing.

Is there any known solution or varnish for pouring over plates to cause the appearance of *ground glass*, instead of putting a sheet of *real ground glass* over the print, as is usually done? If so, I should be very glad to know of it, as I find very great difficulty in getting *very nice fine* ground glass: most of that offered me for sale is such coarse stuff that I would not use it, and prefer paper prints to such a medium. It would be cheaper also to use two sheets of crown glass instead of one of ground glass over the crown glass one with the print on it, as I have been doing, and the slides would not be quite so heavy, which is a consideration when you have 200 or 300 slides in a collection.

I am, yours, &c. AMATEUR.

[You will have noticed that the very same objection which you find to printing upon collodionised glass plates, viz., the production of small spots, pulled out of the film by the necessary contact of the plates, is that to which Mr. Negretti objects in negatives, as being even more injurious. You will find an abstract of Mr. Negretti's paper, detailing M. Ferrier's method of working the albumen process, in the present number.

There are several means of producing the effect of ground glass, one being the use of a spirit varnish that readily "blooms." We believe that a varnish of this kind is made and sold by Mr. Maddison, of Huntingdon (for which see advertisement). Another method is by pouring over the proofs a solution of pure white wax in ether, in the same way as you coat with collodion. By the way, ground glass is usually applied *behind*, not over, the proof. The *ground* glass fit for your purpose is that which we have been told is called "matted"—that is, roughened with hydrofluoric acid; but we know that the right kind can be obtained from either Messrs. Forrest and Co., of Liverpool, or Messrs. Claudet and Houghton, Holborn, London.—Ed.]

REMOVING BLACK VARNISH.

To the Editor.

Sir,—You being, as an Editor, supposed to know everything, and having kindly assisted me with information before, may I trespass on your good nature by asking for advice in the following case:—I possess an over-exposed glass positive portrait, sufficiently dense I believe to use as a negative, but, unfortunately, I finished it as a positive. If I remember rightly I varnished it first with transparent chloroform varnish, and over that with Bates's black varnish, *on the film side*. Can you tell me any way of dissolving off this black varnish cleanly and completely?

I tried with chloroform, which took off the greater part, but left the picture too stained and blackened to print from; and, in despair, I reblackened it with Bates's.

I would go to any moderate expense to make a negative of my picture, and crave your kind advice.

If you cannot tell me what to do, can you mention to me any one who would undertake to do it for me?

I am, yours, &c. W. J. G.

P.S.—Would benzole serve me? I am inclined to think that chloroform would have done if anything would. I value the picture too much to try any dangerous experiment.

[The exact composition of Bates's black varnish is unknown to us, but we have little doubt that benzole will be the proper solvent, as it dissolves asphalte, which is probably one of the chief ingredients; and, if there is any India-rubber in it, benzole will still be suitable. It is possible, however, that your employment of chloroform may have complicated matters by causing a union between the black and the transparent varnishes: still, with care, you may yet manage to preserve your picture and remove the varnish. Soak it in benzole, and get off as much of the Bates's varnish as you can, rubbing it gently, if needful, with a clean tuft of cotton wool. Then proceed in the same manner with turpentine as a solvent, and if any stains remain they will, most likely, have been caused by your treatment with the chloroform: you have, therefore, only to remove what remains as well as you can by flooding the plate with chloroform, and pouring it off, without any rubbing—and, lastly, again varnishing it with transparent varnish. This will probably cause a slight discoloration of the varnish; but, if it is a general one (not in patches), it will merely make it print a little more slowly.—Ed.]

THE NEXT PHOTOGRAPHIC EXHIBITION.

To the Editor.

Sir,—The "hint" thrown out by "A." in your last number, that the pictures in the next Photographic Exhibition should be classified and hung in groups, representing the various societies, is too good simply to find an obscure corner in your Journal and to perish there. I trust that a suggestion so well calculated to stimulate exertion in our common pursuit will meet with the attention it deserves; and, in order to bring it more prominently forward, I beg space in your columns for a few words on the subject.

It is extremely desirable that our Annual Exhibition, which is the chief exponent to the world of the progress we are making, should be rendered as excellent and artistic, year by year, as possible; and, therefore, any new idea which tends directly to this result is worthy of consideration. Photographic manipulation, we may suppose, has almost reached its *maximum*, and the great field for competition does not lie so much in that direction. It is in the higher regions of *art* that photographers must now seek their laurels, and here is certainly ample scope for all friendly rivalry and ambition. It is quite time that the hostile critics who annually peep in at our display should be made to acknowledge, in spite of themselves, that photographers had at last entered the domain of art, and that the works suspended before them, by bearing unmistakeably the impress of thought and refined cultivation, while commanding their admiration should defy their prejudiced criticism. "A.'s" suggestion, if properly carried out, I believe, would greatly tend to promote this result, inasmuch as we should all wish to see the particular society with which we may be connected first on the list, thereby creating a stimulus which must be productive of marked and rapid progress. But, in order that this effect may be secured, it is not only necessary that this suggestion be adopted, but that it be *proclaimed at once*, before the season for work begins. I would therefore suggest that, at the forthcoming meetings of the North London and South London Societies, the subject be introduced, and, if approved of, that competent gentlemen be appointed to bring the matter before the Photographic Society at its meeting in May. That conservative body, which generally treats with considerable neglect any suggested alteration of its (I was going to say stereotyped) movements, might thus be brought to give its sanction to this slight, but important, modification of its Exhibition arrangements. Perhaps, Mr. Editor, if this suggestion commends itself to your judgment, you would not think it too much trouble—in your interest for the art's advancement—to bring it forward yourself; and, if so influential an advocate can thus be secured, I, at least, have no doubt of its becoming a *fait accompli*.—I am, yours, &c.,

PROGRESS.

[We have already pronounced in favour of the suggestion. As regards our opinion, we are quite ready to advocate its adoption as proposed; but we are not sanguine about the possibility of its being carried out in the small Gallery hitherto occupied. *Nous verrons!*—Ed.]

MOUNTING STEREOGRAPHS.

To the Editor.

Sir,—Would you kindly inform me what rule ought to be observed in mounting the two halves of a stereograph when taken on the Latimer Clarke's system of moving the camera? I am at a loss to know what distance the two halves should be from each other. In 177, *On the Rothay, near Rydal* (Ogle and Edge), the distance from any one point is $2\frac{7}{8}$ inches. In a stereograph, *Beautiful in Death*, it is only $2\frac{5}{8}$ inches. In a view of Paris, Notre Dame on the right, it is less than $2\frac{1}{2}$ inches. In a picture of a seashore, with boats, it is less than $2\frac{1}{4}$. There is thus a difference of three quarters of an inch. Which is correct? An answer will oblige.—I am, yours, &c., SIGMA.

Warrington, April 6, 1861.

[Our correspondent has committed an error in saying that the distance between *any* corresponding points in either pair of stereographs is a fixed quantity, near objects being closer together than distant ones. There is a very wide latitude admissible in mounting the two halves; but, in order to get the best effect, the distance between corresponding points of *the most distant object* should be such that, when viewed in the stereoscope, the optic axes of the observer should be very nearly parallel. If entire lenses are in use in the stereoscope this distance will be on the average about $2\frac{1}{2}$ inches; but, if prisms or semi-lenses are in use, *owing to their lateral displacement of the rays*, the distance may be increased to from $2\frac{3}{4}$ to $2\frac{7}{8}$ of an inch without detriment, but there are very few persons who could view them without straining the eyes (if placed at the last distance) through a stereoscope with entire lenses. We, therefore, recommend $2\frac{3}{4}$ inches as the best distance in general measured against the distant objects.—Ed.]

COLLODIO-ALBUMEN.—TONING.

To the Editor.

Sir,—As an unsuccessful amateur in the collodio-albumen process, which has met with such good results in the hands of Mr. Mudd and others, I write to you hoping to learn the causes and remedies for failures with this truly light subject.

Our system is as follows (for I and a friend join in wasting material):—After carefully cleaning the glass and coating with Ramsden's negative collodion, sensitising in a forty-grain bath, we carefully wash away all traces of free nitrate and then flood the plate four times with the albumenising mixture, composed according to the formula recommended by Mr. Mudd, in your March number for 1860. We then carefully bake before the fire: after being put aside for several days sensitise again in the same bath, and carefully wash as before, when it again undergoes the baking process. We use a Kinnear's camera, with a Ross's orthographic lens, for plates 11 × 9, and expose for twenty minutes in strong sunlight, with a $\frac{1}{2}$-inch stop.

On proceeding to develop with the ordinary pyrogallic solution (using citric acid) the film assumes a very dark *amber* colour, clouded, and darker in some places than others. No application of the fixing mixtures (hyposulphite of soda) will modify this appearance, which prevents the negative printing, except very faintly, although left for four hours in a strong light with occasional direct rays of sunlight.

Is the albumen sufficiently diluted?
Is the collodion in fault? or is the exposure too long?
Is the bath out of order?

In our printing operations we also find difficulties. The purple tone, so desirable, vanishes on fixing; occasionally a mealy appearance presents itself; and, to crown all, the abominable yellow tint pervades the print. The paper we use is Hope's, albumenised some time ago—about three or four months. Carbonate of soda is also added to the fixing. The prints are afterwards washed, finally in warm water, and dried between sheets of blotting-paper with a hot iron. As an old subscriber, and one who has had tolerable success with the wet process, and worked hard for some time at the dry process, I beg to subscribe myself your's, &c.,

DRY PLATE.

P.S.—What kind of changing apparatus do you recommend for dry plates 11 × 9? and what is the price of Smartt's tent?

Rochdale, April 5, 1861.

[Your nitrate of silver bath: query—Does it contain a fair amount of free acetic acid, say ten to fifteen minims to each ounce of fluid? If not, this will account for your failure.—The second "baking" of the sensitised plates: Is it certain that there is no access of light during this operation? Try without the second baking, but simple and careful drying in a dark place substituted. It is possible that your exposure may be too long; but this is rarely the case with collodio-albumen. Your plates, however, betray unmistakeable evidence of fogging, so that we should advise a shorter exposure, say *one-half* the time previously given.—The print received indicates too small a quantity of nitrate of silver in the paper sensitising bath. Make it stronger; wash away all free nitrate before you tone; and use a stronger fixing solution. Be careful also not to expose the proof to strong light while undergoing these operations. If properly toned, the colour ought to change but very little in the fixing bath.—Ed.]

STEREOGRAPHS OF JAVA.

To the Editor.

Sir,—We shall feel obliged by your stating in your next number that the negatives of the stereoscopic views of Java, so favourably noticed in your Journal, were printed by us from *collodion* negatives taken by Mr. Woodbury, of Batavia, Java. It is only just to that gentleman that he should have the credit of having produced negatives which, in point of artistic effect, we believe to be unequalled.—We are, yours, &c.,

April 10, 1861. NEGRETTI & ZAMBRA.

SCALE OF THE IMAGE.

To the Editor.

Sir,—In your answer to my question in your number of the 15th ult., you say that I do not suppose that the real size of an image at a hundred yards off, formed by a lens of thirty-six inches focus, will be equal to that of the object itself. No; but I did say that this image appeared about equal to that of the image formed by my eye at the same distance as the lens from the object. You go on to explain the conjugate foci of lenses, and, I respectfully say, badger my question. My question was:—How is it that my eye, which is such a short camera, produces an image equal to that in a camera three feet long?—because if we can shorten our camera, or increase the size of the image, we are gaining an important improvement. The view from my bedroom window is magnificent; but if I put my camera to it the beauty is quite lost: a strip of about an inch in width contains the river, ships, bridges, mountains, &c., too small to fairly represent them. Now, a camera of three feet is a very awkward thing to use; and, as I find the light from my long-focus lens is scattered over a circle the diameter of which is at least five feet, my light (when it is diaphragmed) is very attenuated. The nearest approach I am acquainted with is the plan of placing a concave lens between a portrait combination; but as I wish you and others to think on this point, I write again, as three out of four of the views I wish to take are on too grand a scale for our ordinary cameras; and if I construct long-focus lens cameras, I fear I shall meet with other serious difficulties.—I am, yours, &c., ANTIPODES.

[The sizes of the images of a distant object produced by lenses of different foci are proportionate to the foci respectively, consequently as the focus of the lens of the eye is about one inch in length, it follows that the *actual* size of the image of an object one hundred yards distant, as formed on the retina, will not be greater in diameter than one thirty-sixth part of the size of the image formed by a lens of three feet focus. But the *actual* size of the image on the retina has, alone, but little to do with its *apparent* size to the observer. You are, however, confusing the two things, as the following experiment will demonstrate:—Place your three-feet-focus camera lens at the window of your room, and focus carefully, so that the image appears to be, as you assert, of the size of nature. Now leave your camera where it is, and retire to the opposite side of your room; you will immediately perceive that while the size of the *real* subject *remains the same*, the apparent size of the image in the camera is materially reduced. You are pursuing a phantom, and a very flimsy one it is.

In order to obtain the view to which you make allusion, *on a large scale*, you must have a lens of long focus, and then you will be sadly disappointed to find that the *angle of picture* included will be so small as to take in but a fractional part of your subject. This is a case in which Mr. Sutton's panoramic lens may be appropriately applied, as the distortion produced by flattening out the cylinder upon which the negative is taken (or, what is equivalent thereto, flattening the positive proof printed from it) will not be offensively apparent in such a subject. Be assured you cannot in any way materially shorten your camera and yet have your subject delineated upon a large scale.—Ed.]

ANSWERS TO CORRESPONDENTS.

F. M.—You will find the formula in the Almanac for the present year.

In a Fix.—We have a series of articles now in preparation on the subject.

Samuel Evershed.—You will find what you desire in the present number.

Robert L. * * * *—We shall be happy to receive the communication proposed.

T. Roberts.—Apply to the Secretary, whose address you will find in our Almanac.

S. M. B.—On no account would we do as you propose. We never delegate that office to another.

R. J.—We have no time to spare for such an unpromising experiment as the one suggested.

T. C.—We are obliged for the permission, but we do not *copy*, especially from the publication named.

Robert W. Baker.—See reply to S. Evershed. We shall have an article shortly upon the second subject named.

Curious.—We know the habit of the individual named too well to think as you do. We do not intend to take the slightest notice.

Matthew.—The neighbourhood of Dorking, Boxhill, and Reigate abounds with subjects fit for your purpose—in fact it is almost inexhaustible.

E. J. H. (Dudley.)—Your letter having reference to the business department of the Journal does not come under our cognisance; but we have forwarded it to the publisher, who will, no doubt, have communicated with you ere this.

Negro.—M. is best. We are *not* responsible for opinions expressed by contributors to the Journal, though we generally take exception, specially to any that are absolutely erroneous, and always when likely to mislead our readers.

M. D.—1. Most assuredly we *do* mean albumenised plates *without* collodion. See Mr. Negretti's paper on Ferrier's process in the present number.—2. By placing the diaphragm obliquely in the tube of the lens mounting, so that the upper part leans *from* the lens.

Beatrice.—We can scarcely advise you to commence with the waxed-paper process; but should you decide on doing so, you had better adopt the modification known as the turpentine waxed-paper, devised by the Rev. J. Lawson Sisson. Pamphlet procurable at Marion and Co.'s, in Regent Street.

T. G. Perry.—1. Your formula for toning is good; the behaviour of your proofs indicates some fault in the preparation of the paper, as there is nothing fairly to account for *blistering*. The turning of a red tone in the fixing-bath shows that they were not sufficiently acted on in the toning-bath: try heating it, and also adding a drop or two of free nitric acid to the sensitising silver bath.—2. At least twenty-four hours. Rain water would do well.—3. The first-named is the best; but see Mr. Dawson's paper in the present number.

Lazy Jane.—If you proceed as you now propose we can safely promise you a fine crop of faded proofs in due time. We protested against such a method of toning at the time of its first introduction, and demonstrated that, if sulphur toning be admissible at all, it might be more perfectly, economically, and easily accomplished by the aid of hydrosulphate of ammonia, used in a dilute state, than by adding an acid to your hyposulphite of soda bath. For travelling, you may make some very useful trays of paper—first impregnating it with a solution of gutta percha in benzole.

Leoni.—We cannot too often repeat that, in *our opinion*, the gold toning commonly called "alkaline" is the only process of toning that ought to be followed; but you perceive that we have some names of note on the other side, so you must either judge for yourself or choose those in whose judgment you have most faith to guide you. We have no wish to force our opinion upon others; but never shrink from giving it if called upon to do so, even when opposed to that of generally recognised authorities. We are very obstinate about judging for ourselves.

J. B. B.—1. There is very little amiss with the figure in the hat—the other is not in focus and deficient in detail. The coarseness of grain may be from the use of too much citric acid in the developer; but is also likely to have arisen from an over-iodised collodion. That of the *horny* kind, and bromo-iodised, is best adapted for the purpose. Make your developer thus— Pyrogallic acid two grains, water two ounces, acetic acid half a *drachm*, citric acid half a grain.—2. 3¼ by 2¾ is a good size, or *smaller*.—3 and 4. You only want an illuminated lens to work by artificial light, and in that case you want *two*—first, a two and half inches bull's-eye; and, second, a bi-convex, six inch diameter, seven or eight inches focus.

J. Martin (Workington).—You will find several communications relative to the Resin process in the various numbers of the current, and late ones of the last, volume. The process is extremely simple, and may be shortly described thus:—To each ounce of a sensitive bromo-iodised collodion add one quarter of a grain of pure white resin, which will readily dissolve therein. Coat and sensitise your plates in the usual way, using for the purpose an ordinary silver bath, with a small quantity of free acetic acid, say five minims to each ounce of both. Wash very copiously with common filtered water, and drain and dry in the dark. After exposure dip the plate in the silver bath, and then develop with an ordinary pyrogallic and acetic acid developer; wash and clear with hyposulphite of soda in the usual manner. For particulars of exposure, and some other details, see Mr. Glover's article in our last number.

F. B.—There is certainly some detrimental influence at work in your preservative-box that in its present condition renders it quite unfit for its purpose. You say that the varnish is dry and hard; but are you sure of this? It strikes us as possible that the varnish may have been made with *methylated spirit*, in which case it would fully account for the evil so long as any scent of it remains. We recommend you to expose the box and lid freely to the open air and sunshine if possible during the day time, and at night put into the box a saucer and tuft of cotton wool, upon which put a few drops of *bromine*, and cover it quickly with the lid. Do this alternately for several days and nights until the scent has entirely disappeared, and then test your box in the same way as before. The exposure with the compound will be about two-thirds of the time requisite for the single lens—that is, two minutes instead of three.

R. T. D. (Novice).—The fault of your toning is not in the sensitising bath, but in the toning bath itself; but, without more information, we cannot point exactly to the weak place. The "instantaneous" view is by far the best of the whole. The negative is over-exposed, but is also developed too much. Your sky is weak, possibly from there being a shade too much bromide in your collodion, or too little pyroxyline. Add a little more of the latter, and try again. The stain on the sky of Ovingdean Grange appears to be from the corner whence the last drop of liquid was drained. It may be from draining the nitrate upon contaminated blotting paper, just before putting the plate into the slide; or it may arise from the last drop of water remaining when the plates were put to dry after washing, and prior to coating with collodion. You will find an abstract of the paper on the albumen process in the present number.

*** The Publisher regrets that he has been compelled to omit a large number of Advertisements from this Number.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 141, Vol. VIII.—MAY 1, 1861.

Exhibition of 1862.—As a matter of course our readers will be in ecstacies of delight at the honourable position assigned to photography in the forthcoming industrial exhibition; for, instead of classing it amongst the ordinary graphic arts in Section 4, it is promoted to Section 2, and stands between philosophical instruments in Class 13 and horological instruments in Class 15, and is immediately associated with photographic apparatus of all kinds, which, with the results obtained from their judicious use, constitute Class 14. We have little doubt that it is to the interposition of the authorities at the South Kensington Museum that photographers are indebted for this very flattering arrangement, seeing that they have been of late so busily occupied in furthering the interests of the whole body of professionals connected with our art. It is also the more appropriate when we refer to the details of Section 4, which are as follow, viz.:—

Class 37. Architecture, including trowels and specimens of bricks and mortar.
„ 38. Colours, brushes, pencils; also paintings in oil and water-colour and drawings.
„ 39. Sculpture, chisels, clay, marble, models, mallets, &c.
„ 40. Needles, burins; also specimens of etching and engraving.

Only we cannot perceive why photography is to be so distinguished as not to be confounded with the above-named four classes of art productions. On looking again at the official document with which we have been favoured by the Secretary to Her Majesty's Commissioners, we find that we must have made some unaccountable mistake, for in the architectural class there is *no* mention made either of trowels or bricks and mortar; and similar remarks apply to the other classes in this section with respect to the various tools employed. Surely this is an unpardonable oversight. But no! we have, we fancy, hit upon the correct solution of the mystery. Our readers are aware that Her Majesty and her Royal Consort are both patrons of the Photographic Society, and, together with one or two of the Princes, practitioners of our art, and it was possibly intended as a *special compliment to them* to class photographs with cameras and tripods. Yes, it must be so; for are not the authorities of the South Kensington Museum always sunning themselves in the smiles of Royalty? and are not the Commissioners for the Exhibition *Her Majesty's* Commissioners?

It is, perhaps, just possible that some photographers of an ungrateful character may not perceive the advantage of exhibiting their specimens amidst a general jumble of incongruous adjuncts; and in that case it will certainly be excellent policy on the part of the Council of the Photographic Society to carry out the suggestion recently put forth in our columns by a correspondent, advocating the arrangement of an extensive exhibition of photographs in masses, according to the particular societies to which the various contributing artists belong. A special invitation might also be conveyed to our *confrères* on the other side of the channel with every prospect of a cordial response; for it is hardly credible that, while in Paris their productions are admitted to rank with the older fine arts, they will send them to this country to be associated in immediate juxtaposition with hardware and cutlery. Oh, no! our French brethren have much too keen a sense of the ridiculous to commit such an absurdity.

Fading of Positives.—We learn from our contemporary, the *American Journal of Photography*, that the members of the American Photographical Society have been occupied upon the subject of the fading of positive proofs; and that a paper by Mr. H. H. Snelling, late editor of the *Photographic and Fine Art Journal*, was read before that body, in which we regret to find that several mischievous practices are recommended and erroneous doctrines enunciated which will be likely to prove injurious to the printing branch of the art on the other side of the Atlantic, because of the authoritative position of the author, unless the unsound points are speedily controverted; and this we have some hope will be the case, for we notice that in discussing the probable permanence of some pictures one speaker remarked: "In fact, they invariably improve in appearance by keeping"—to which Mr. Garbanati judiciously replied: "Any improvement implies *change:* give them [the pictures] time enough and the change might not be an improvement." This observation is undeniable, and our American friends will do well to bear it in mind. With regard to Mr. Snelling's advice and opinions, we find him recommending that the silver solution should be *well rubbed into the paper*—to which end he advises "not to fear labour." Again he says: "Sufficient of the sulphuret of silver" [an insoluble compound] "may be got rid of in washing to prevent the advance of decomposition." We are not a little amused at finding *tobacco-juice* put down as one of the causes of fading—a statement which we are not inclined to dispute, but scarcely think it needful to caution operators against it. In asserting the following, namely—"I have toned and fixed separately, and have used the toning and fixing solutions together, and I cannot give preference to either method so far as permanency is concerned"—Mr. Snelling probably inadvertently misleads his readers, because many might infer that allusion was made to the gold-toning bath. But this is not the case, so far as we can perceive from the remainder of his paper, for we find no mention at all made of a *gold-toning bath*, properly so called—though a toning bath containing a salt of gold in addition to *silver* and some other ingredients is adverted to; but this is a very different affair. From a careful perusal of the paper we have arrived at the opinion that from the facts set forth no conclusions of any value can be deduced; for the formulæ used in printing the numerous specimens appear to have been adopted almost haphazard, and without any systematic plan, while there is not the slightest evidence to show that the unfaded proofs did not owe their existence to simple preservation from moisture—a condition of things which we believe would preserve prints toned by almost any method.

Printing by Development.—There can be no question about the advantage of producing positive paper proofs by development provided that they can be executed as economically and perfectly as by the ordinary printing process—that is to say, of equal excellence. The great gain to be expected is the saving of valuable time: we therefore hail with pleasure any feasible plan for the attainment of so desirable an object. In another column we give extracts from a communication upon this subject by Mr. Lyndon Smith, of Leeds, which appeared in the pages of a contemporary, and which are quoted in the proper place. Many of our readers will doubtless be familiar with the works of Mr. Lyndon Smith, which have from time to time appeared in the various photographic exhibitions. That some, nay most, of his earlier productions display a considerable degree of artistic excellence we are quite ready to testify; and, though we have felt it needful to protest against the abuse of a certain method of treatment of his subjects to which Mr. Smith has lately addicted himself, we are not disposed to deny his possession of a sentiment for art. We cannot, however, always agree with his practice or his logic.

Upon what ground *undisputed permanence* is claimed for the proofs produced by the method of development recommended in the communication to which we refer we are at a loss to conjecture. All the evidence that we have been able to collect points to a contrary conclusion. The experiments made some years back by our *collaborateur*, Mr. Hardwich, went to prove that prints untoned by gold were in every instance, whether developed or not, inferior to those in which gold salts had been the toning agents; and further, it was also demonstrated that proofs developed upon the chlorided paper did not resist destructive agents any better than ordinary sun prints, though those developed upon an iodised basis appeared to have some advantage in this respect, but still in an inferior degree to the gold-toned specimens. It is asserted that the hydrochloric acid in the salting solution for the Canson's paper is active in enabling the operator to obtain clean and vigorous proofs, though it slightly impairs the surface of the paper. The quantity of citric acid in the sensitising bath is regarded as important; for without it the development is alleged to be beyond proper control, while with too much the half-tones are impaired.

Mr. Smith expresses himself as strongly against the use of albumenised paper, though apparently admitting some of its advantages. We must frankly admit that we *feel with him* in this matter; but we are not prepared to say, as he does, that "all this vigour and extra delicacy *must be* SACRIFICED" until we can fairly overcome some of the defects of plain paper—we mean especially inferiority of detail in the half-tones, and still more the unpleasant opacity in the shadows. When we can rectify these failings we shall no longer regard albumenised paper as we now feel constrained to do—a disagreeable necessity. In concluding we may remark that we feel not a little amused at the energy of Mr. Smith's peroration, which is too characteristic to be omitted.

Dry Process Without a Silver Bath.—We find from the pages of our contemporary, the *Photographic News*, that Captain Dixon and Mr. S. Fry are engaged in maturing the details of a process for producing a sensitive film on glass without the aid of a bath of nitrate of silver or any other substance—it being alleged that the sensitive film is produced at one operation, by means of a preparation poured on the plate. Mr. Simpson testifies to having taken three or four pictures by means of the preparation, and considers it a trifle less sensitive than wet collodion. A patent is about to be or has been secured for the preparation. We do not know anything of the composition of the preparation; but, should it contain nitrate of silver in combination with collodion, we doubt whether the patent will be valid, as a process was some short time back published in one of the French Journals—we believe *La Lumière*—in which this peculiarity was adopted. But then a bath of iodide of potassium was employed: in the present case it is asserted that no bath is requisite. Mr. Fry we know personally to be a very practical man, while his coadjutor is, we believe, not less so: we therefore have hopes of something really tangible in the matter before us.

In Articulo Mortis.—We notice with considerable regret that the Council of the Blackheath Photographic Society has deemed it requisite to recommend the discontinuance of the ordinary monthly meetings, in consequence of the difficulty experienced in procuring papers of sufficient interest to engage the attention of its members. It is now proposed to have occasional meetings, to be convened at the discretion of a standing committee; but we fear that the plan will scarcely be found to answer, and that the Society has, *de facto*—well! gone the way of many photographs. *Requiescat in pace!*

Forthcoming Photographic Exhibition at Birmingham.—With much pleasure we draw attention to an announcement in our advertising columns of an intended Exhibition of Photographs in connexion with the Birmingham Photographic Society, to be opened on Monday, the 27th instant. It is to be held at Aston Hall, near Birmingham, and will remain open for three or four months. Circumstances have prevented the Committee from issuing the notice earlier; but we trust the short time which elapses before the opening day will be turned to good account by the workers in our Art, so as to make the Birmingham Exhibition a great success, not only in the number but also in the general excellence of the pictures exhibited. We append the "regulations" issued by the Committee, by which it will be seen that our energetic brethren in the "black country" offer six medals—three silver and three bronze—for competition. We have reason to believe that Birmingham, in connexion with its Exhibitions, has hitherto been a generous patron of Art.

Birmingham Photographic Society.

REGULATIONS OF THE EXHIBITION TO BE HELD AT ASTON HALL.

The Exhibition of the Society will be opened on Monday, May 27, 1861, and will continue open three or four months.

All descriptions of photographs will be admissible, together with apparatus, &c., used in producing the same, or in any way connected with the art, as also photographic engravings, &c.

It is recommended that all pictures should be framed and glazed, and the margin of the mounting-board should not exceed three inches in width; but unframed prints will be allowed.

In the case of pictures of smaller size than 9 × 7 it is desirable that four or more should be placed in one frame; but no frame must exceed twelve square feet in area.

Each picture, or frame of pictures, must have the name and address of the artist and exhibitor distinctly written upon the back, together with a number, which number must correspond with a list of the subjects to be enclosed with them, specifying the particular process, whether calotype, waxed-paper, or the different varieties of collodion by which the negatives were taken from which the pictures were produced, and, if for sale, the price.

Touched or coloured prints must be accompanied by an untouched copy.

The Society will award three silver and three bronze medals for the best pictures in the Exhibition. One silver for the best portrait or group; one bronze for the *second* best. One silver medal for the best photograph of any other subject, landscape, composition, or otherwise; one bronze medal for the *second* best. And one silver medal for the best photograph from the solar camera. The whole of the above to be pure *untouched* photographs. A bronze medal will also be awarded to the best coloured photograph from the solar camera.

The solar pictures to be of not less size than 21 × 17, and unless taken in Great Britain will be disqualified from competing for the prizes.

All works intended for exhibition must be delivered at Aston Hall, near Birmingham, not later than the 20th day of May next.

Any picture received after the 28th day of May will be ineligible for competition for the medals.

A commission of 10 per cent. will be charged on all sales made during the Exhibition.

A list of the photographs sent must be enclosed with them, and a duplicate forwarded to the Hon. Sec., together with such other particulars of process as the exhibitor may wish to communicate.

At the close of the Exhibition the pictures remaining unsold, or not for sale, will be carefully packed and returned to the owners.

JNO. THOS. BROWN, Jun., Hon. Sec.

47, *Paradise Street, Birmingham.*

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XXII.

During the last twelve or fourteen months we have been favoured with a series of communications from Mr. J. W. Osborne, of Melbourne, describing the new photolithographic process, of which he is the inventor. A paper was communicated by him to the Melbourne Institute as long ago as November, 1859, describing all that had previously been done in the same direction, and exhibiting the main points in which the new method was considered to excel those which preceded it. On examining the back numbers of The British Journal of Photography, we cannot find any distinct statement of Mr. Osborne's process, although it is more than once alluded to in terms of commendation. An extended notice of it would be out of place in these "Comments," which are intended rather to call attention to objects of passing interest than fully to describe any particular process; but we are not without hope that the editor will, ere long, give an abstract of Mr. Osborne's original paper. Although the late exhibition did not, as far as we are aware, contain specimens either of the photolithographic or photozincographic processes, yet many such have been shown at the meetings of the London Photographic Society, and have excited universal admiration, especially the copies of maps and surveys, which are superior to anything done by hand, and can be produced at a tenth part of the cost.

Our principal object in writing this article at the present time is to comment upon two or three matters alluded to by Mr. Osborne in his letters, and of which, we doubt not, he will be willing to give our readers the benefit. It is evident from his remarks that the light in Australia is, actinically, far stronger than that of London, since he is able to work easily with lenses which failed to give any very decided intensity of image when examined in the glass-house of King's College. Even in Melbourne, however, the development of the image becomes slow and difficult when very small diaphragms are affixed to the lens, and fogging results as a consequence if the chemicals are not in very perfect order. A method which he has adopted with success to clean foggy negatives of maps and plans, is to treat the plate alternately with a solution containing free iodine and a solution of hyposulphite of soda. The irregular deposit of silver is thereby converted into iodide, and is subsequently removed by the fixing agent, the image itself escaping injury in consequence of the absence of half-tones. In replying to this note we advised a trial of the solutions which Major Russell uses for his dry process, viz., pyrogallic acid and a mixture of citric acid and nitrate of silver. The result was satisfactory, and we were requested to thank the inventor for the idea. A good mode of intensifying negatives of the kind we are now considering, without precipitating silver on the clear parts of the image, has long been required; and the plan of mixing the acid with the nitrate of silver answers very well when the proportions of the two ingredients are properly adjusted. It is not necessary for us to say more at present, since the experiments are still in progress, and the last number of the Journal contained an allusion to the subject.

Mr. Osborne, residing at a long distance from the source of supply, has tried his hand at manufacturing collodion, and speaks of the "parchmentised paper" as answering his purpose well in yielding an intense negative pyroxyline. Having heard this same commendation from others regarded as good authorities, we may take this opportunity of stating what were our reasons for discontinuing the use of the parchment-paper process:—First, on account of an uncertainty in the action of the parchmentising acid, which varied with the thickness of the paper and the nature of the fibre; and second, because it was difficult to regulate the exact time upon the first bath of diluted sulphuric acid, and a few seconds more or less materially affected the quality of the resulting collodion. As a commercial process, therefore, we hesitated to recommend it, and the wisdom of our decision is now apparent; for if some fail in obtaining uniform results with the process last described to the Photographic Society, the prospect of producing a normal collodion from parchmentised paper would have been small. This question of collodion of uniform quality is of the greatest importance; but we fear it will not be finally settled until the manufacture of ether is perfected. The best ether now sold is no doubt good, as far as regards its general use in the laboratory; but it is not up to the requirements of photography in the particular case of collodion iodised with a simple alkaline iodide.

Albumen is employed by Mr. Osborne in preparing his sensitive paper, in addition to the usual mixture of gelatine and bichromate of potash. He finds it to assist in fixing the design, which otherwise would be apt to fall away; but, if too much albumen be used, then it is difficult to clean off the ink from the unsunned portions. His experiments appear to show that the amount of real albumen in the white of egg is variable, and doubtless such is the case; but our own attention had not been directed to the photographic importance of the fact until his letter arrived. It may have something to do with the differences of gloss on paper, and with occasional difficulties in filtering the Taupenôt and Fothergill albumen.

Lastly, we have to speak of *lenses* for copying maps and plans to scale. What is the quality which may be esteemed as of the highest importance? Mr. Osborne assures us that it is *fine definition;* and in proof thereof calls attention to the minute letters which he is obliged to reproduce with absolute sharpness, even at the very corners of the field. Freedom from distortion is of consequence; but, if the means taken to secure it in any way injure the quality of the oblique pencils, he is of opinion that nothing will be gained. Some experiments that we lately made with an orthographic and a triplet lens have been published in this Journal, and were so far interesting that they showed what a carefully constructed instrument, of the new form, would accomplish. It is more than probable, however, that something will soon be produced which will eclipse both of these forms; for we are assured, on good authority, that, setting aside all calculations of expense, a lens might be ground after the manner of an astronomical telescope, capable of giving better definition at the edges of the plate than anything we have yet seen. The focal length of such a lens would be considerable, and, consequently, there would be less necessity for the use of means to obviate distortion. The aperture might be large, since the objects to be delineated lie in one plane, and a sufficient sharpness in the image would be secured by the perfect sphericity of the curves. These particulars are given on the authority of more than one competent optician; but the price of such an instrument is so considerable that no amateur would care to encounter it. If our own and foreign governments, however, find the new processes economical and certain, we shall, doubtless, soon hear of opticians competing for the honour of being the first to produce a really serviceable lens.

ON THE NEUTRALISATION OF THE NITRATE OF SILVER BATH BY CARBONATED ALKALIES.

By T. A. Barber.

[Read at a Meeting of the North London Photographic Association, April 24, 1861.]

Some three or four years ago I recommended oxide of silver for correcting free nitric acid in the exciting bath: this and the carbonate of silver are the only additions that can be made to effect the object, and at the same time preserve its integrity. It is however found in practice that there are many combinations of nitric acid which are not injurious, so this method is rarely adopted, the alkaline carbonates having the preference, as, being always at hand, they are the most convenient.

It is not my object in broaching this subject to condemn the use of alkalies, but just to point out a source of error that may arise from using the carbonates.

Carbonic acid gas is to some extent soluble, or rather it is tenaciously held in combination by aqueous solutions, so that when we add a carbonate to an acid it is only after waiting till the gas escapes or is driven off by heat that the fluid becomes in a fit state to receive the test paper. One of the best illustrations of the power of carbonic acid to redden litmus paper in the presence of an alkali is that of dipping it into a newly-opened bottle of soda water: the reaction is the same as if dipped into vinegar.

I recollect once reading in the list of "Answers to Correspondents" in The British Journal of Photography, a reply to one who had been adding carbonate of soda at the rate of a drachm to a pint of bath, without being able to neutralise the acidity. Now this was very likely to have been the fact; but the acid that changed his test paper was no doubt carbonic acid, which he had not allowed to evaporate before seeking advice. This applies in some measure to all cases when a carbonated alkali is used, more or less apparent according to the proportion of acid originally present.

Carbonate of silver is also open to the same objection, nor does it very readily part with its carbonic acid. I have exhausted my patience in endeavouring to dissipate the acid reaction on litmus paper by adding this carbonate. The remedy is, of course, time, or boiling the solution: we then get a bath absolutely neutral.

Wanting the oxide, I should recommend the caustic alkalies as preferable—it matters not which: ammonia forms no exception. There is no danger of spoiling the bath by an overplus; for, although

it may be made alkaline, this alkalinity is in no case due to the adjunct, but to the formation of free oxide of silver, which, after filtration, is easily corrected. In fact, the point of saturation is passed when turbidity commences, and whether the bath be acid or alkaline it is immediately available to test paper.

The alkaline acetates are sometimes used to correct free nitric acid, but are open to the objection that there is no knowing when the decomposition is completed, and we have to guess as to whether we leave nitric acid or form more acetate of silver than we intend.

The objection to the employment of oxide of silver for neutralising free acetic acid applies equally to the use of carbonate of soda: acetate of silver is formed in both instances—directly by the oxide, and indirectly by the latter. The soda unites with the acetic acid, forming acetate of soda, then double decomposition follows with this and the nitrate of silver; resulting in nitrate of soda and acetate of silver.

It has been recommended of late to use recrystallised nitrate, as being the purest form of obtaining it. Formerly the fused was said to be the best. There is no doubt that the oftener you repeat the process of crystallisation, each time rejecting a portion of the mother liquor, the purer will be the result. This method is necessarily much practised in organic chemistry, but is quite inexcusable when dealing with nitrate of silver.

My advice to photographers is to buy their nitrate as cheaply as the competition of manufacturers allows them, and doctor it themselves with oxide. This, with the influence of light, will free it from both acid and organic matter, leaving a solution purer than is attainable by any other means. Let them also bear in mind that recrystallisation is no guard against sophistication.

ON ENLARGING FROM MICRO-PHOTOGRAPHS.

By T. Skaife.

[Read at a Meeting of the Blackheath Photographic Society, April 15, 1861.]

A microscopic photograph, whether under the name of "pistolgram" or otherwise, although generally appreciated for its *multum-in-parvo* properties by eyes that luxuriate in small print, yet, as a "change comes o'er the spirit of the dream," so it is with the idol of affection, whose image, secreted in a little gold locket, is there exclusively worshipped by one devotee. But when the beloved one merges into *paterfamilias*, so does his image require an amplification of proportion—not only to meet the necessities of patriarchal eyes, but to be in keeping with the patriarchal gallery. Here our art science has stopped short—to the satisfaction of sundry artist painters no doubt, but not equally so to those who would see in the life-sized family portrait that truthfulness perceived in the miniature photograph.

To meet this want photographers are now taxing their ingenuity, and enlarging cameras with more or less success. Chief, perhaps, amongst the enlarging class is Woodward's solar camera; but which, though well adapted for sunny Egypt, or Brighton during the "dog-days," stands small chance of being appreciated in the neighbourhood of London smoke while the sun is walking south of the equinox.

To a modification of the electric light the hopes of cloud-capped and fogged photographers are now turned. But, not to waste time in anticipations of the epoch when the sun is to be outshone at noonday, I have trimmed me a chamber lamp, which, with its complement of wick and oil, cost sixpence. This, on being lit and placed within the focus of a glass reflector,* can have the image of its flame reflected upon the surface of the pistolgram. Now, supposing an enlarged reproduction is required from this small photograph, I replace it in the back of the pistolgraph, which I pose opposite the reflector at a distance from the latter of about double its radius, and place the lamp midway or nearly so between the two, moving the lamp backward or forward until the pistolgram appears brilliantly illumined. Now if a white screen be placed in front of the pistolgraph (from which the shutters have been removed), say at the distance of three feet, a large picture will appear projected thereon *à la* magic lantern. Beneath the screen upon which the magic photograph is projected I place a second table *vis-a-vis* to the first, upon which stand the pistolgraph, lamp, and reflector—a sufficient space being left between the two tables to admit of the operator and his chair.

Upon this second table I place a drawing board fixed perpendicularly in a foot, which, when viewed in profile, has the form of a ⊥ square. In this instance my drawing board, you will perceive, is a stout mahogany picture-frame, across the back of which two pieces of wood are screwed, so as to form a groove into which the frame is pressed. On the plate glass in the frame I fix a sheet of drawing or common cartridge paper by the two upper corners with a little gum. This done, I next decide on the size of the required enlargement, sliding the drawing frame nearer or farther from the pistolgraph and obtaining a proper focus that way, or by turning in or out the screw of the lens. I then take a small sable pencil dipped in a little neutral tint, and pass it over all the light parts of the picture, repeating the process until the illumined parts have attained the shaded density of the shadows: which done, on bringing a light to the front of the lens, an imitation photograph will be found to be the result. Although this imitation, if hastily done, will be found wanting in some of the minor details of the original, the deficiency will be more than compensated by the better adaptation of the imitation than the genuine photograph to receive the colour thereon when applied by the skilful touch of an accomplished artist; for the material upon which most artists prefer to paint, whether in oil or water-colour, is not generally that best adapted for a photograph, and *vice versa*. Nor does experience prove that a painting, whether done in water or oil, on a photographic base is as durable as one otherwise painted.

Formerly the Messrs. Dickinson, of Bond Street, whose pictures from photographs have attained such high celebrity, painted upon the photograph; but, in consequence of the numerous complaints made of the fading of pictures so painted, I was informed some months ago by one of the firm that they had abandoned that system, and now employed competent artists to copy all their best photographic portraits by hand when intended to be finished in colour from the life. The experience of the Messrs. Dickinson, coupled with that of others, added to the no small trouble entailed in obtaining an enlarged negative from a micrograph, has induced me to adopt the plan just described, which, where only one or two enlarged reproductions are required for artistic purposes, answers excellently—a great saving of time being effected thereby, as the head of a child or other subject, which would take a skilful artist many hours to copy or enlarge by the unassisted eye and hand, could by the magic lantern means be copied more correctly in one-quarter of the time.

[Here Mr. Skaife placed a photographic portrait on glass the size of a small finger nail in the back of the pistolgraph; then lighting his small lamp (the gas being turned down) an enlarged picture was perceived on the drawing-board screen, which was increased up to life size or diminished accordingly as the screen was slid backward or forward. Finally, adjusting the focus to about half-life size, he passed a small sable pencil charged with a shade tint rapidly over the distinctive light parts of the picture for a few seconds; then slightly turning the lid of the box upon which the "magic lantern" apparatus stood, the enlarged negative image appeared to slide off the sketch like a mask, revealing the progress of the sketch in contact with the parent negative standing close by.]

You see it is not necessary that the enlarging copyist should be a draughtsman in the artistic sense of the word, although before the mere photographic imitation can rank as a work of art the mesmerising hand of an artist must pass over it.

* Price half-a-crown.

STRENGTH OF NITRATE OF SILVER SOLUTION,

DEDUCIBLE FROM THE SPECIFIC GRAVITY.

By Geo. Dawson.

[Communicated at the North London Photographic Association Meeting, April 24, 1861.]

The following table has been constructed from solutions of pure nitrate of silver in distilled water at the temperature of 60° Fah. It is not intended to show the weight of nitrate dissolved in a certain number of fluid ounces of water, but the actual amount present in each *measured ounce of the solution;* for, as I have already explained in a previous paper, the bulk of the liquid increases, but not in a uniform ratio, by the addition of successive doses of nitrate of silver. Suppose, for instance, in making a collodion bath we measure out a certain quantity of water, and dissolve therein thirty grains of nitrate of silver for each fluid ounce, we shall find, in the first place, on a careful remeasurement of the solution, a considerable increase in bulk; and, secondly, as a necessary consequence, that a careful analysis will barely yield twenty-nine grains of the salt to the fluid ounce. Moreover, if we try the same experiment with what is usually called a hundred-grain solution, it will have ex-

panded proportionately to a still greater extent, and analysis will only show about ninety-four grains. On account, therefore, of this expansion ever varying according to the strength of the solution, I have deemed it more convenient for photographers generally, and more consistent with the results of precise analysis, to indicate by the specific gravity the weight of nitrate actually present IN one fluid ounce of solution. Although this has materially increased the labour of construction, it has given us greater precision and uniformity.

TABLE FOR ASCERTAINING FROM THE SPECIFIC GRAVITY TO THE NEAREST GRAIN THE AMOUNT OF NITRATE OF SILVER CONTAINED IN ONE FLUID OUNCE OF ANY PURE SOLUTION, 60° FAH.

Grs. per fl. oz.	Sp. Gr.	Grs. per fl. oz.	Sp. Gr.	Grs. per fl. oz.	Sp. Gr.	Grs. per fl. oz.	Sp. Gr.	Grs. per fl. oz.	Sp. Gr.	Grs. per fl. oz.	Sp. Gr.
10	1,021	32	1,063	54	1,105	76	1,146	98	1,187	120	1,227
11	1,023	33	1,065	55	1,106	77	1,148	99	1,189	121	1,229
12	1,025	34	1,067	56	1,108	78	1,150	100	1,191	122	1,231
13	1,027	35	1,069	57	1,110	79	1,152	101	1,193	123	1,233
14	1,029	36	1,070	58	1,112	80	1,153	102	1,194	124	1,235
15	1,031	37	1,072	59	1,114	81	1,155	103	1,196	125	1,236
16	1,032	38	1,074	60	1,116	82	1,157	104	1,198	126	1,238
17	1,034	39	1,076	61	1,118	83	1,159	105	1,200	127	1,240
18	1,036	40	1,078	62	1,120	84	1,161	106	1,202	128	1,242
19	1,038	41	1,080	63	1,122	85	1,163	107	1,204	129	1,244
20	1,040	42	1,082	64	1,123	86	1,165	108	1,205	130	1,245
21	1,042	43	1,084	65	1,125	87	1,167	109	1,207	131	1,247
22	1,044	44	1,086	66	1,127	88	1,168	110	1,209	132	1,249
23	1,046	45	1,088	67	1,129	89	1,170	111	1,211	133	1,251
24	1,048	46	1,089	68	1,131	90	1,172	112	1,213	134	1,252
25	1,050	47	1,091	69	1,133	91	1,174	113	1,215	135	1,254
26	1,051	48	1,093	70	1,135	92	1,176	114	1,216	136	1,256
27	1,053	49	1,095	71	1,137	93	1,178	115	1,218	137	1,258
28	1,055	50	1,097	72	1,138	94	1,180	116	1,220	138	1,259
29	1,057	51	1,099	73	1,140	95	1,181	117	1,222	139	1,261
30	1,059	52	1,101	74	1,142	96	1,183	118	1,224	140	1,263
31	1,061	53	1,103	75	1,144	97	1,185	119	1,226		

CORRECTION FOR TEMPERATURE.—For every 10° below 60° *deduct* one grain from the number quoted in the table, and for every 10° above 60° *add* one grain to the number tabulated.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. ROTHWELL.

No. IV.

WITHOUT entering specially into the subject of copying in this place, I must, to make myself understood, go somewhat into it in connexion with definition; for the two are so inseparably involved in the matter on which I am about to state my views that to do so cannot well be avoided. Although my object in these papers is to elucidate the practical optics of photography, I am, in this case, under the necessity of theorising to arrive at practical results.

As I stated at the latter end of my last paper, No. 3, I believe myself to be the first hereby to draw public attention to, and to discuss, the subject of the natural divergency of light, or its tendency to radiate *as affecting definition*, particularly in copying. Let no one run away with the idea that I am laying claim to having discovered the principle or property of light to diverge; but that in the construction of lenses, and in the practical optics of photography this principle has not hitherto been taken into account, as regards its influence on definition.

Opticians and all photographers who have attempted to enlarge pictures by copying, know practically that the definition is nothing at all approaching satisfactory—not even when that universal improver of definition, a small stop, is used: in fact, when a picture is enlarged *much*, say four times linear, or from a one-ninth to a whole plate size, or from a one-third size to a twenty-two by eighteen plate, the thing is a complete failure through astigmation, or the impossibility of producing good definition, whatever size of stop may be employed. Woodward's solar camera would be an invaluable instrument were it not for this evil. Copyists are well aware that, in the case of copying by lenses, when the copy is of the same size as the original, that the definition is much better than in the case of *enlarging*, and that as the copy is smaller the definition improves; and if the original or other objects are at such a distance that the rays before striking the lens may be considered parallel, then the definition is the best possible.

I should suppose another thing is generally pretty well known, viz., that if one picture be taken direct of a certain size, by a lens of a particular focal length, and a second be produced by being enlarged from a small picture (to the same size) in copying, the conjugate focal length being equal to the focal length by which the direct picture was taken, then I say the definition of the direct picture is very much superior to that produced by enlarged copying. What is the cause of this very great evil? I will explain it according to my ideas on the subject.

There are three reasons to be given in accounting for it:—First, the natural divergency of light. In the case of enlarging by copying, the light is in a divergent condition in consequence of the short distance the picture which is being copied is from the lens, which divergency is supposed to be changed into convergency in passing the lens. Now although the light does undergo a change in direction at every part of the lens, and so appears to be directed to a focus, yet I am inclined to think that the light after passing the lens at any part, notwithstanding its *altered direction* everywhere except at the centre, is still in a divergent state; for if we take a very small portion after passing the lens, and which we expect to come to a fine point or focus, it will pass the focal point in a state of divergency, and when the conjugate focal length is something considerable in the case of enlarging *much*, the definition is so bad as to be perfectly intolerable. It is quite evident a small stop will not cure this. On this hypothesis it will be readily comprehended, without much ractiocination, how it is that, as the conjugate focal length, and, consequently, the size of the picture increases, the definition becomes worse in consequence of the increased divergency; and, on the contrary, when the conjugate focal length is shortened, and the size of the picture reduced, the divergency is less, and therefore the definition better.

The second reason is, that hereto we have no lens which will fulfil the conditions indispensable in a good copying instrument; but I am in hopes of producing one myself shortly to answer that purpose. The calculations which have been made, and the lenses constructed according to them, have all been contrived to answer in case of parallel rays.

The third reason is, that in enlarging by copying a similar effect is produced to magnifying by the microscope. A small object may appear to the naked eye to have a very sharp outline; but, when much magnified, that which seemed sharp becomes rough and jagged. Of two pictures taken direct—one of one-ninth size, and another of whole-plate size, and both what would be considered equally sharp—if we enlarge the one-ninth size to that of whole-plate, and the enlarged copy was actually *equally as sharp according to size* as its small original, yet I say the *copy* would appear rough and coarse in comparison to not only the small one, but to another large one also which had been taken *direct*, in consequence of our being able to see it under enlarged dimensions—or, in other words, we should see the enlarged copy having the *definition* (of the small original) magnified, similar to the case of the microscope; therefore do not forget this, ye copying photographers, who desire good definition, *that, to obtain an enlarged copy of a small picture, the said copy to be equally sharp with another of the same size taken direct, and even with a lens which is all that can be desired*, the small picture must be *extremely sharp*, and the focussing *rigorously exact*, or the thing will be an impossibility. The chemicals must also be in the finest order. This point has not received that deep consideration, nor been investigated in the searching manner, one would have expected from some of the master minds in optics and photography.

Where is the use of expecting to enlarge a picture by copying, and yet suppose that the *definition* will not be enlarged at the same time—that is, that the definition of the magnified copy will seem as fine as it did in the original? What an absurdity! what abortive work, for want of a little investigation!

There are several other things which practically affect definition, and which must be attended to by those who wish to produce first-class work. If a lens is used for a length of time without being cleaned, there is a kind of film adheres to the surfaces, as if the elements of the atmosphere produced some chemical action on them, and which, if not cleaned off frequently, produces a marked effect on the definition and clearness of the picture, and which has been attributed to the chemicals and supposed-to-be fog. Dust, even though in small quantity, must be cleaned off frequently. So far as my experience goes, soft wash-leather, free from dirt and grit, is the best thing with which to clean lenses. Sometimes, by repeated and careless cleaning, the surfaces of lenses become so rough and scratched as to be almost valueless, which will of course be rectified by nothing less than repolishing, or entire new lenses. One or two small marks or scratches are of no great consequence; but, if numerous, they are very injurious to definition.

As the divergency of light, in its influence on definition, has not been investigated at all, so far as I have read or heard—and as any such influence or action may be totally denied or ignored by some scientific men—I purpose giving, after the conclusion of this series of papers, another on this particular subject, wherein I believe I shall be able, with the assistance of diagrams, to demonstrate the

matter in such a way as to convince the most sceptical that this is one of the great obstacles in the way of the onward march of photography, and also the means of removing it.

[The editor desires that it may be distinctly understood that he is in no way responsible for the views held by Mr. Rothwell.]

MAGNESIUM AS A SOURCE OF LIGHT.

Professor A. Schmitt calls attention to the practicability of employing metallic magnesium for purposes of illumination, as has already been suggested by Bunsen. From the researches of the last-named chemist, it is known that when magnesium is ignited it readily takes fire and burns with an exceedingly brilliant flame. The intensity of the light thus produced, as determined by Bunsen and Roscoe, in one of their photochemical researches (*Pogg. Annalen*, cviii. 261, *et seq.*) is only some 525 times less than that of the sun. Compared with an ordinary candle, it appeared that a wire of magnesium 0·297 millimetre [1 mm. = 0·0394 inch] in diameter produced as much light in burning as seventy-four stearine candles five to the pound. In order to support this light during one minute, a piece of wire 0·983 metre long, weighing 0·1204 grm. [1 grm. = 15·4325 grains], was required.

Only 72·2 grms. of magnesium, therefore, would be needed in order to maintain during ten hours an amount of light equal to that of seventy-four stearine candles consuming about 10·000 grms. of stearine.

According to Bunsen, magnesium wire is readily obtained by forcibly pressing the metal through a hot steel die by means of a steel piston. Bunsen's arrangement for burning the wire was made by connecting spools of it with rollers moved by clock-work, so that the work should be unrolled like the ribbon of paper in Morse's telegraph, the end of the wire thus gradually pushed forward, passed into the flame of an ordinary alcohol lamp, where it took fire.

It is evident that a magnesium lamp of this sort must be much simpler and more compendious than any of the existing arrangements of the electrical, or of Drummond's light. For light-houses, &c., where an intensely brilliant illumination is required, it can hardly fail to rival either of these. Where an extraordinary amount of light is needed, it could readily be produced by burning large wires, or several thin ones at the same time. Another important consideration is the fact that the spools of wire, as well as the clock-work and spirit-lamp, are easily transportable.

It is not, however, to the intensity alone of the magnesium flame that these lamps owe their utility, for the photochemical (*i.e.*, photographical) effect of the light is also very great. According to Bunsen, the photochemical power of the sun is only 36·6 times greater than that of the magnesium flame. The latter must therefore be useful in photographing by night or in any dark or subterranean locality—the evenness and remarkable tranquility of the flame especially commending it for this purpose.

The present high price of magnesium, it is true, must prevent any extended use of it for technical purposes. For example, Lenoir of Vienna charges three Florins [1 Fl.=51 cts.] for a grm. of it; hence the cost per minute of the light just described would be 36 *Neukseutzer* [1 ktr.=about ⅛ of a ct.]; and the cost during ten hours, would amount to 216 Florins, while the ten kilogrammes of stearine could be procured for less than 14 Florins. But even at this price it could still be used by photographers, since it would only be required for exceedingly short intervals of time, and all unnecessary consumption of the wire might be prevented by stopping the clock-work.—*Stamm's Illustr. Zeitschrift*, 1859, p. 332; in *Polytechnisches Notiz Blatt*, 1860, xv. 56.

HYPONITRITE OF LEAD SILVER BATH.

By M. M^c^-A. Gaudin.

I have been making experiments upon the addition of hyponitrite of lead to the silver bath. This is how I have operated:—I dissolved two and a-half drachms of nitrate of lead in twenty-five drachms of common water; I added ten drops of nitric acid; then I poured the mixture into a pan, formed of a thin sheet of zinc turned up at the sides. On stirring it with a thin piece of zinc all the lead was precipitated in lumps. As soon as the reaction had ceased (known by the lead being no longer deposited upon the bottom of the pan), I washed the precipitate several times with water to remove the nitrate of zinc which had been formed.

I then placed this granulated lead to digest in a pan containing two-and-a-half drachms of nitrate of lead and twenty-five drachms of water. On heating the pan slowly a few gas bubbles were disengaged; and, at the end of an hour, the liquid had assumed a pure yellow colour: a small white deposit had also been formed. The liquid, when filtered, was a concentrated solution of hyponitrite of lead.

By adding to a silver bath a fourth part of its volume of the solution thus obtained, plates sensitised in it gave beautiful negatives when developed with acidulated protosulphate of iron and concentrated gallic acid, to which alcohol had been added to facilitate the flowing of the developing fluid. In order to obtain a negative free from spots, it is important that the plate should be uniformly moistened by this silver bath, by the usual manipulation followed by experienced photographers.

If a plate thus prepared is passed into an iron bath there will be instantaneously formed a negative of an olive green by reflected, and of a deep red chestnut colour by transmitted, light. If, on the contrary, it is desired to pour on the iron developer, it is necessary to dilute it with ten parts of water, otherwise it will be impossible to avoid stains. When gallic acid is poured upon it, its action is much slower; the negatives are of a blue slate colour by reflected, and of a dark green by transmitted, light. In consequence of the colour of the proofs, this bath could not be used for producing direct positives.

Before adding hyponitrite of lead to the silver bath I attempted to produce a negative with gallic acid; and, as it ended in failure, I thought of adding to gallic acid some hyponitrite of lead, which caused a negative to appear immediately. This fact is of great importance, because it shows that developing agents incapable by themselves of acting effectually upon a given preparation which has been exposed to the action of light acquire a sufficient energy on the addition of certain substances; and if to bodies excessively reductive an acid is added to moderate them, it will be necessary to add to inert bodies another reductive whose combined action will produce the expected effect. Thus gallic acid is not well adapted for producing negatives upon collodion sensitised with an ordinary silver bath; but from the fact just mentioned there must exist a great number of substances which, on being added to gallic acid, will cause it to act like pyrogallic acid; but the mixture must not be subject to decomposition.

From what I have said, I do not believe that the bath of Schoer which I aimed at producing is prepared with hyponitrite of lead, for this bath gives with sulphate of iron positives of a beautiful white. I strongly suspect that it owes its qualities to subacetate of lead. I spoke much of it on its first appearance; but, wishing to allow time to its inventor to profit by it, I did not even analyse it. This time has expired, and in a few days I shall have a small quantity at my disposition, and there will be nothing to prevent me examining it and publishing the result for the benefit of photographers.

I believe, however, that the progress of photography lies in the modification of the developing solutions employed with the ordinary silver bath. I am convinced that the protosulphate of iron is susceptible, with suitable additions, of rivalling pyrogallic acid; but, in fact, the employment of protoacetate and protonitrate of iron has already given me that result, with the advantage of not marring the blacks, and consequently giving negatives which became vigorous positives. As I have already said, protoacetate of iron gives yellowish images, not very luminous as positives, but of matchless beauty as negatives. Protonitrate of iron, on the contrary, causes the silver to be deposited in molecules white as snow. The positives are superior in brightness to pictures upon silver; but, as negatives, the transition from the lights to the half-tones is not so well graduated as on employing protoacetate of iron.

In order to avoid the trouble of preparing these protosalts by double decomposition, I operate upon the reduced iron with excess of acetic or nitric acid, which admits of obtaining these salts in a very concentrated form; and in that state they are free from oxidation, especially if iron be left in excess. Filter and dilute with water only the quantity necessary for daily use.

The great advantage of these protosalts of iron is, that they can be poured in any manner upon the impressed plate, moist with its silver bath, without ever making any spots; because the formation of the image is slow, and there is sufficient time to cause the liquids to mix thoroughly before anything appears, and afterwards the image is developed by degrees to its greatest effect, as happens upon albumen with gallic acid; but, relatively, the time of development is very short. When protonitrate of iron is employed, towards the end of the operation, some silver spangles may be found floating upon the surface of the plate; but, if the time of exposure has been well regulated, these form upon the image lights of extreme beauty.

In all probability I shall be able, shortly, to describe the usual preparation, the use and the effects, of these two salts, which are employed, at present, mixed with protosulphate, and which are recommended by several authors, who do not know that it is waste of time, since the instantaneous reducing action of the protosulphate leaves no silver salt for the reaction of the protonitrate, and the reaction then takes place too slowly.

ON DEVELOPMENT PRINTING.

By Lyndon Smith.

[The following is a condensed extract from an article which appeared in a recent number of *Photographic Notes.*]

In experimenting with printing by development I have made, I think, a few improvements worth recording.

First as to the paper.—I obtain the best results on Canson's positive, but Turner's calotype gives good prints. Immerse the papers in this solution.

Common salt	160 grains.
Hydrochloric acid	10 drops.
Rain water	20 ounces.

Let them soak some hours, that the acid may act thoroughly. On no account omit the acid; it is essential to success with Canson's paper: if you use Turner's you may omit it. Excite by floating on a bath (in yellow light of course)—

Nitrate of silver	50 grains.
Citric acid	1 grain.
Water	1 ounce.

Allow the paper three minutes, then hang up to dry, suspending with American clips—*not pins*—by *two* corners; put a slip of blotting paper along the bottom. Let the paper become *surface* dry, and while it is still damp, place in contact with the negative as usual, and expose to light till there is a faint image; give, say three seconds in full sunshine, and ninety or one hundred seconds in dull weather, till experience shows you the exact time, which varies with every negative. Return to the dark room and develop as follows:—Turn up the edges of the print and make it into a tray and lay it on a sheet of blotting paper; then, in a clean measure-glass, put a sufficient quantity of the solution—say one ounce for a ten by eight print:—

Pyrogallic acid	2 grains.
Citric acid	1 grain.
Water	1 ounce.

Take the measure-glass in the left hand, and a glass triangle in the right, and pour the solution smartly down one side of the tray, and with the triangle spread the liquid cleverly all over the paper: this operation requires some practice, for if not performed neatly the picture will be stained, just as a collodion negative would be. The picture develops very quickly, in about the same time as a collodion negative, and must be *closely watched.* If all is right the deep shadows come up first, and strengthen considerably before the half-tones and finer details of the high lights show themselves. As soon as it looks vigorous and powerful enough—recollect the fixing *does not reduce the print at all*—take hold of the tray by two corners, and turn the devoloping solution into the waste pan, and wash the print well under the tap, then fix in

Hypo. soda	1 ounce.
Water	1 pint.

Letting the proof remain twenty minutes or half-an-hour in the bath; afterwards wash as usual—though I do not wash *as usual,* for I douse the print with a heavy stream of water from a piece of India-rubber tubing attached to the tap, where I have a heavy pressure. I squeeze the tubing between my fingers, so as to make the water *fizz* out (I cannot explain better) and direct the stream on the print which lies on the bottom of the wooden sink, turn it over repeatedly, let it soak half an hour, repeat the dousing, then take it out and dry. I think this is just as effectual in getting rid of the hypo. as soaking many hours, which softens the paper and dims the picture.

I have now detailed a process of printing positive photographs at once simple and elegant. The proofs are as vigorous and powerful as could be desired: they can be turned out with great rapidity, and are of undisputed permanence.

Finally, let us not delude ourselves that any proofs we may give of the inferiority of albumen prints will injure either the production or the sale of them, as long as we advocate a process which deprives so many "albumenisers" of occupation, and so many "photographic chemists" of large profits. We are now so much in the hands of the "professionals" that we can hardly stir without their kind permission; and there are so many nostrums and empiricisms afloat that we lose ourselves in the search for the simple principles of our art. If I could not go out for a day's quiet photographic enjoyment without being bound to use this man's "infallible preparation" of collodion, or clean my plates with "patent polish," and develop with "my formula," forwarded for the small consideration of 1s. 6d., I would not go out at all. I am happy to say I can always go out with my own collodion. I have never used any else, nor would I; and I regret now very much that a fancied necessity has induced me to use quantities of albumenised paper, about the preparation of which I knew nothing.

The Uses of Photography.—*The Times* mentions a case in which the value of photography in a commercial point of view is strikingly apparent. The Count de Penafiel left Lisbon for Paris, carrying with him an order for 70,000 francs: this, however, he unfortunately lost on the road, and telegraphed the same to his banker at Lisbon. That gentleman at once telegraphed to Paris stopping payment of the order, but sent by post the portrait of the Count de Penafiel, stating that the amount might be paid to him when he presented himself.

ON PHOTOGRAPHIC LENSES.

By Dr. Anthony.

[Address delivered at a Meeting of the Birmingham Photographic Society, Mar. 26, 1861.]

Dr. Anthony said he had much pleasure in coming forward to make some observations on lenses. Having had an opportunity of examining and working lenses by most of the best makers, he trusted what he had to say would be of a practical character; and he hoped so to pass in review the improvements and modifications which had taken place in the optical portion of photography, as to enable the artist, not only to seek for the kind of lens best adapted for his particular branch of study, but to examine and test the instrument.

He was obliged to speak of the laws of refraction, or at least to glance at them; for without some knowledge of those laws it would be impossible to understand the advantages and disadvantages of existing or proposed forms of lenses. He would first take view lenses, and the laws which regulated the proper position of the stop; then portrait lenses; and, lastly, he would take the subject of lenses more especially intended for copying prints, maps, &c., which included the new triplet lens of Mr. Dallmeyer.

Dr. Anthony drew on the diagram board a prism, and showed how a pencil of light falling upon it suffered refraction, being *always* bent towards the thick part of the prism; that the pencil of light was composed of coloured rays and of chemical rays—the primary colours being refracted in the order, red, yellow, blue, the chemical rays being proved by experiment to be the most refrangible of all, that is nearest the thick portion of the prism, and that this was important in considering the "correction" of lenses.

A double convex lens might be looked upon as two prisms placed base to base, and a double concave lens as two prisms apex to apex: a consideration of the law of refraction would show that, in the one, parallel rays of light would be made to converge towards a line passing through the bases of the prisms, and in the other they would equally be made to diverge from that line; thence it followed that, as all the parts making up a pencil of light were unequally refrangible, the rays, coloured or chemical, would all cross each other from corresponding parts of the two prisms on the central line, but at very different distances from the lens, which is looked on as composed of the two prisms.

The optician, taking advantage of glass of greater or less density, giving greater or less refraction of the pencils of light, was enabled to make up the general shape of a lens of these glasses of different density in such proportions as to "correct" for "colour," and to a considerable extent for "spherical aberration"—that is, that the coloured rays should be united again to form white light, and that the pencils falling through the circumference of the lens (and which would naturally fall shorter or nearer the lens than the central pencils) should be lengthened out, so that, if the plate for the reception of the image were a curved one, every part of the field would be equally defined.

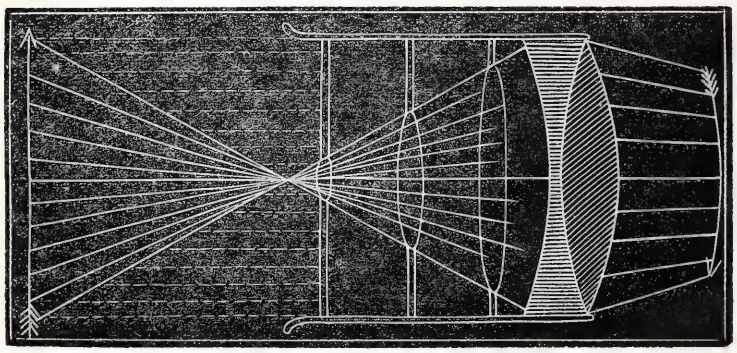
Great confusion existed in the use of the terms "spherical aberration" and "curvature of field." It was well to understand at once, that as a picture was taken on a plain surface, the centre of a picture and the sides could never be *absolutely* in focus at the same time; but, by moving the ground-glass in or out, the focus could be got (in a well corrected lens) of the sides of the picture, and the lens was only said to have "curvature of field;" but if the lens were "under-corrected" for sphericity no focus at all could be got of the sides—a quality which M. Voigtländer, who very much under-corrects for spherical aberration, believed not only to be of little importance in a portrait lens, where the centre alone was used, but to give that centre a greater "depth of focus," or, as some pleased to call it, no focus at all. The fact was mentioned there in its proper place of the under-correction of the lenses of M. Voigtländer, and as they had a world-wide reputation, and as some of the best operators preferred them in that condition, the question was not considered to be set at rest.

Every lens had two foci, which were called "conjugate," best understood by considering the sitter to be in one focus and his image on the plate in the other: these continually varied—the longest focus possible being on the horizon, giving the shortest focus between the lens and ground-glass. A knowledge of these foci and their limits was necessary for copying or enlarging, as it was evident that a point would be reached, when the lens was placed very near the object to be copied, beyond which the lens would be what was called "strained"—that is, an attempt to enlarge the object still more would only be productive of distortion. When the focus of a lens was spoken of it meant the focus for parallel rays.

Lenses were classed as positive, or those which converged the rays; and negative, or those which dispersed them. It was presumed that the meaning of the terms "double convex," "plano-convex," "meniscus," and "double concave" was known.

When that form of the front lens of a portrait combination which is nearly plano-convex, or, more correctly speaking, concavo-convex, is used as a view lens, with the flatter or slightly concave surface turned towards the landscape, and with a proper stop, its performance is not to be despised; but mathematicians, and particularly Mr. Grubb, have taken great pains to ascertain the proper curvatures and the best densities of the glass for the special construction of these meniscus view lenses, and the arrangement, as patented by Mr. Grubb, has been found to give very satisfactory results. Taking the view lens, it was manifest that the full aperture would never do; for the parallel rays falling on the circumference would come to a focus much nearer the lens than those of the centre, and so cause great confusion of the image. So a stop was employed, the aperture of which, as well as the distance at which it was placed from the lens, was of importance. Consider well why the stop was used. It was not to allow rays to pass only through the centre of the lens—because, if that were its purpose, it would be placed close up to the lens—but it was to prevent *direct* rays from falling upon the *circumference* of a lens which would be short in focus, and to cause the rays which fell on the circumference to do so at such an obliquity as to *lengthen their focus*, and so to approximate them to the focus of the central rays.

FIG. 1.

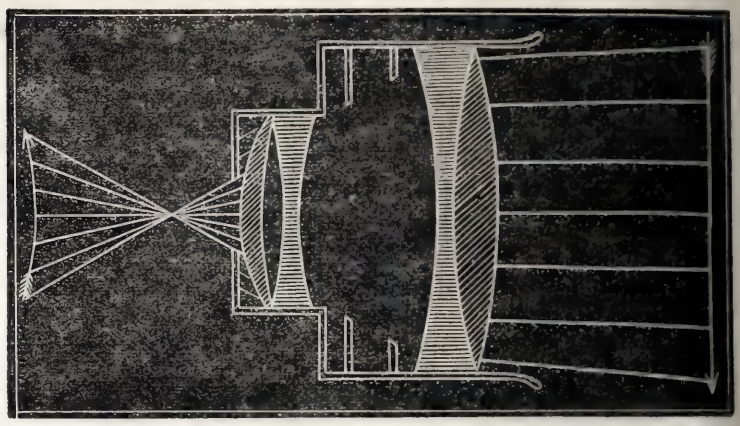


View Lens, with stops of different sizes on the cone of rays before they enter the lens.

Dr. Anthony drew a diagram (*fig.* 1) of a landscape lens in its tube, and showed that the rays from an object crossing before they entered the lens form, from the point where they crossed, a cone, the base of which was the lens itself; that, so considering it, a stop must be so placed that it would be like a ring encircling that cone. The smaller the stop the nearer the apex of the cone—that is, furthest away from the lens; and for the same reason, when copying a near object, and more light was needed, a larger stop was used, which admitted *more central pencils*. But such stop was placed nearer the lens, always at such distance that the oblique pencils fell at their best position on the edge of the lens. If a small stop was placed near, or close up, to a view lens, it simply made it into an open lens of small diameter. Many makers made the stop a fixture at about the diameter of the lens in front of it; some took it in the proportion of the focal length, and set it from one-fourth to one-sixth. The best position was found experimentally by sliding the diaphragm in the tube till the best definition was got, with *equal and full illumination* of the field. It seemed to require no explanation that the size of a lens had nothing to do with the size of a picture, which was entirely an affair of focal length. A lens the size of a sixpence would take the same sized picture as one of three inches diameter, provided their focal length was the same; but the time of exposure would be wonderfully different.

A stop placed in front of a lens caused the aberration to be of such a nature that straight parallel lines were rendered as curved towards each other—an appearance which must be familiar to photographers in old representations of houses and masts. They saw that the lines crossed before they entered the lens, and produced the so-called "barrel" shape. But, if the stop was placed behind the lens, the rays crossed after passing through, and produced an aberration in an opposite direction, called "pincushion"—that is, the lines were bowed from each other. The Petzval lens, the orthoscopic of Voigtlander, and the orthographic of Ross, all on a somewhat similar principle, had the stop behind, and so had more or less this pincushion-shaped image, which, though slight, was of some importance in copying prints or maps where the proofs had to be afterwards joined together.

FIG. 2.



Orthoscopic Lens, the stops placed on the cone of rays behind or after they quit the lens

Dr. Anthony drew a diagram (*fig.* 2) of the construction of the Petzval lens, and showed the qualities gained by the negative lens and the meniscus at the back; that the focus could be much shortened and the lines be rendered tolerably straight at the same time, conferring a most valuable quality, and one which pre-eminently distinguished them from the landscape lenses—that of *equal distribution of light over the field.* Mr. Dallmeyer had taken up a suggestion of Mr. Sutton's, with regard to a lens which should be *absolutely free from distortion:* it was very symmetrical in its character, being two plano-convexes, with their plane surfaces facing each other, and a double-concave lens between them. He (Dr. Anthony) found Mr. Dallmeyer's lens to work exceedingly well, both for copying purposes (for which it was originally intended) and for landscape and architectural subjects. One test to which it was subjected was to render, with *open aperture*, the detail of a vinery (distant thirty-five feet) and of a building (at just double the distance) at the same time; the representation of both being very fair indeed. The negative lens was made to unscrew frem the triplet so as to shorten the focus, and to work, in case of need, as a portrait lens; but there was very great sphericity, and anything like a good picture could only be got on a very small plate.

Portrait or combination lenses had the front lens a concavo-convex (generally made reversible for landscape purposes). In some, as in Jamin's lenses, the back combination was very much the largest. In others, as in Voigtländer's short-focus lens, the back lens is much the smallest; but in all the stop was placed between the lenses, the available field being thus rendered much larger, though with some sphericity. The stop placed in front of a portrait combination diminished the field; but, when placed *close up to the glass*, it flattened the field very materially—so much so, that a double combination was not a bad means of copying any small flat surface *where the light was feeble:* therefore it was seen that depth was got, with some sphericity, by a stop being placed between the lenses; and flatness of field, with little depth, by the stop being placed in front. Jamin made his lenses capable of being separated from each other, and so lessened distortion when a near object was to be copied. Voigtländer made his lenses (by preference) to have the chemical and visual foci different, so that a compensation had to be made after taking the focus in the ordinary manner. Some photographers made the compensation by recessing the ground-glass in its frame a distance which they had found it necessary to move the lens as compensation for the usual distance at which portraits were taken.

Among the makers of English lenses might be named Ross, Dallmeyer, Grubb, Slater, Shepherd, &c. Of the German makers, Voigtländer seemed to stand out conspicuously (Petzval says as a maker only); however, his portrait combination and the orthoscopic were so superior that some of the greatest photographers would use no other. The quick-acting lens of Voigtländer had a focal length of two and a-half inches, with a diameter of three inches, but with great spherical aberration, and only covered a small field, but bore stopping down well, and then worked with great brilliancy. The French makers sent in a host of lenses, cheap, and many of them good; but they should be examined, as lenses had been seen in the market which had no focus. Jamin's, and Hermagis', and Derogy's were much used. Chevalier did make some good lenses. Lerebours' were spoken favourably of by some. There did not seem very much to choose between the Petzval, the orthoscopic, the orthographic, and the triplet: they might all be regarded as copying lenses: the last seemed to be the most perfect, though many spoke very highly of Mr. Ross's orthographic.

In choosing a lens, the colour of the glass of which it was made must be of importance—that of a yellowish cast to be avoided. All lenses covered fairly a certain sized plate, and then what was called fell off towards the edges. For equal apertures, and equal focal length, the lens which would cover the *largest area distinctly* was the best. It was a point to observe by pushing in and drawing out the ground glass, if the sides of the picture could be got into good focus alternately with the centre, when the lens was used with the full aperture. Few lenses were of universal application: the attempt which some opticians made to combine all sorts of capabilities, in compliance with the wishes of customers, was rarely productive

of anything but disappointment in the end. There was one law with respect to lenses which was specially worthy of note—that was, that the shorter the focus of the lens the greater number of planes it would render in focus at the same time; as, for example, the short-focussed stereoscopic view lenses of Ross would give every distance from the foreground to the horizon. The beautiful landscapes of Mr. Vernon Heath, in this year's Exhibition, were taken, he tells us, with a Grubb's view lens.

THIRD REPORT OF THE EXPERIMENTAL COMMITTEE OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

In this report the Committee do not aim at exhausting the subject of dry plate photography. They propose only to report on those which they consider available for general out-door work.

During the coming season it is their intention practically to test these different processes, one against the other, to a greater extent than the nature of the weather has hitherto enabled them. In the meantime they place before the Society the result of their investigations so far in the several processes following.

The Taupenôt, or Original Collodio-Albumen Process.

This process, on the whole, is considered an exceedingly satisfactory one, although there are certain difficulties attending it which will ever prevent its becoming a general favourite with the amateur.

Particulars of Manipulation.—Sensitise in the ordinary manner, using any collodion, provided it is not too thick, and *thoroughly* wash under a stream of running water. It is not necessary to use distilled water for this purpose. Iodised albumen is now to be poured over the washed collodion surface. This albumen is prepared as follows:—

Albumen	1 ounce.
Water	½ ,,
Iodide of potassium	5 grains.
Bromide of potassium	1 ,,
Ammonia	10 minims.

Dissolve the iodide and bromide in the water, then add the ammonia. Mix altogether with the albumen, and beat the whole into a froth and allow to settle, when the clear portion may be poured into a stock-bottle for use.

Air bubbles must be carefully avoided, and the excess of the portion of albumen taken from each plate should not be returned to the stock-bottle, but placed in a separate receptacle for future use. It should not, however, be used more than two or three times, as after that it becomes too dilute. Allow the plate to drain on one corner five or ten minutes; then dry rapidly before a clear bright fire, and make it quite hot. This tends to prevent blistering in development.

In this state the plates are insensitive to light, and may be kept for years. This keeping quality is very convenient, as it enables the photographer to prepare, during the winter months, a stock for the summer season.

To sensitise these plates, immerse them in aceto-nitrate of silver, prepared as follows:—

Nitrate of silver	40 grains.
Acetic acid	½ drachm.
Water	1 ounce.

And again thoroughly wash. The amount of washing, however great, does not seem to lessen sensitiveness, but adds to the keeping qualities.

Development is best effected with gallic acid. Put the plate, face upwards, in a dish, with sufficient of a saturated solution of the gallic acid to cover it. When it has remained five or ten minutes, add a few drops of silver solution, and mix well in the dish; the picture will gradually appear. When all the details are out, add more silver till the development is complete. Fix in hyposulphite of soda.

The above method of manipulating is that followed by Mr. Mudd. Your presentation print of this year is a proof that in such hands as his the process leaves but little to be desired.

Those members of the Committee who have given the process a fair trial are of opinion that it is uniform and certain in its results, and possesses many advantages peculiarly its own, not the least of which is the allowing of long exposure to bring out detail in the shadows, without fear that the more strongly-lighted parts will be overdone. It permits of the ready removal of stains during development, the film being so hard that a camel-hair brush may be used for that purpose.

On the other hand, the use of the second bath involves considerable additional trouble: the plates, unless carefully prepared, are liable to blistering of the film; and, after the final sensitising, their keeping properties are limited. This latter inconvenience, however, may be remedied by washing in salt and water, then in plain water, and finally applying tannin or gallic acid to restore intensity. But all this tends further to complicate an already not over simple process.

Nevertheless, to those who do not object to the trouble of preparation, the Committee have not the slightest hesitation in recommending the Taupenôt process as safe, and, with proper manipulation, unsurpassed in its results.

The Fothergill Process.

Of all the dry processes this, perhaps, is in more general use than any other. Its simplicity and certainty, particularly for small plates, especially recommends it to the amateur.

The following are individual opinions of some of the Committee who have been in the habit of adopting this process:—

Mr. Borchert describes it as being "the best process, with *little* washing for highly sensitive plates, with *long* washing for keeping plates of average sensitiveness." Mr. Martin says, "my practice has been confined almost exclusively to Fothergill's original process, with which I have been very successful. I like it for its simplicity, and shall continue to practise it." In Mr. Clark's hands "the process has proved very successful, more so indeed than any other. The exposure is short, compared with many other processes."

With some of the Committee there appears, however, to be a difficulty in obtaining a surface of uniform sensitiveness and intensity, more particularly with large plates. Mr. Davis says "the difficulty of obtaining an evenly sensitive film of albumenised nitrate of silver affords a decided impediment to the successful practice of the process." Mr. Hannaford, in order to overcome this difficulty, recommends the use of a second bath of nitrate of silver, of the strength of about five grains to the ounce. The plate, when taken from the sensitising bath, is to be thoroughly washed, and then immersed in the weak bath, by which means a more uniform coating of free silver is got on the plate than by the ordinary method of washing with a limited quantity of water, or until greasiness disappears. He also calls attention to the modification of this process, which will be given presently.

Particulars of Manipulation.—Numberless modifications of the Fothergill process have from time to time been given: the Committee, however, prefer the following simple plan, which is more generally used than any other, and which is thus described by their colleague, Mr. Clark:—

"The modification I have adopted is that of washing the plate freely after sensitising, in any quantity of water, until the greasiness entirely disappears. I then pour on one corner of the plate sufficient albumen solution to flow freely over to the other end: this forces the water before it. I then place it on the levelling stand, and pour a second quantity of albumen on, and allow it so to stand while I coat another plate. It is then washed in a large quantity of water, and stood to dry. My albumen solution consists of one of albumen to three of water, and half an ounce of ammonia to the pint: it is beaten well up, allowed to settle, and decanted. I prefer this to filtration."

This method is similar to that lately described to you by Mr. Howard, in his eminently practical paper, read at the February meeting of this Society.

The addition of chloride, or a citrate, to the albumen is advantageous in certain circumstances, such as if over-intensity be complained of; but the above simple plan will be found to give the most charming results.

The following modification of this process has been proposed by Mr. Hannaford:—

Mr. Hannaford's Modification of the Fothergill Process.

Many complain that in preparing large plates by the Fothergill process they experience difficulty in obtaining a surface producing equal sensitiveness and intensity throughout. This difficulty I had to a considerable extent got rid of by thoroughly washing on removal from the sensitising bath, and afterwards redipping in a second bath containing about five grains of silver to the ounce. But this method, evidently involving a multiplicity of operations, and the true beauty of the Fothergill process being its simplicity, I have been induced to make some experiments having for their aim the reducing of the process to as simple a form as possible, so as at the same time to obtain the best results.

These experiments have not been carried to the extent I purpose, and I cannot therefore give the exact formula in the modification I am about to suggest; nevertheless, I trust my remarks will not be without some degree of interest to the Society.

The first point to which I directed inquiry was this:—What action ensues on applying the albumen preservative to the partially-washed plate? It is very generally supposed that the free silver remaining on the film is thrown down as an albuminate; and, therefore, as the amount of washing the plate receives regulates the quantity of this albuminate, thereby affecting the sensitiveness and intensity of the film, we have received various instructions respecting this part of the manipulation ranging from the "four drachm" to the "unlimited."

Now, it will be found that if we place, say, half an ounce of albumen mixture in a glass, and add a drop or two of our silver bath, the white precipitate at first found is almost immediately redissolved by the ammonia in the solution. The same action ensues on the albumen coming in contact with the free silver on the partially-washed plate. But it is evident that the ammonia becoming weakened by partial saturation, as it flows on over a large surface, its action is not equal at all parts.

Again, following the same line of reasoning, we may consider that no albuminate of silver remains on the plate when finished but while still wet. The film, I think, mechanically retains a part of the albumen, which in its turn mechanically holds a portion of the silver in combination with ammonia. It is possible, however, that the salt may be a double one of ammonio-nitrate of silver, and albuminate of silver. Whatever it is, we no doubt get a soluble, instead of an insoluble salt, and which on evaporation of the ammonia combines again with the albumen to form albuminate of silver. Thus, whilst wet, we have the soluble salt, but when

dry, so that the ammonia has evaporated, the albuminate of silver is formed in the pores of the film.

Reasoning in this manner, it at once struck me that to form this silver compound in the albumen mixture would be much neater than obtaining the same thing at random on the film. This I did by adding nitrate of silver as long as the precipitate would dissolve.

In order that you may be enabled, should you desire so to do, to follow out my suggestions, I will give you the plan by which, so far, I have best succeeded:—

Particulars of Manipulation.—To the white of one egg add three ounces of water, and about twelve minims of ammonia. This, well beaten, is the ordinary albumen mixture for Fothergill plates. Now add silver solution, drop by drop: at first a white precipitate is formed, but quickly re-dissolved. Directly, however, this albuminate of silver is no longer so dissolved, cease. The mixture should present a slightly milky appearance, and in this state may be kept some time. Its keeping qualities will, however, be better with the addition of just ammonia enough to re-dissolve the milky precipitate, and in this state, I think, it works cleaner. Any "mealy" collodion giving good results in the wet state, may be used. After sensitising *thoroughly*, wash in an unlimited quantity of water. Then pour on the albumen mixture, and allow it to flow over the plate for about a minute. Again throughly wash, and dry.

It is not needful that the albumen should be removed by washing. In this case the mixture should be quite clear, ammonia being *slightly* in excess. This plan gives all the simplicity which is claimed for the tannin process without its disadvantage of the danger of losing the film. Development of these latter plates is tedious, but the former come out readily and intensify to any desired extent.

Petschler and Mann's Process.

In the hands of the Committee this process has not come up to what it at first appearance promised. It is less satisfactory in its results than the Taupenôt process, liable in a greater degree to a blistering of the film, and not capable of being exposed to diffused light with impunity when in the "insensitive" state.

The Committee have to thank Mr. Mann for the courteous manner in which he has afforded them information during the course of their experiments.

Mr. Davis's Collodio-Albumen Process.

This formula is described by those of the Committee who have tried it as being extremely simple and certain, producing the best results, although at a trifling loss of sensitiveness. By thoroughly washing the film in common water Mr. Davis concludes that every particle of the free nitrate is either removed or converted into an insoluble salt of silver; so that on the application of the preservative no combination of silver with albumen is formed. Intensity is secured by the addition of glucose.

The Particulars of Manipulation, as given by Mr. Davis, are as follow:—

In the second communication from the Experimental Committee a formula was given for a sensitising solution which I found to work very satisfactorily when added to a suitable plain collodion. I will, however, take this opportunity of remarking that, any collodion that combines with an appropriate mechanical structure the capacity of giving an abundance of half-tone, is equally suitable for this as any other dry process. The plate, after having been covered with such a collodion, is to be excited in the usual 35-grain nitrate of silver bath, and then to be washed freely in a dish (or otherwise) with two or three quantities of common filtered water. In cases when the ordinary water contains organic impurities, it will be found preferable to wash with a very dilute solution of chloride of ammonium in distilled water. The film is now to be covered with the following preservative mixture:—

Albumen.....	1 ounce.
Ammonia	10 minims.
Glucose	½ ounce.
Water	1 ounce.

Dissolve the glucose, in the first instance, in the water, next filter, and then add it to the albumen, previously well beaten or otherwise frothed. This preservative solution will keep for a lengthened period, and, after having been prepared for a few days, will readily filter through common filtering-paper. This latter operation should be repeated immediately before applying it to the plate, the liquid should then possess the brilliancy and appearance of amber-coloured collodion. Pour the first quantity along one edge of the plate, allow it to flow towards the other in a continuous wave, and pour off from one of the corners; re-cover with a second quantity, which should remain thereupon for about a minute. The plate is then to be washed freely with water, and stood on end to dry.

Gelatine Process.

This process is capable of producing good results, but is not so generally a favourite with the Committee as those previously described.

Particulars of Manipulation.—Well wash the excited plate and then coat with a solution of gelatine, made by dissolving eighty grains of gelatine in a pint of water, and boiling down to half the quantity, filtering, and, when cooled a little, adding one ounce of alcohol. This solution must be heated upon being applied, which is most conveniently done by standing the bottle containing it in a jug of warm water.

The Tannin Process.

From this process having so recently come before the public the Committee have not had opportunity to test it to the extent they desire. Mr. Davis remarks respecting it:—"The simplicity and readiness with which the latent image can be developed commends it to a full experimental consideration. The necessity of rendering the film sufficiently adherent to the glass when working upon medium size (10 by 8 plates) without complicating the process, and the lengthened exposure required under the same conditions, offer the obvious difficulties to be surmounted in connexion with this process." Mr. Borchert recommends a five-grain solution only, as he considers the tendency of the film to wash away to be less in that case than when using a stronger solution of tannin. He adds:—"All preparations containing tannin (as leather) are very apt, in a dampish atmosphere, to engender fungus. This will have something to do with the keeping qualities. I have noticed marks of fungus in old gelatine plates although they were put perfectly dry into the boxes."

Pending the publication of the promised treatise by Major Russell, the Committee reserve their opinion on this process, only adding the following remarks by Mr. Hannaford:—"Collodion for tannin prints may be of two directly opposite kinds: the first, and probably the best, partakes of the 'mealy' nature to a very great extent, almost approaching to rottenness; this sample will be found to adhere to the glass with tolerable firmness. It should be strongly bromidised, and the alcohol and ether should contain as much water as possible.

"The second collodion may be of directly the opposite character. I have prepared a sample giving good results, which is so firm that the film can almost be lifted from the glass without breaking. It contains but a small quantity of water and very little bromide. This sample, on being varnished round the edges, will bear a considerable amount of washing."

Particulars of Manipulation.—Thoroughly wash the sensitised plate, so as to remove every trace of nitrate of silver; coat with solution of tannin, five to twenty grains to the ounce. Dry as usual.

There is so much in this process that is promising that the Committee propose giving it a fair practical trial during the coming summer months.

General Processes.

The Committee having now entered at some length into those processes which they consider the best, it will be sufficient, perhaps, to allude but shortly to some others which have been placed before the public from time to time.

The malt, glucose, linseed, raspberry syrup, metagelatine, &c., processes are each capable of yielding good results, but are severally open to the objection that the preservative media do not assist in retaining the collodion film in contact with the surface of the glass.

The resin process, from its extreme simplicity, is well worthy of attention. It has not yet received sufficient trial from the Committee to be spoken of with certainty.

Concluding Remarks.

In this report the Committee have given what in their experience has proved the best formula in the several dry processes which they consider will be most generally followed.

As a body, they are inclined to give the preference and recommend the Fothergill and Mr. Davis's processes: the tannin process, and Mr. Hannaford's modification of the Fothergill, they consider promising, but would at present more particularly call the attention of the experimental members of the Society to them.

During the summer months the Committee purpose continuing their experiments in the preparation of extra-sensitive plates. They however only here attempt to report on the good working processes, from which the members of the Society may make a selection, now that the season for out-door work has commenced.

ON THE COLLODION PROCESS: ITS PURSUIT UNDER DIFFICULTIES.

By D. Brown.

[Read at a Meeting of the City of Glasgow and West of Scotland Photographic Society, April 4th, 1861.]

At the request of the Committee I beg to contribute my mite to the photographic literature of this Society. Perhaps I may be the means of encouraging some of those who are far more qualified then I am, by their daily experience, to go into the details of photography.

Instead of commenting on the high position that this art has attained, and laying before you specimens of its wonderful perfection, I feel it will be much wiser in me to leave that part of the subject to some of our more advanced members, especially those amongst you who have studied the chemistry of the different compounds, and can so nicely detect an error of a minim, or the fraction of a grain, to the ounce. I will rather go back to the good old days when photography was in its infancy, and before the actinic rays had bleached my locks "wi' siller grey."

It was, I think, about the year 1848, that I first thought of trying my hand at photography. A young acquaintance of mine had made a box, and we purchased a lens, which cost only a few pence, fitted it to the box with a paper tube, and set to work with great glee. But my partner,

who was engaged all day, could spare no time except in the evenings. I happened to be more fortunate, as I generally had more time throughout the day, and went on with the experiments, and we discussed them fully in the evenings together.

The first process with which we commenced was the calotype, following the formula given in the *Art Union* Journal of June, 1846; but after many trials, and about as many failures, we gave it up in despair. The cause of failure was, as I found out afterwards, partly owing to the actinic focus not being adjusted, of which we knew nothing at that time.

I very soon after this procured a quarter-plate camera, with a good lens, which had been used by a lady for taking Daguerreotypes in this city. I also got some books containing improved formulæ, and began again, and arrived at great success (at least I thought so at the time). Some of the results I now lay before you in iodised paper, negatives, &c. Recollect it was slow work in those days: an exposure of from one to two minutes, in the sun's rays, was then necessary. You will see by one of the specimens that I had the cruelty to make the gentleman sit in the full blaze of the sun!

I need not enter into the details of the old paper process, as you will all be quite conversant with the different solutions: I will only say a few words on the way I was most successful in manipulation. After iodising the paper according to the directions, I got a pair of porcelain slabs and two glass rods, laid on them a piece of clean blotting-paper, a little larger than the iodised paper, which I laid on it; set the glass rod across the top; poured on close to the rod a few drops of the gallo-nitrate of silver, moved the rod backwards and forwards till the solution spread along to the edges of the paper, then brought the rod to the foot of the slab, and generally got a very even coating by this plan. I also developed in the same manner.

I now come to the great revival in the art on the discovery of the Collodion Process. It was in the latter end of 1851 that persons who had been at the Great Exhibition told me of the collodion pictures shown there, and advised me to try the process. I found a very good description given in the *Art Journal* of July of that year.

You may imagine with what sanguine hopes I prepared to try my hand; but where was I to find materials, especially the collodion? There were no establishments in Glasgow at that time where ready-made materials for the collodion process could be procured, and I knew not how to make them up, as I had no knowledge of chemistry. I at last mustered up courage, and consulted Dr. Paterson, the friend of the photographer in distress—a gentleman who did more for the art in its early stages than any that I know of in the West of Scotland, and a gentleman who well deserves to be numbered amongst the honorary members of this Society.

Dr. Paterson, in his own kind manner, showed me how to prepare the cotton. As far as I can remember it was thus:—

Dried nitrate of potash	½ ounce.
Sulphuric acid	¾ ,,
Cotton	½ drachm.

It was mixed with a glass rod till saturated, allowed to soak for eight or ten minutes, washed, and dried. He at the same time gave me a little cotton to make the collodion with; also instructions how to make up the different compounds.

I then set off with a light heart, with the doctor's prescription, to the Apothecaries' Hall, procured the different materials, got home, made them up, waited with no small share of patience for a good day. With the first opportunity I set to work—failed over and over again—till at last I got something like Nos. 1 and 2, which a gentleman of my acquaintance used to characterise as belonging to the coal trade!

I may as well detail here what materials I used in the different solutions. The silver bath contained thirty grains to the ounce. We had no idea of saturating the bath with iodide of potassium then; hence the cause of failures at first. The collodion simply contained—ether 1 ounce, alcohol 2 drachms, cotton 10 grains, iodide of potassium as much as it would take up; the whole shaken well and allowed to stand till settled. Developer:—Pyrogallic acid 3 grains, water 1 ounce, glacial acetic acid 1 drachm, nitric acid 2 drops. The fixing solution was hyposulphite of soda. Pyrogallic acid was rather an expensive developer at that time. It was good for us we had no shilling pictures then, as it cost something more than twenty shillings per ounce.

In the *Mechanics' Journal* of December of that year a formula for the iron developer was published. A great boon it proved to be! It was much cheaper, and more rapid in its action. I think the cyanide was used about that time. No. 3 is a specimen of this process. You will perceive it is full of deep shadows, little or no half-tints, hard, and metallic. The want of the bromides was the cause of this. To remedy this defect I mixed the pyrogallic and the iron solutions: the result is seen in No. 4, &c. I think the bromide was used shortly after this time.

No. 5 is a specimen of another developer that I got some time afterwards—the protonitrate of iron. It consisted of—iron 20 grains, water 1 ounce, nitrate of lead 16 grains, formic acid ½ drachm, sulphuric acid 2 drops. I frequently use the same developer to this day, and have got very good negatives with it, under favourable circumstances.

A few words on the manipulation of the collodion process, and I have done. I wish, however, to state here that the remarks which I now submit to you are the result of recent experiments, and that I have had the advantage of comparing notes with a brother photographer while doing so.

In coating the plate with collodion, as a matter of course we must pour it off at one end. If the material be thick, it will be still more so by evaporation of the ether, and consequently the layer of collodion is thicker at the end we pour off at. A plan I have adopted to counteract this is to place the thin end so as to correspond with the sitter's head, as the light is strongest on the upper part of the sitter.

Another plan, which I think better still where a uniform coating is necessary, is to thin the collodion and coat the plate *twice*, reversing its ends. This will be shown when copying engravings, or where a uniform surface is required all over the plate. I would recommend this double coating with thin collodion for views also.

I am afraid to enter on that much-vexed question—the nitrate bath: how to keep it right, or, when wrong (as it often is), how to put it right. There has been so much said and written on the subject, it would be presumption in me to attempt to enlighten you on it; but, with working a gold bath, there is a great deal more than many are aware of in the time one allows the plate to stand in it. For instance, if you allow the plate only say from a minute to a minute and a-half, you will get a much clearer picture—that is, clearer in the lights and deeper in the shadows—than if left for three or four minutes; although the longer time in the bath has its advantages when taken in proper time—say, for instance, in photographing a clump of trees in full foliage, or the deep recesses of a dark glen, where the lights and shadows are in strong contrast, you will get much better harmony and nicer details, with less chance of the high lights being solarised.

Such, gentlemen, is an imperfect sketch of an amateur's earlier and later experiments in photography. I hope the day is not far distant when I shall have the pleasure of hearing some of you following up these remarks.

An Alleged Instantaneous Process. By *L. M. Dornbach.*—It is always desirable that the photographer should have at his command the means to take that limited class of pictures or views in which there are moving objects, such as street views, vessels in motion, &c. For this object different methods, called instantaneous processes, have been devised. The following is one that has never been published, and gives very good results:—

The first thing to be done is to make a very sensitive alcoholic collodion as follows:—To 4 fluid ounces of sulphuric ether, sp. gr. ·720, add 4 fluid oz. of 95 per cent. alcohol; in this dissolve 140 grains of soluble cotton made in rather weak acids, so that it has a short structure, and, when all dissolved, add 12 fluid ounces more of alcohol, which finishes the plain collodion. To 20 ounces of this collodion add 2 fluid drachms of a saturated solution in water of iodide of potassium, and 30 grains of bromide of cadmium; allow the undissolved particles held in suspension to subside, and the collodion is complete. Use a neutral 45-grain nitrate of silver bath; develop with water 16 ounces, protosulphate of iron 1 ounce, acetic acid (No. 8), 1 ounce, alcohol 1 ounce: fix the picture, as usually done, with cyanide of potassium. When the picture has been thus far complete it lacks the required degree of intensity for a negative, and the following method is resorted to for securing this object:—

After it has been fixed and well washed, pour over the plate a saturated solution of bichloride of mercury, after which wash the plate well; then pour over it some water in which 2 or 3 grains of iodide of potassium or iodide of ammonium (which is the best) has been added to the ounce, when the plate is to be again well washed. If the intensity is not sufficient, this process is repeated until the required intensity is obtained.—*Humphrey's Journal.*

GROUPING LARGE NUMBERS.

It is probable that most of our readers are familiar with the engraving from a celebrated picture, purporting to represent the *Waterloo Banquet*, and containing the likenesses of the various partakers in the entertainment. There are but few who have any sentiment for art (to say nothing of proficients therein), who have not instinctively felt that very numerous offences against good taste have been committed in the grouping and posing of the various figures. It is, no doubt, partly owing to the necessity of introducing the features of the respective individuals that constraint of attitude has arisen, and in consequence of the large number of persons comprising the group, not only are the strained portions very conspicuous, but they tend also to increase the bad effect by exaggerated contrast. When the picture itself was painted there was no photography to assist the artist, who clearly had to work up his subject without the aid of the originals, except for the features, and they could not have adopted the attitudes assumed by some of the figures, even had they been so inclined.

In all large groups, consisting entirely of the male sex, it must be very difficult to produce much artistic effect; but especially when they are all very busily occupied in doing—nothing. However

an attempt has been made by Mr. Brothers, of Manchester, to accomplish this by photography, assisted by the device of printing portions from various negatives, and with considerable success. A local critic wrote lately as follows in the *Manchester Review*:—

Visitors to the Photographic Gallery, the establishment of Mr. Brothers, 14, St. Ann's Square, have recently enjoyed a treat of no ordinary description, in the inspection of a splendid triumph of photographic art. The work in question is a group, composed of the officers of the 84th Regiment, at present quartered in this city. The picture contains between forty and fifty portraits; the resemblances are said to be perfect, the scientific portion of the process of taking has evidently been a success of the very highest degree, and the artistic taste and skill of the subsequent manipulation at once command the admiration of the uninstructed eye, and challenge and defy the closest scrutiny of the regularly trained artist to detect a fault. In most works of the kind, however faultless the proper work of the artist, the grouping is more or less faulty, and in many cases it is exceedingly so; but the same taste and skill have, in this instance, been brought to bear on the mechanical arrangement of the subjects as on the transference of the portraits to the plate, and the natural and unconstrained expression of the figures consequently contributes, in no small degree, to the effectiveness and picturesqueness of the *tout ensemble*. The attitudes are remarkable for the entire absence equally of the starched and studied stiffness, and of the still more offensive studied negligence, which are so frequently apparent in works of this kind; and all the minor accessories of the picture have been produced with a corresponding degree of taste, skill, and carefulness of elaboration, so that the whole constitutes one of the greatest triumphs hitherto achieved in the department of art to which it belongs.

We have been favoured with a small paper copy of the work, and judging from that we must admit that considerable artistic skill and taste have been displayed; but we are of opinion that the same operator could, on a future occasion, produce a still better work by the same means, if he would break up his group into several smaller ones, and place some nearer, and some more distant, so as not to have all nearly in one plane. Rome was not built in a day, and the present work is decidedly a step in advance of most similar subjects that we have seen.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Society was held on Wednesday evening, the 24th ult., at eight o'clock, at Myddleton Hall, Islington—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The following new members were proposed and declared duly elected:—Major Burt, R.A., Messrs. T. Allender, J. Harrison, E. Steegmann, and — Purnell.

Mr. Barber read a paper *On the Neutralisation of the Nitrate of Silver Bath by Carbonated Alkalies* [see page 159], for which the thanks of the meeting were awarded him. Afterwards he said he had expressed himself more strongly on one point than he otherwise would have done, in consequence of one of the photographic authorities stating it to be, in his opinion, a mistake to neutralise the bath with oxide of silver. Now, he (Mr. Barber) could not see the mistake, as it was certainly more scientific to use the oxide than the carbonate in the bath; because, by putting in the oxide, they were only putting in more silver, whilst the carbonate formed nitrate of soda—not that he thought the latter would practically injure the bath, but still it was putting in foreign matter, which ought if possible to be avoided.

Mr. Dawson agreed with Mr. Barber respecting the advantage of using oxide in neutralising the bath. He had tried ammonia, carbonate of soda, and other neutralisers, but had found none of them so good as the oxide, as the only part of it that would be dissolved out would be the pure silver, by the excess of nitric acid in the bath. Chemically speaking it was perfect, and practically speaking it was the best plan he had ever adopted. With regard to recrystallisation, he thought that by repeated recrystallisation the organic matter was removed. He had tried it often, and he always found the first crop of crystals to be purer than those which were subsequently obtained from the same solution. The "mother liquor" would retain the organic matter, but it could subsequently be used for printing.

The Chairman thought Mr. Barber's remarks applied peculiarly to freeing the nitrate of silver from organic matter.

Mr. Barber said his remarks applied equally to getting rid of the nitric acid. A good deal might be got off by boiling. It was also got rid of by crystallisation.

Mr. Dawson had not found it so difficult to buy good nitrate of silver as was generally supposed, that which he had bought being adulterated solely with water and nitric acid. The best way to drive off the nitric acid when pure nitrate was desired was to pound down the crystals, and to keep them for a few hours in a shallow dish over hot water. A solution made from crystals thus prepared would be found perfectly neutral. He had met with a singular accident a short time ago, which showed the fallacy of the general supposition that nitrate of silver could not be decomposed into nitrite except at a high temperature. One Saturday he happened to put some nitrate of silver slightly acid into a shallow basin in a water bath over a gas jet, and he entirely forgot it until the following Monday, when he found the nitrate of silver, which during that time could not possibly have been at a higher temperature than that of boiling water, was in part converted into nitrite. When he made a solution from those crystals it was decidedly alkaline. The conclusion he arrived at upon the subject was that long-continued moderate heat would decompose the nitrate of silver, whilst a shorter exposure, such as five or six hours, would produce no such effect. He did not like fused nitrate, as every specimen he had seen contained nitrite, and he did not think it was possible to fuse it without forming nitrite.

Mr. Sutton having been called upon by the Chairman to reply to Mr. Barber's remarks on the use of oxide of silver as a neutraliser, stated that he had made many inquiries of Mr. John Williams respecting the manufacture of nitrate of silver and the nature of the residue left on re-crystallising the nitrate of silver. [See *Letters to a Photographic Friend*, Vol. VII., page 242; and Mr. Hardwich's *Photographic Comments*, page 342.] Mr. John Williams questioned the contaminating body being organic matter, as he thought the process of fusion would destroy all organic matter; but said that a sulphate of silver was formed, for he found sulphur to be present in the residue referred to, which might be traced to the sulphuric acid always present in commercial nitric acid. The way, therefore, to make pure nitrate of silver was (in Mr. Williams's opinion) to get pure granulated silver in the first place, and then to get pure nitric acid. To obtain the latter, any nitric acid might be taken, it did not much matter how impure, and add to it nitrate of baryta, which would precipitate the sulphate and leave the nitric acid pure: dissolve in it the pure silver, and there was then obtained pure nitrate of silver. In recrystallising this nitrate of silver they would not get colourless crystals, unless they added to the solution a very few drops of nitric acid, just sufficient to give very slight acidity.

Mr. Barber, with respect to the presence of sulphate of silver, said that would be easily tested by adding nitrate or baryta to the bath. He thought the appearance was much more likely to be owing to the presence of organic matter, as when a bath had been worked for some time and was overcharged with organic matter, ether, or spirit, he found it produced the streaks, &c.

Mr. Dawson said he might take this opportunity for stating that he thought it impossible to make nitrate of silver from spongy silver reduced from the chloride or oxide. He lately had about a pound of waste chloride of silver, which he reduced to spongy silver by adding zinc: after washing it he added rather an excess of sulphuric acid to remove the zinc. He evaporated the liquor, and then washed the precipitate until all trace of acidity disappeared. He then added nitric acid, and placed the solution in an evaporating dish and kept it over a water bath until it was concentrated to the thickness of a syrup. He then made a solution, equalling about the strength of ninety grains to the ounce, for printing purposes; and he was much surprised to find that it became turbid, which he could not account for, seeing that the liquor was perfectly clear. He left it to stand, and the day before he had collected a quantity of white cloudy matter off it, which he found to be chloride of silver. It evidently arose from some of the chloride not being sufficiently reduced by the zinc. He had to reduce the whole bath to chloride, and he did not think it was possible to completely reduce the chloride of silver by means of zinc. Spongy silver should not, therefore, be used for making nitrate of silver: it should always be fused, with a little lime and charcoal mixed with it, when it would form perfectly pure silver.

Mr. Hughes had met with an exactly similar effect. Having a quantity of chloride of silver he had reduced it to spongy silver by the ordinary zinc method, and had then redissolved it in nitric acid, filtered it, and, on diluting it to a working strength, to his astonishment down fell a quantity of precipitate, notwithstanding the previous filtration, showing that the chloride of silver was soluble in the strong nitrate of silver.

Mr. Sutton asked whether it was not sulphate of silver which was precipitated, as chloride of silver was not soluble in nitric acid?

The Chairman thought it was a pretty wellknown fact that chloride of silver was, to a certain extent, soluble in a concentrated solution of nitrate of silver. There was one point to which Mr. Sutton had not referred: Mr. Barber's paper appeared to him to be directed against some observations made by Mr. Sutton, who depreciated the employment of oxide of silver in neutralising the bath; would Mr. Sutton favour them with his views upon the subject?

Mr. Sutton said when oxide was added there was always a great chance that too much would be put into the bath; and then, to counteract that, too much nitric acid would be added, and so on, over and over again: whereas, when carbonate of soda was used in excess, carbonate of silver was thrown down, which, unlike the oxide, was not soluble in water, and thus there was not much trouble about the matter.

The Chairman: Provided all the carbonic acid was evaporated from the bath, that plan would answer well enough.

Mr. Sutton said he thought that was got rid of in filtering.

Mr. Dawson did not see any reason for adding an excess of oxide to the bath. It could be added in infinitesimal quantities.

Mr. Sutton replied that the smallest excess would produce fogging.

Mr. Barber inquired whether Mr. Sutton considered it necessary to have his bath a little acid to make it work well, as he could not obtain satisfactory results with a perfectly neutral bath?

Mr. Sutton replied that the collodion he employed made his bath a little acid.

Mr. Dawson, in answer to Mr. Barber, said the best pictures might be obtained with an absolutely neutral bath.

Mr. Simpson said when the bath was absolutely neutral every thing must be in the most perfect condition, as the presence of the smallest amount of foreign matter was sure to be indicated on the plate. The collodion must be good, and the manipulation careful.

The Chairman and Mr. Dawson expressed opinions that, if sulphate of silver had been present in the residue referred to by Mr. Sutton in any appreciable quantity, its presence would have been indicated very decidedly on the addition of nitrate of baryta, and this did not seem to have been the case. Also, that sulphuric acid would not attack silver if there were an excess of nitric acid present.

Mr. Simpson said Mr. Sutton suggested that when there was silver in excess, and the nitric acid was exhausted, the sulphuric acid, if any were present, would begin to act upon the remaining silver.

The Chairman said even in that case the sulphuric acid would not attack the excess of pure silver: to do so it must be oxidised.

Mr. Sutton said the silver would become oxidised by the oxygen of the nitric acid. The fact that Mr. Williams *had* found sulphuric in the nitric acid was most important, and must not be overlooked. They must not be misled by theory when it went against practice. He would not stick exactly to the word *sulphate* of silver; it might be sulphite, sulphide, or some other combination of sulphur with the silver.

The Chairman said they only disputed the presence of *sulphate*. He could easily see the possibility of *sulphide* of silver being present.

Mr. Highley observed that when the attention of photographers was first called to the peculiar residue that was left in the evaporating dish after recrystallising nitrate of silver, Mr. Hardwich had carefully experimented on the nature of this residue, and, in one of his "Comments," had expressed an opinion that the colouring body was attributable to organic matter.

The Chairman said Mr. Hardwich had experimented as to the presence of organic matter only—not as to the presence of sulphur compounds.

Mr. Hughes said the question might be easily decided by adding sulphur in some form to a nitrate bath, which ought to produce exactly the same results and appearances alluded to by Mr. Sutton, if his supposition were correct. That would be the complement to Mr. Williams's experiments, and would decide the question definitely—*if* any martyr to science would spoil his bath for that purpose.

Mr. Barber remarked that the more acid a nitrate bath was the more organic matter it would hold in solution.

Mr. Dawson proceeded to explain his method of correcting his Table of Specific Gravity [see page 161], and exhibited the various instruments he employed, including some made by himself, and a very delicately-constructed pipette, graduated to every single minim up to 480 grains, which had been constructed by Messrs. Negretti and Zambra.

Mr. Hughes thought they ought not to separate without expressing their admiration of the wonderful patience and accuracy exhibited by Mr. Dawson in the table of elaborate calculations he had that evening laid before them. It must not be supposed that he had done it out of mere whim; for he had conferred a great benefit upon photographers in telling them what that eternal grain of nitrate of silver—by which all their calculations were made—was really worth, and what it stood for. It was a great fact he had discovered, viz., that the larger the amount of nitrate of silver in the solution the less was the comparative specific gravity. The discussion started by himself respecting nitrate of silver had been productive of much good, and he was sure had greatly benefited the photographic world.

The thanks of the meeting were voted to Mr. Dawson for his valuable communications.

The Chairman placed on the table one of Mr. Highley's dropping bottles for nitrate of silver solution, described at page 147 of the present volume. He also announced that the committee had been taking into consideration the propriety of altering the day of meeting from the last Wednesday in the month to the last Wednesday but one, so that they might get reports of their proceedings earlier than they did at present. He therefore gave notice that a motion to that effect would be made at their next meeting.

The proceedings terminated with the usual vote of thanks to the Chairman.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Thursday Evening, the 18th ult., at eight o'clock, at St. Peter's School Rooms, Walworth,—the Rev. F. F. Statham, in the chair.

The minutes of the last meeting were read and confirmed.

Several photographs taken by the different dry processes were exhibited by Mr. S. Davis, one of the members of the Experimental Committee.

The Chairman announced the following presents to their portfolio:—A photograph by Mr. Howard; a photograph of *A Sleeping Child*, by Mr. Fitch; and a copy of a picture painted by Mr. Noel Paton, presented by Messrs. Smith and Blanchard.

Mr. Wall presented several *cartes de visite*, (intensified by bichloride of mercury,) and Mr. F. Howard exhibited a series of views.

Mr. Chadwick and Mr. C. M. Denison were duly elected members of the Society.

The Chairman called attention to the copies of their presentation print lying upon the table for members to select from. Any members not present on that occasion could have their copies upon applying to the Hon. Sec., Mr. Wall, either at his private residence, or at his studio, 28, Old Bond Street.

Mr. Hannaford read the Third Report of the Experimental Committee [see page 165], for which a vote of thanks was passed with applause.

Mr. Howard thought they ought not to pass over the report of the Experimental Committee without expressing their approbation of the researches they had made. He had tried Mr. Hannaford's process for preserving the plates as follows:—He precipitated silver in ammonia and albumen until the precipitate was no longer dissolved; and he then, by adding one drop of ammonia, made the solution clear. He then prepared a Fothergill in the usual way, partially washing it; a second he prepared, thoroughly washed, and coated it with the solution mentioned by Mr. Hannaford, and washed it again. A third plate he coated and partly washed, and then covered it with the preservative solution; and a fourth he coated with the solution and did not wash at all. He exposed these plates for five minutes each one dull Saturday, when he found the Fothergill plate under-exposed, but the detail pretty well brought out. The plate was well washed both before and after the application of Mr. Hannaford's preservative, and he might say the sensitising solution was fully exposed, and gave a vigorous and well-defined negative. The plate partly washed, strange to say, did not present so good a negative as the one thoroughly washed; although, knowing how sensitive the Fothergill plate was when only partially washed, he had expected a different result. He could only attribute the latter case to the superabundance of silver, which acted as a retarder rather than as an accelerator. The plate coated with the solution, and not washed after, although exposed the same time, was, though not exactly a good negative, very nearly so—knowing how insensitive a Fothergill plate was, if not washed after being albumenised. This he thought gave promise. He called attention to these facts, as showing that Mr. Hannaford had made a step in the right direction. The process was very simple, and there was no danger of stains. He thought they ought to assist the Committee by pursuing any course of experiments they called their attention to.

Mr. G. W. Simpson exhibited some turpentine waxed-paper negatives, taken by the Rev. J. Lawson Sisson with two minutes' exposure, and a half-inch stop. It was a modification of the old waxed-paper process, and gave very good definition and sharpness. [See *British Journal Almanack*, page 35.]

Mr. Borchert had tried a process similar to that recommended by Mr. Hannaford. On the one hand, he had poured over the sensitised and thoroughly-washed plate a 10-grain silver solution, and then the usual prepared ammoniated albumen solution; on the other hand, he had mixed a few drops of a silver solution containing half a grain of dry nitrate with two drachms of the prepared albumen, and employed this quantity in two effusions on the previously well-washed plate, and washed again. In both instances he had noticed an increase of sensitiveness by one-half. On one plate he allowed the albumen with nitrate of silver to dry (unwashed), but after five days' keeping decomposition manifested itself in developing. Supposing that other insoluble silver salts might turn out more stable, he tried chloride and cyanide of silver. He weighed out the materials in atomic proportions, allowing a quarter more on the side of nitrate of silver (to make sure of the sensitive modification, if such be): he dissolved them separately in water, stirred the chloride or cyanide solution into the silver solution (all this by yellow light), and washed well. Of the moist precipitate he mixed to four ounces of prepared albumen a little more, as it appeared to take it up, allowed it to deposit for two hours, and poured off the clear for use. The albumen solution containing cyanide of silver had, when put aside in a dark place for four days, assumed a dark brown colour. The other solution containing chloride of silver turned yellow only at the end of ten days. Dry plates prepared with those two albumens, when fresh and lastly well washed, did not, on being exposed along with ordinary Fothergill plates, show any increase of sensitiveness or intensity. He approved of Mr. Hannaford's suggestion to employ a prepared albumen with a few drops of silver solution in it, as conducive to the production of equal sensitiveness on every part of the plate.

Mr. Hannaford said if the plates covered with the solution he recommended would not keep, then the Fothergill plates would not keep either, as the same action took place in both processes. The silver was not added in excess, but only in a sufficient quantity to produce intensity and sensitiveness. The only real difference was that in the Fothergill process the silver was added to the albumen when on the plate, whereas, in his modification, the silver was dissolved in the albumen before the latter was poured on the plate, so that a large surface would be rendered more even in its action when prepared as he suggested than would be the case in the ordinary Fothergill plate. With regard to the amount of washing required, it was only necessary to take the plate from the bath and thoroughly wash it before the solution was applied, but not afterwards. That method was simplicity itself, and quite as simple as the tannin process, without the danger of the film leaving the plate. It does not follow, however, that the operator must confine himself to the nitrate of silver: the cyanide and citrate of silver would do as well. The plates he had tried with the solution appeared to him to give very promising results; and if by some such method they could rely upon evenly coating large plates—say twelve by ten or fifteen by twelve—it would be a great advan-

tage, as the ordinary Fothergill plates did not present that even appearance exhibited by the collodio-albumen or by any of the thoroughly-washed plates.

Mr. Borchert, whilst admitting that Mr. Hannaford's modification would render the plates more even in action, did not see how it could increase the sensibility.

Mr. Hannaford did not claim any increase of sensitiveness for his method, but thought it would give equal sensitiveness with the Fothergill process; still, Mr. Ackland had told him that if the nitrate of silver in the dry plate was in excess of the salts, it would be far more sensitive than if the salts were in excess of the silver. Thus, if one-half of a plate were washed with a chloride, and the other redipped in the nitrate of silver and then thoroughly washed, when such a plate was exposed, the part that had the most silver upon it would be twice as sensitive as the other half having an excess of chloride. However, he only claimed greater simplicity in manipulation, and more eveness in coating large pictures. He might refer to some Fothergill plates taken by Mr. Howard, who was a very careful manipulator, but yet they were far from even in the skies.

Mr. Howard was afraid Mr. Hannaford was not exactly aware of all the circumstances connected with the plates he alluded to. In the first place, in the Fothergill plates there was no doubt that the decomposition commenced at the edges and extended gradually according to the length of time between the preparation, exposure, and development. Now, the plates in question were prepared a week before he went into the country, where he remained three weeks, and the red tinge at the edges of the plates was sufficient to show that decomposition had begun. A freshly-prepared plate, he thought, would give as even action as the collodio-albumen plate, although he admitted that in a large amount of sky it was very difficult to get the requisite density up to the extreme edges.

Mr. S. Davis recommended the use of glucose mixed with the albumen, which would, in his opinion, enable them to work without free nitrate. He had used albumen and glucose in equal parts, which he found retained the film to the glass with great tenacity, and liquified the albumen to such a degree as to enable it to pass through the filtering paper. He tried that mixture on two nine-by-seven plates, from which all free nitrate was removed, exposed them eight minutes with a two and a-half inch lens and a half inch stop. The plates turned out to be over-exposed, and he subsequently found four minutes sufficient, so that the old idea respecting the necessity for free nitrate was proved to be wrong. With regard to Mr. Hannaford's solution he thought it would coat the plate evenly, but he did not consider that it would keep for any length of time without undergoing decomposition. He had before expressed the same opinion of all combinations of albumen and nitrate of silver.

Mr. Hannaford said his solution acted simply as a preservative, and might be used over and over again, which was not the case in the Fothergill process, where the solution would stain after being used once or twice. Mr. Davis got rid of the nitrate of silver, which one would at first fancy would get rid also of the intensity, but that was restored by the glucose. He asked how Mr. Davis applied his preservative?

Mr. S. Davis said his manipulation was similar to that of Mr. Hannaford. He thoroughly washed the plate, covered it with the solution, and thoroughly washed again. In answer to Mr. Hughes he said plates prepared by the glucose-albumen process would keep three, four, or even six weeks in the hottest weather. He put five minims of ammonia to each ounce, which had a tendency to preserve it so long as the alkalinity of the ammonia was kept up. The glucose was made from the starch of the potato.

Mr. Hughes had made a mixture of extract of raisins and ammonia, which kept very well until the alkalinity of the ammonia was overcome by the acid of the raisins, when a vegetable would begin to form on the surface, which he removed by filtration, and then added fresh ammonia. With regard to the tannin process the fault generally found with it was the weak hold the film had upon the glass; but he must say there was a most extraordinary difference of opinion upon this point. One gentleman told him he had experimented with fourteen different kinds of collodion by that process, and although he used the tannin solution so strong as twenty grains to the ounce, he never found one film which detached itself from the glass. Mr. Hardwich never found the film give way, and said that Major Russell's recommendation to use gelatine to prevent the film leaving the glass was perfectly unnecessary, as the film never did leave the glass. Mr. Sutton was of a similar opinion, and yet it was the opinion of the Committee that the film did leave the glass. He himself had heard from amateurs that they would get on very well with that process, if they could but get the film to stick to the glass.

Mr. Hannaford objected to the introduction of gelatine, as it took from the tannin process one of its chief advantages, viz., its simplicity. There was a beauty and crispness about the albumen plates scarcely equalled by the wet process, and, therefore, if complicity were introduced into the tannin process, he should greatly prefer the albumen process.

Mr. Simpson, referring to the application of albumen to the plate before coating with collodion, said a gentleman had told him that he found no deterioration of his bath by its use, as he had coagulated it by a solution of sulphate of iron before putting it into the bath.

Mr. Hughes said that might certainly be done, but they lost one of its chief merits, viz., its near approach to the simplicity of the wet process. By Mr. Hannaford's process a person could prepare a dry plate nearly as easily as a wet one, and the dry plate thus prepared developed nearly as quickly as a plain wet collodion negative would do. He thought that, instead of trying to find out some film that would make the film stick to the glass, they might do something with the collodion itself. The powdery form of collodion was generally thought to be the best; but now the advocates of the tannin process preferred the "skinny" kind of collodion. He thought that in some cases water was allowed to get under the film, and that the failures might be thus accounted for.

The Chairman thought that if the glass were warmed before the film was put on, all moisture would be driven off. Increasing the temperature of the glass might also prevent a thin coating of air being left under the film, and thus the chances of its adhering would be much increased.

A Member thought one cause of the film separating from the glass was the swelling out of the film by the tannin solution, and then in drying it became full of cracks and holes. That was owing to the expansive power of the collodion and tannin being different.

Mr. S. Davis said that might be the case, as tannin was largely used in medicine for its astringent and drying properties. He inquired if any gentleman had experimented with the resin process, which was simply the wet process with half a grain of resin added to each grain of collodion?

Mr. Clarke said he found the development by that process was very unequal, although it required but very short exposure. He had used shellac instead of resin, and he considered it better.

Mr. Hannaford had prepared a few plates with resin, but had found them liable to crack in drying. They developed out with all the rapidity of wet plates, but he had a few stains, which seemed, however, to arise rather from carelessness in the washing than from anything else. He thought the process highly promising, since for simplicity it could not be equalled.

Mr. Clarke said if stereoscopic plates were not thoroughly washed, and were placed to dry on their narrow end, there would be an accumulation of nitrate of silver which would cause one picture to be more intense than the other; but this might be obviated by resting them to dry on their longest side.

Mr. Hannaford said washing the plate with salt and water would remove that danger.

Mr. Clarke did not think so.

The Chairman thought members ought to furnish the Experimental Committee with subjects for their experiments. They should make out a list of what it would be desirable to experiment upon.

Mr. Wall said the members of the Committee would gratefully receive any suggestion from the members of the Society, as they were sure they would be of great value to them. He wished to inform them that it was proposed to have a *soirée* in June, the expenses of which—paid last year by the members of the Committee—were to be defrayed by the produce of tickets of admission at one shilling each. Members might take as many tickets as they desired for themselves and their friends. At the next meeting he would read a paper *On Sharpness*, and Mr. Sydney Smith would read another *On the Solar Camera*. The latter paper would be very valuable, as Mr. Smith had been making a great number of experiments on that subject. A meeting of the members of the Committee was appointed to take place at 28, Old Bond Street, on a subject of much importance, which would most likely have to be brought before a general meeting of the members.

Mr. Thomas Clarke then contributed the following to the Society's

PHOTOGRAPHIC JOTTINGS. No. VII.

On the Stereotrope.

Permit me to make a few remarks on the stereotrope exhibited at the *soirée* of the Photographic Society, at King's College, on the 4th inst., in which was shown some machinery in motion, and on looking at which I was immediately convinced of the impossibility of representing the steady, progressive movements of machinery; for in this instrument several pictures, taken at various stages of progression, are presented to the eye, one after the other, whilst, on the other hand, the image presented to the eye by the machinery itself is, I may say, *one* ever-changing picture, and not made up of distinct images, hence the jumping appearance which has already been remarked by Mr. Simpson, in the *Photographic News*. This, I think, can never be entirely overcome; it may be lessened to a considerable extent by multiplying the pictures, but not entirely overcome, from the above-mentioned cause. No doubt for some objects it will be very well adapted—objects in which distinct images are presented to the eye in succession: such as animals in motion, where one foot is placed before the other, and is actually at rest for a certain fraction of time; or the uplifting of a hammer, where even two pictures would be found sufficient for the illusion; and a multitude of objects of this description might be very well exhibited.

There is also another point to which I would call attention, and that is that only half the picture was visible; possibly, however, this may be overcome by enlarging the aperture, as suggested by Mr. Shadbolt at the *soirée*. I do not wish by these remarks to at all depreciate the value of the discovery, or rather the application of a known principle to stereography: on the contrary, I admit it to be very amusing and instructive, and may be a useful addition to our inventions; but I do think it unadapted for the representation of such objects as machinery in motion.

While upon this subject, I take the opportunity of giving an idea of my own with regard to stereoscopic views—viz., to obtain two panoramic pictures at the proper angle for viewing them in the stereoscope, and mounting them on rollers, so that they may be viewed in the stereoscope as a moving panorama. I conceive the effect would be charming, and might easily be accomplished by making a slide with four rollers, one at each end and two in the centre: these could be connected by a piece of silk, and made to turn by a handle at the end, similar to the frame used for the snow-storm in the magic lantern.

A vote of thanks was passed to Mr. Clarke for his paper, and the proceedings terminated with the usual vote of thanks to the Chairman.

BLACKHEATH PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on Monday evening, the 15th ultimo, at eight o'clock, at the Golf Club House, Blackheath,—Charles Heisch, Esq., the President, in the chair.

Mr. Wire, the Secretary, read the minutes of the last meeting, which were confirmed.

Messrs. Williams and Melhuish were appointed auditors to examine the accounts.

Mr. Skaife, before reading his paper *On Enlarging from Micro-Photographs* [see page 160], wished to make a few observations upon the name he had given to his camera, viz. "pistolgraph"—as some remarks, disapproving of the name, had appeared in the journals. About the end of the last year he read a paper before the North London Photographic Society, in which he explained the reason for adopting this term, and no person had then thought fit to attempt to convince him he was wrong. Lately, however, some remarks had appeared in a popular journal, which had been copied into the photographic journals; and as he felt he had been misunderstood, he proposed to again explain why he considered the term "pistolgraph" correct. In the first place, the instrument was originally held like a pistol, and was worked by a trigger in a similar way. When used, a person unacquainted with the instrument would believe a pistol had been snapped at him; and, therefore, he considered the term "pistolgraph" gave a good idea of the little camera he used in taking the small instantaneous pictures he had the pleasure of laying before them. Mr. Skaife then proceeded to read his paper, the principle of which he illustrated by throwing the magnified shadow of a minute negative upon a sheet of drawing-paper, and washing over the light parts with Indian ink. He also exhibited several finished pictures which had been sketched in by that means.

The Chairman said Mr. Skaife's method was one among many applications of what he considered an important principle, viz., the enlargement of small photographs. It was well known that a small photograph could be obtained more perfect than the larger ones, and the small one could be greatly enlarged without losing any of the detail or general effect. By adopting a kind of double enlargement, objects might be magnified sufficiently for school lectures, without there being any necessity for using the oxyhydrogen microscope. For instance, he had obtained an image of a louse, magnified to the length of a foot or more, with every hair on its body perfect. He first obtained a negative, about one inch long, by means of the microscope, and had then printed a copy of it by super-position on a dry plate, which he had again magnified and thrown upon a sheet of paper, as Mr Skaife had done that evening. He thought the best lamp to use for that purpose was one of the small camphine or paraffin lamps. The whole subject of enlargement was one that had yet to be worked out, and would well repay investigation.

Mr. Melhuish inquired whether a small photograph could be enlarged equally sharp with a good collodion negative.

The Chairman believed a good small photograph might be enlarged to a great extent—that was to say, from a stereoscopic size to twelve by ten inches, without the least difficulty, and without the slightest loss of detail.

Mr. Melhuish had found enlarging unsatisfactory: whether owing to the imperfectness of his lens or through his own clumsiness he could not say, but he had never succeeded in obtaining a thoroughly sharp negative photograph. He had never seen a good enlarged photograph: they always wanted sharpness.

The Chairman said as objects could be enlarged in the microscope with great perfection, there was no fault in the power of lenses to magnify to almost any size; and, therefore, all they had to do was to obtain a correct photograph in the first instance. One source of failures he believed to be that people tried to overdo the enlargement: by keeping within reasonable limits a great deal might be done. Another essential point was to employ as short a focussed lens as possible for enlarging. A small single stereoscopic lens, with a short focus, would do excellently. A great deal depended upon the light, but he thought most of the failures arose from the rays being diffused by a lens with too long a focus being used. Some of the best he had seen had been enlarged from daguerreotypes. He had been making experiments lately on the subject, and he believed the best results would be obtained by letting the light from the sky shine directly down through the negative.

Mr. Skaife said that would answer very well for dry plates; but he had found the combination answer better than the single lens. His method of working was to have the lens fitted up in a little box fixed under the skylight, so that the image was thrown upon a table beneath.

Mr. Melhuish inquired what length of exposure was required; for he found, in using a diaphragm sufficiently small to ensure sharpness, the exposure necessary was so long as to render the process almost impracticable.

The Chairman said that the longest exposure he had given was ten minutes, and that was not with light direct from the sky. The proper exposure of a transparent positive to obtain an enlarged negative was about three minutes. For enlarging only to a small extent, the small orthographic lens answered admirably, and worked in about a minute or so.

A vote of thanks to Mr. Skaife was then carried.

On the motion of the Chairman a special vote of thanks was tendered to Mr. Wheeler, the late Secretary, for his services during his period of office.

Mr. Wire, the Secretary, then read the Report of the Council for the year.

FOURTH ANNUAL REPORT OF THE COUNCIL.

In presenting this their Fourth Annual Report, the Council feel that they have cause both for congratulation and regret. They can congratulate the Society on its financial prosperity, as is shown by the balance sheet appended, while the subjoined list of communications made to the Society during the past year amply proves that the interest of the meetings has been well sustained:—

Mr. Hardwich *On the Present State of our Knowledge of Photographic Collodion*—Mr. Wheeler *On the Solar Spectrum in its Relation to Photography*—Mr. Glaisher *On Pretsch's New Process—Some Remarks on Fluorescence*, by Mr. Wheeler—*Remarks on Toning*, by Mr. Heisch—Mr. Heath *On the Production of Direct Transparent Positives from Objects in Relief—Further Remarks on Toning*, by Mr. Heisch—Mr. Heath *On Manipulation in the Field*—Remarks *On Transparent Printing on Albumen*, by Mr. Negretti—Mr. Skaife *On a Simple Means of Producing Enlarged Copies of Pistolgrams or other Small Photographs.*

Various interesting photographs have from time to time been exhibited, and special mention may be made of the transparent views of Windsor Castle and the other palaces, exhibited by Mr. Heath, and those from Java, Japan, &c., exhibited by Mr. Negretti.

Two prints—the one by Mr. Heath, the other by Mr. Heisch—are also ready for presentation to the members for 1860.

During the past year but little that is strictly new has been accomplished in photography; but, on the whole, the character of the pictures produced is more artistic than formerly. The experiments of Bunsen and Kirchoff, on spectrum analysis, though not made with relation to photography, may ultimately have an important bearing on the subject, especially with regard to the kind of artificial light best adapted for photographic purposes, by pointing to those substances whose flames appear in the more refrangible part of the spectrum.

While speaking thus cheerfully of the past, the Council regret that they cannot look forward with equal satisfaction to the future prospects of the Society. Circumstances have deprived the Society of the assistance of some of its most active members—several having left the neighbourhood—and others being prevented by the pressure of professional engagements from taking any active part in its proceedings.

The number of working members being thus so greatly reduced, the Council feel that they cannot carry on the affairs of the Society in such a manner as to maintain the position it has so well won, even by taxing to the utmost the few who remain. Under these circumstances they think it desirable to recommend the suspension of the periodical meetings, at least for the present. They would hardly advise the entire breaking up of the Society, as occasional meetings may be held when there is any subject of special interest to bring forward; and, should any number of active photographers hereafter come into the neighbourhood, the periodical meetings could at any time be resumed without the formation of a new Society.

In the mean time the Council would recommend that no subscriptions be for the present collected, excepting the arrears for 1860, and that the affairs of the Society be entrusted to a committee, who should be empowered to continue the subscriptions to the various journals out of the balance in hand, and to call special meetings when considered desirable.

The Treasurer, in his balance sheet, showed a balance in hand of £32 5s. 10d.

The Chairman assured the members that the Report which had just been read had not been prepared without due consideration. Although they had managed to get papers of interest at all but one of their meetings, yet it had been done by over-taxing one or two of the members of the Society. And even when papers of considerable interest were read, the attendance of members generally was so small as to be discouraging. He thought that the recommendation of the Council that the monthly meeting should be discontinued ought to be adopted, although they might meet once in three or six months to discuss any paper of interest that might be forthcoming. He was afraid that if the Society continued to meet every month, it would lose that credit it had so justly earned. That was their view of the subject, but the Society must adopt the course it deemed best.

Mr. Brown thought it was a great pity that they should discontinue their meetings, which had afforded the members so many pleasant evenings. It was the means of bringing together all the gentlemen interested in photography in the neighbourhood, and if the meetings were given up the attraction to photographers to settle in the neighbourhood would cease.

The Chairman said a Committee was to be appointed who would call the members together when any paper of interest could be procured.

The Report of the Council was then received and adopted.

Mr. Heisch, Mr. Glaisher, Mr. Wire, and Mr. Wood, were then appointed to act as a Committee to collect the arrears due to the Society, and to discharge its debts.

The thanks of the meeting were then given to Mr. Wire for his services as Secretary.

The proceedings terminated with the usual vote of thanks to the Chairman.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A Special General Meeting of the members of this Society was held on the 16th ult.,—Mr. C. L. Haines, Vice-President, occupying the chair.

The minutes of the preceding meeting having been confirmed, a ballot for the new members proposed on the 26th March, namely, Mr. Joseph

Wingrave, and Mr. Joseph Mountfort, of Coventry, was taken, and they were declared to be duly elected.

The Report of the Sub-Committee, appointed to confer with the Committee of the Aston Hall and Park Company, as to the Exhibition of Photographs proposed to be held at Aston Hall, in connexion with the Company, was next read, and ordered to be entered on the minutes.

A long discussion ensued upon the subject, after which it was unanimously resolved that it would be advantageous to accept the offer made by the Aston Hall Company to prepare a Photographic Exhibition in connexion with that of the Company.

The gentlemen present were afterwards constituted a Committee (with power to add to their number), to carry out this object.

The meeting was then adjourned until the 30th of April, on which day the discussion on Dr. Anthony's remarks *On Photographic Lenses* took place, of which we shall give a report in our next issue.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on Thursday, the 25th March,—Mr. Wilson in the chair.

After the minutes had been read and approved of, Mr. D. Brown read a paper *On the Collodion Process*, detailing the difficulties he had met with in the earlier days of the art. [See page 166.]

When Mr. Brown had concluded his paper, a discussion ensued respecting the result of a longer or shorter immersion in the nitrate bath; also as to the time of immersion being modified by the character of the collodion.

Mr. McFarlane stated that, by regulating the time in the bath, a great variety of effects could be obtained, a short immersion giving very strong effects of light and shade, and a longer producing a softer picture.

This was contrary to the opinion of Mr. Ewing, who stated that a prolonged stay in the bath produced "soot and whitewash."

Mr. McTear made some remarks upon the employment of collodion which had been kept a considerable time before iodising, and strongly advocated its use, on account of its tendency to produce cleaner pictures than newly-made collodion.

The meeting was then adjourned.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held in the Tower, New Bridge Street, on Friday evening, the 5th ult.,—Mr. G. C. Warren in the chair.

As the report was not forwarded in time to reach us until the moment of going to press, we were unable to include it in our last issue; and, as nothing of importance occurred, it is needless to give more than a condensed account of what took place.

The Chairman announced that Mr. Moule's photogen, which was to have been exhibited at the meeting, had not arrived in time, but would be forthcoming for the next meeting.

Mr. Roger Fenton and Mr. Lake Price were elected members of the Society.

Mr. McKie drew attention to the tannin process, with which were engaged many of our ablest photographers. He gave it as described by some of its warmest advocates. Though unsuccessful in many of his own experiments, he attributed the cause of failure to the unsuitableness of the collodion he had used. He had been supplied with some by his friend Mr. Laws. With it he had had better results.

Mr. Laws exhibited two negatives he had taken by the tannin process. They were the only two he had prepared. With both he had been successful. The edges of the plates were varnished.

The negatives were handed round and considered very satisfactory.

Mr. Laws remarked that, although he had been so far successful, he, as a professional, was still inclined to the wet process for certainty of result.

Mr. North also advocated the wet process in preference to any dry method.

Mr. McKie thought that, although the wet process might be considered preferable by professionals, he, as an amateur, considered that any good dry process would be a boon to such as himself.

The Chairman coincided in this remark.

Mr. Laws exhibited a tent of his own manufacture. The whole of the tent was enclosed in a box about two and a half feet by one foot six inches, and four inches deep. The bottom of the box formed a water-tight tray, which was fixed to a tripod stand; upright bars of deal were raised at each corner, which supported the lid of the box forming the top of the tent. Over the whole was thrown the tent cloth, which contained pockets for bottles. Light was admitted by yellow cloth. The waste water was carried off by a tube screwed to the bottom of the tray. In working in this tent the operator stood upright. The advantages of this tent were its simplicity, lightness, and portability. It was well examined and much admired by the members.

Mr. Hill, of North Shields, introduced to the notice of the members a stereoscopic camera, combining several improvements which he had introduced. The camera displayed considerable mechanical ingenuity.

Many very fine stereoscopic pictures, by several well-known artists, were exhibited by Mr. Bunn.

The Chairman announced that Mr. Laws had kindly consented to read a paper, at the next meeting, *On the Printing of Transparencies*.

A vote of thanks was unanimously given to Mr. McKie for his paper, and to Messrs. Laws, Hill, and Bunn, for the exhibitions of the tent, camera, and pictures; also to the Chairman.

The meeting was then adjourned to Friday, the 3rd instant.

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Continued.)*

Backgrounds.

A set of tints having been already given for plain backgrounds the following are added for those consisting of sky, or sky and landscape, &c.

Greys for Skies.	Black-Lead, White, Naples Yellow, & Madder Pink, Brown Ochre and White. Burnt Sienna, Black, and White. Indian Red, Cobalt, and White. White, Black, and Vermilion. Ultramarine, White, and Venetian Red.
Lighter Tints for Skies.	Mars. Orange and White. White, Vermilion, and Yellow Ochre. French Blue, White, and Vermilion. Ditto with a little Naples Yellow. Black Lead and White. Ditto with Madder Lake. French Blue, Raw Umber, and White.
For Distances.	French Blue, Indian Red, and White. White, Terre Verte, and Light Red. White, Black Lead, and Naples Yellow. Indigo, Indian Red, and Burnt Sienna.
For Foliage, &c.	Raw Umber and Black Lead. Blue Black and Naples Yellow. Terre Verte and Light Red. Ditto and Brown Madder. Ditto and Burnt Sienna. Naples Yellow, and Raw and Burnt Sienna. Terre Verte, Black and Naples Yellow. Yellow Ochre and Blue Black. Terre Verte and Naples Yellow, &c.
For Glazing the above.	Yellow Lake. Madder Brown. Raw Sienna. Gamboge, &c.
For Stems of Trees, &c.	Black Lead and Naples Yellow. Black and Burnt Sienna.
For Twigs, and Deepest Shadows.	Madder Brown. Vandyke Brown.
For Stone-Work.	Black, White, and Yellow Ochre, or Burnt Umber. Black Lead and White. Black, White, and Burnt Sienna. Brown Ochre, Black Lead and White. Black Lead and Naples Yellow.

In working a sky do not produce the blues too *vivid;* but keep all subdued and indefinite, blending the clouds with soft light touches of the greys and flesh tints, and striving to secure as much as possible the effect of air and space rather than that of blue paint or a mere screen of some blue material.

On Drapery.

All the rules I have given in other portions of these articles are of course generally applicable to every description of colouring.

Using the tints I shall presently give, proceed with a full pencil and transparent colour to strengthen the darkest shades; then take the same tint, made lighter with white, for the half-shades, adding more white as they grow lighter. Next lay in the local colour, and lastly the high-light, with a full pencil and rather stiff colour. After this soften and blend the tints with the light feathery touches of a clean soft brush, as before described; and lay in, sharp and clear, with decided touches, of the proper shape and strength indicated by "the guide," the high lights and reflections. This done, the more distinct markings of the deeper shades may be touched in with spirit and force.

The degrees of force in the lights and reflections being dependent upon the nature of the material, the guide must be carefully consulted before such are rendered.

TINTS FOR WHITE SATIN.

High Lights.—Flake White, with a touch of Cobalt.
Middle Tint.—White, Naples Yellow, Black Lead, and Madder Pink.* Lighter or darker as circumstances may demand.
Shade Tint.—White, Black, and a little Indian Red.
Reflected Lights.—If not decided by the colour of the subject reflecting the light, these may be got with White, Light Red, and a little Black Lead.

FOR BLUE SATIN.

High Lights.—White and Prussian Blue (pale).
Middle Tint.—Ditto used darker, with a touch of Madder Lake.
Shadows.—Black Lead, Prussian Blue, and a little Madder Pink.
Deepest Shadows.—Indigo, Lake, and Raw Sienna.
Reflected Lights.—White, Prussian Blue, Naples Yellow, and Madder Pink.

GREEN SATIN.

High Lights.—White and Verdigris.
Middle Tints.—Prussian Blue and Naples Yellow.
Shadows.—Prussian Blue and Brown Pink.
Deeper Markings.—Prussian Blue and Raw Umber.
Reflected Lights.—Burnt Sienna and Prussian Blue.

PINK SATIN.

High Lights.—White, Madder Pink, and Light Red—using most White.
Middle Tints.—Lake and White.
Shadows.—Indian Red, Vermilion, and White.
Reflected Lights.—Light Red, Madder Pink, and White.

YELLOW SATIN.

High Lights.—King's Yellow and White.
Middle Tints.—White and Yellow Ochre and White with Yellow Ochre, a little Black Lead, and Pink Madder.
Shadows.—Burnt Sienna, Raw Umber, and a little Black Lead.
Reflected Lights.—Ochre, Light Red, and White.

BLACK SATIN.

High Lights.—White, Black, and a touch of Light Red.
Middle Tints.—Ditto, with more Black.
Shadows.—Black and White, with a touch of Lake.
Deeper Shadows.—Indigo, Vandyke Brown, and Lake.
Reflected Lights.—Ditto, with a little Brown Ochre.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. WALL, Esq., 11, THE TERRACE, WALWORTH.

JAMES S. (Bromsgrove).—Will receive a private reply in the course of a few weeks.
MISS D. (Kingsland).—The specimens have but just arrived, and I have not yet had time to look at them.
AN OLD PUPIL.—The classes have commenced. I have no right to reply to your latter question here, the matter being apart from the subject of these papers. Have not the time to spare, or would oblige you willingly.
ANOTHER LADY AMATEUR.—A reply will be given in the next number.

Foreign Correspondence.

Paris, April 26, 1861.

MAJOR GORDON was listened to with great interest by the members of the French Photographic Society present at the meeting of Friday, the 19th instant. He first submitted to their notice a curious collection of steroscopic views on glass, taken in India. Many persons, and myself among the number, were, to their regret, obliged to depart without having seen this collection, so unwilling were the happy individuals who had possession of the stereoscopes to let the pictures leave their hands. The Major then exhibited a very ingenious tent, which he had made use of in his various excursions, but which I cannot describe very accurately without a drawing. All I can say is that it is composed of a large piece of waterproof cloth, which is placed upon uprights made of bamboo, and extremely light. Under this tent the artist is in his operating room; he has a table, a board for draining off the glasses, a dish, and a water reservoir. The last two articles are in waterproof stuff and flexible, so that they occupy but very little space.

Stereoscopic pictures of another kind called forth the admiration of the meeting. They were instantaneous views taken by MM. Ferrier (father and son) and Soulier. The prodigious rapidity of the operation had in no degree detracted from the clearness of the image obtained. The details were as delicate in the deep shades and the demi-tints as in the lights. There was not a single harsh contrast—not one doubtful line. With the aid of a microscope, one could recognise the faces of a thousand of the beings passing to and fro in the vast place (the Boulevard de Sebastopol) included in these views. The *obturator* employed is a sliding one, which reduces the exposure to an inappreciable fraction of a second.

In speaking of these artists, I have to transmit a reclamation which they have requested me to address to you in their name. THE BRITISH JOURNAL OF PHOTOGRAPHY published in its last number an article having for its title *The Albumen Process of M. Ferrier as practised by Mr. Negretti* Now, this process (perhaps an excellent one) is not M. Ferrier's process at all. He formally disavows it. He has never communicated his method to Mr. Negretti, and consequently cannot have authorised him to publish it.

It might be added that M. Ferrier's method is free from the inconveniences indicated by the author of the communication in question, and the proof is that our friend has employed it when travelling in hot countries and when travelling in cold. To publish with apparent authority the process of a master in the art, whose reputation may be useful to you, is already a serious affair; but to put into public print, under his name, a process which does not belong to him, in order to appear to hold it from him, is still more serious, and Mr. Negretti would do well to think over the matter.

A photographer of Lucca has obtained positive pictures with writing and with printing ink; but he does not say by what method. The specimens sent have the appearance of pictures printed with salts of silver.

M. Selmer, of Berghem, in Norway, transmitted to the Society a series of pictures, whose negatives are obtained on wet collodion, with the iodide and the bromide of ammonium. To obtain greater rapidity, he mixes acetic acid and absolute alcohol in equal parts. After a few weeks this mixture produces acetic ether, which is added to a seven per cent. silver bath, at the rate of twelve or fifteen drops per litre (about thirty-five ounces). The pictures are fixed with chloride of calcium and neutral chloride of gold (Gray's method).

An amateur, M. Lavoyne, has been making some experiments, and communicates the results. He has employed with success a collodion coated with a keeping solution, composed of one part honey to four parts water, which is poured upon the glass upon its leaving the silver bath. Development with acetate of iron gives great rapidity.

M. Lavoyne has tried Major Russell's tannin process, and has found it very advantageous. The time necessary for developing an image executed by this method does not exceed five minutes.

Various experiments which he has made with toning processes for positive papers have led him to prefer the following formula:—

Chloride of gold and potassium	1 gramme.
Chloride of sodium	10 grammes.
Water	4 litres.

M. Poitevin read the description of the different improvements introduced by him into the charcoal printing processes; but, unfortunately, I did not seize his words sufficiently well to report to you that description with accuracy.

Apropos of charcoal printing, I must speak of an application of photography which has lately been acquiring a certain importance. I refer to photographic enamels. The author, M. Lafont de Camarsai, published a method in 1855, by the aid of which he obtained pictures of various colours upon paper, porcelain, glass, ivory, &c. He has since improved his modes of operating; and within the last few days I have seen many of these pictures, which possess remarkable beauty. They are mostly medallion portraits upon porcelain. There are some large-sized ones which do not yield in modelage and vigour to the best pictures on paper by our best portraitists. M. Lafont, who is a miniaturist, paints these portraits with talent, and produces works which are thoroughly artistic. The public are acquiring a taste for them, and I should not be surprised if some day this application were to obtain a vogue equal to that of the visiting cards.

Two new instruments were lately presented to the Society. The first was a camera, in which all the operations of the wet collodion process are effected by themselves; so that you place in the frame a collodionised glass, and you draw out a picture which has merely to be fixed. It suffices to press upon this knob or that, according to the manipulation to be performed. The result is very simple; but the mechanism is so complicated, that it would be useless for

* Or white and raw umber, with a touch of ivory black.

me to attempt to describe it. I should suppose even that the photographer would be liable to frequent mistakes in the manœuvring of its various knobs, which would naturally produce a change in the order of the operations. This *chambre-laboratoire* is, however, arranged in a very ingenious manner, and does credit to its inventor, M. Anthony.

The other instrument, a description of which was sent by the author, M. Henri Romberg, of Liège, is intended to facilitate the preparation of positive sheets. It is composed of a vertical frame, supporting two parallel rollers, which may be separated or brought together. The bottom roller dips half-way throughout its length into a narrow vessel containing the baths. The sheet of paper is rolled round the two cylinders, the upper border being joined to the lower one, and the cylinders separated so as to stretch the paper properly. By turning the little crank fitted to the bottom roller, the paper is moved round, and its whole surface is successively introduced into the bath. This system is especially advantageous for large sheets, which may thus be prepared with ease and economy, seeing that a very small quantity of liquid suffices, provided it is always kept at the same level.

Our Exhibition will be opened on the 1st of May, and I believe that I may, without risk, assure you beforehand that it will be the most interesting we have yet had in France. ERNEST LACAN.

New Books.

Microscopic Photography: its Art and Mystery. The Principles of the Art Disclosed, and its Practice Clearly Explained. By James Nicholls.*

(London: F. J. Cox, Skinner Street, Snow Hill.)

At a trial for felony, about sixteen or eighteen months ago, the counsel for the prisoners attempted to quash the indictment on the ground that the criminal information upon which it was framed was disclosed by the prisoners while under examination in the Bankruptcy Court, a clause in one of the acts relating to that court specially exempting them from the usual consequences of the disclosure of a criminal act. The Lord Chief Baron, Sir F. Pollock, before whom the case was heard, however, disallowed the objection, pointing out that in law, as also in common sense, the word *disclosure* signified the communication of information *previously unknown*, whereas in the case before him the criminal act was known before the examination.

We are at a loss to understand how it is possible now to *disclose* the principles of an art which were published by the writer of this article in a paper read before the London Photographic Society on the 5th of Nov., 1857, and at the same time demonstrated by actual experiment before the meeting. Upon that occasion, also, a paper on the same subject was read by our friend, Mr. George Jackson, and both papers will be found in this Journal of the 15th November, 1857, and in the Society's organ on the 21st of the same month. It is not therefore surprising that we cannot concur in the following unfounded assertion, which we extract from the preliminary observations of the author of the pamphlet before us, viz:—

"The few who have succeeded in the practice of an art which comes so much nearer to the initiative of nature's handiwork than anything hitherto known *have not been very communicative of the principles which govern it;* and it may be reasonably supposed that, unless such a *monopoly* be broken through, this vast museum of curiosity and interest will remain only half explored."

We learn from the title-page that Mr. Nicholls is a practical photographer, and a perusal of his pamphlet convinces the reader that such is the fact; but at the same time it clearly reveals that his claims to scientific knowledge are but slender. We believe that he very faithfully communicates all the information upon the subject of which he is possessed; but there are several points in which he is greviously in error, and singularly they are precisely those upon which he is most dogmatic.

The first caution which we desire to offer is with regard to the LENS, upon which subject we strongly recommend all who desire to embark in micro-photography to turn a deaf ear to the author of the pamphlet. Even the best of what he recommends is nothing but a makeshift. In order to obtain *first-rate* results, a microscopic objective by one of the first-class makers is a *sine quâ non;* and moreover it should be constructed upon the principle enunciated by Mr. Lister in his paper read before the Royal Society, in the year 1829; by which a considerable variation in the positions of the conjugate foci can be admitted without disturbing the corrections. Although not usually constructed with the chemical and visual foci coincident, there is no difficulty in making them so; but they are not then fitted for microscopic observation. A very ingenious addition to an ordinary microscopic objective was contrived by Mr. F. H. Wenham, many years back, in order to render the latter applicable for photographic purposes without interfering with its optical qualities. It consisted in the application of a shallow convex lens (removable at pleasure) in the position of the posterior diaphragm, thus slightly increasing the *power* of the combination, but at the same time reducing the over-correction for colour always required for the perfect performance of a microscopic objective in combination with the Huygendan eye-piece.

We have next to object to some of the remarks upon illumination of the negative (an operation which we regard as the keystone to success). We again quote:—

"The small camera at one end of the tube being in focus for the negative picture parallel with it at the other end, it might be supposed that nothing more was requisite than to slightly elevate the instrument to the sky and copy by the light transmitted through the negative, which would thus impression [become impressed ?] very rapidly; but note the defect—the far distant sky which produces the impression is *not* in focus, though the negative picture at a short fixed distance is so. The operator would naturally adjust and readjust the instrument to obtain a better focus, and would succeed to a certain extent by a focal compromise between the two distances. A picture, of course, would be obtained, and look passably well under low power; but, under a higher power, it would at once be seen to possess no true definition. The negative in this case is not, except in a partial degree, the 'radiant,' a term that was used (advisedly) before."

The far distant sky is not in focus, nor ought it to be so; and no operator who knew the principles upon which he should work would think of trying to make it so. Moreover, Mr. Jackson, who has produced as many and more perfectly defined specimens than most other operators in that direction, invariably works in the manner here asserted to be faulty.

Artificial light, too, has its advantages, notwithstanding Mr. Nicholls' sneer at it; for, besides being able to work at miscrocopic photography in bad weather or at night by its aid, there is a quality of some importance that it possesses in which daylight is deficient—that is, uniformity of action, a quality that will be appreciated by those who desire to produce a considerable number of specimens. The instructions for illuminating by artificial light, as given at page 14 of the pamphlet, are sheer nonsense, as well as the observations in connexion with them. Those for illumination by sunshine are sound enough, and are as follow:—

"The solar rays may fall upon the picture in any oblique direction, at any angle passing through it, and bearing away with them a bright but vague cast shadow of the image in any direction, downward or sidelong, such rays not being required or desired to reach the copying lens. Here the negative becomes a true 'radiant,' and is copied only through the medium of those rays which are diffused by itself, and which suffice to impress pretty rapidly."

As regards the negative, while we do not concur in many of the remarks, we do so as regards the dimensions recommended, viz., about two inches square, and that it should be as sharp as possible. Let an operator, however, beware of *intense* ones, excepting for copies of engraving, printing, &c.—that is, of simply *lined* objects.

There is one plan proposed for working from large negatives by which a double diminution is effected at one operation, upon the telescopic principle. This appears ingenious; but we have some little doubt about its practicability, principally on account of the loss of light involved by the rays passing through so many surfaces: in this, however, we may be mistaken, not having any experience to guide us. Our author says:—

"The copies are necessarily developed with a solution of iron, both for their colour, which should be black, and their brilliancy, which should be unclouded."

We do not hesitate to affirm, from very extensive practical experience, that for micro-photographs an iron solution is absolutely about the *worst* developer that can be employed, whether as regards delicacy, colour, or brilliancy of result.

Pyrogallic and citric acids, with a drop or two of acetic acid added, are the best—the latter being for the purpose of giving a slight warmth of tone to the colour, which without it is apt to be a trifle too bluish. A picture developed with iron will not bear anything like the same amount of amplification as one brought out by an organic developer, on account of the much greater coarseness of the deposit which the microscope readily reveals.

Lastly, with regard to "mounting," we would recommend him to let the drop of balsam fall on the slip of glass previously warmed, and not on the thin glass disc as he directs. We can boast of something like a quarter of a century's extensive experience in this operation, and we fancy that it is one which will "bother" a novice not a little.

In conclusion, although we have pointed out several matters which we regard as wanting correction, we do not think the pamphlet undeserving of attention. There are many useful hints contained in it; and it is written in a spirit of good faith and sincerity that we always appreciate, even when we are constrained to disagree with the sentiments expressed. We perceive, from a remark in a contemporary publication, that some confusion exists relative to the meaning of the word "micro-photograph," which indicates a minute photograph. The photographic delineation of a microscopic object is entitled "photo-micrography"—a very different affair, and one infinitely more important than that we have been considering.

* This Notice has been in type for some time back; but, owing to pressure on our space, we have not been able to find room for the article hitherto.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE RESIN PROCESS.

To the EDITOR.

SIR,—I perceive the resin process is beginning to claim a few friends. As I have a good deal of faith in it, I am pleased to find it gaining ground. Mr. Glover's paper, read at a meeting of the North London Photographic Association, March 27th, gives it a good lift. Several Leicester amateurs are gaining great successes with it, and find it the simplest, quickest, cleanest, and most certain process they have ever practised. One gentleman is making 12 by 10 plates with perfect success; and I will undertake to produce ten good negatives from a dozen plates.

There are a few conditions I find necessary to succeed perfectly, in addition to those Mr. Glover mentioned. Always wash in a common pie-dish, or dish of a similar shape, so that the plate is suspended by the four corners, at a distance of half an inch from the bottom of the dish. By this means you wash both sides of the plate completely, thus preventing stains when the developer runs along the back of the plate again into the developing glass, and is then poured again on the film. Develop with pyrogallic acid one and a-half grain, citric acid three-quarters of a grain, water one ounce: always use a pneumatic holder.

Citric is very superior to acetic for this process, yielding very fine brown negatives, extremely soft and full of detail; and Mr. Glover's method of increasing the intensity I find quite successful, though I do not like them so very intense. With a Ross's stereo. 4½-inch lens, one minute and a-half in sunshine is quite enough. The shortest time I have ever got a good resin negative with the same lens is forty seconds, and not an usually quick subject to photograph either. A person may prepare a dozen plates by this process, while another can only prepare four or five by Fothergill's or collodio-albumen; and I have an unusually intense negative from a plate which had been kept a month, and without a stain upon it. With regard to the tenderness of the film, varnishing the edge (as Mr. Glover says) is all that is necessary. I have used chloroform varnish for the purpose, with perfect success. I see Mr. Corey, in your last number, finds his old plate the more sensitive of the two. I have never found a plate spoil by being kept; but, never having kept one so long as he has, I am glad to see his communication. If our plates, by this process, succeed with merely washing the film, why need we apply albumen, gelatine, oxymel, tannin, raspberry syrup, or anything else, and be liable to failures, which are most frequently incidental to the application of the preservative medium only?—I am, yours, &c.,

April 11th, 1861. F. PARSONS.

[The preceding reached us too late for insertion in our last number.—ED.]

ACCELERATION.

To the EDITOR.

SIR,—Will you have the goodness to inform me, in your next impression, if another lens could be added, or any other contrivance adopted, to one of Ross's large lenses (the late Mr. Ross's £36 one), in order to shorten the focus, or to alter the lens in such a manner as to take the pictures in less time. The lens should (if the alteration were practicable) be able to be used with or without the addition, as, of course, I am aware that the size of the picture would be much lessened with a shorter focus.—I am, yours, &c.,

Newton, April 11, 1861. J. MACKLINGTON.

[It would be quite practicable to adapt another back combination, of shorter focus, to your present front one, so as to make it work more rapidly; but whether the saving of expense would be worth going out of the way to effect is questionable. You would be obliged to unscrew your present back combination and substitute the other—not unite the three.—ED.]

RESINISED COLLODION.

To the EDITOR.

SIR,—I observe in the last Journal you offer a sample of my resin collodion to any one who chooses to try it. If you have any applications for it I wish you would be kind enough to let me know, and I will forward you half a small sample bottle gratis, for any of your friends to try, and not to let them have the sample you had twelve months ago, as that would not be a fair trial. What I have in use now I know to be good, as yesterday I exposed six stereo. plates, and will challenge any other process to beat them at six *successive* exposures. They were all washed under a tap, and dried—no painting at edges, no gelatine, albumen, or tannin; held under the tap again before developing—no re-dipping, but requiring three grains of pyrogallic acid, half a drachm of Beaufoy's acid, one-third of a grain of citric acid, and half a drachm of alcohol, water one ounce, with a few drops of fresh solution of nitrate of silver, thirty grains to the ounce; *forty-grain bath, very slightly acid;* six stereo. negatives, average exposure one-half to three-quarters of a minute, sun five p.m. Please not to send that old stuff out: I will send you some up.—I am, yours, &c., CHARLES JONES.

Birkenhead, April 18, 1861.

PHOTOGRAPHIC GLOVES.

To the EDITOR.

SIR,—Can you recommend me, or tell me where I can procure photographic gloves, such as really meet the wants of the photographer? Trifle as it may sound, I believe there are few greater impediments to amateur photography than *dirty hands*. Nothing can be more inconvenient or more comfortless than the India-rubber gloves, or *gauntlets*, as for some unknown reason they are often called. They are difficult to put on, difficult to take off, and peculiarly disagreeable when on. What is wanted?—a pair of gloves, easy to put on and take off, perfectly impervious to moisture of any kind, and sufficiently thin to admit of feeling what is in the hand. If any one could and would supply an article of this kind, he would be a great friend to the photographer, and I am inclined to think the photographer would be a great friend to him.—I am, yours, &c., ALBIMANUS.

[We personally use vulcanised India-rubber finger-stalls (purchasable at most of the Mackintosh warehouses for about threepence each) on the thumb and two next fingers of the left hand, which we generally find sufficient protection; but we do occasionally spill some of the developing solution off the plate on to the back of the hand: probably an old pair of kid gloves put on before the finger-stalls would remedy that defect, especially if a coating of plain collodion were first poured over them. Perhaps something in *oiled silk* may be procurable.—ED.]

QUERY.

To the EDITOR.

SIR,—In your valuable Journal of the 15th, page 124, Mr. Heath mentions that his negatives were exposed about thirty seconds. Would he have the kindness to mention the size of the stop he used?—I am, yours, &c., J. H. SLATER.

MOUNTING STEREOGRAPHS.

To the EDITOR.

SIR,—Like your correspondent, "Sigma," I should be glad to have some information on the subject of mounting stereographs. Your answer to "Sigma" is inconsistent with my (doubtless) erroneous notion that stereographs taken on Latimer Clark's system are mounted without any change, and without any help of scissors whatever; but, with stereographs taken by the binocular camera, how would you mount them? If they are mounted so that any distant point in say the right-hand picture is 2¾ inches from the same distant point in the left hand picture, is this sufficient? and is it of no consequence how the two pictures are cut at the edges? Should not the right-hand picture exhibit *more* of the left side and less of the right side of any subject than the left-hand picture, and *vice versa?*—I am, yours, &c., BLIND EYES.

[Our reply was intended to apply to pictures taken by the bi-lens camera—not by one on Latimer Clark's principle. In the latter case the adjustment should be made in the camera before taking the picture—that is to say, so that the most distant object in one view should fall at a given distance (say 2¾ inches) from the corresponding object in the other picture—then of course no further adjustment is necessary, it having been made once for all in the negative. With regard to trimming the edges of the views, there is room for improvement upon the usual plan, which is generally a case of "happy-go-lucky." Your notion is correct; but, as you cannot make every one attend to this requirement, the simplest plan is to introduce a pair of diaphragms, properly arranged, into the stereoscope itself: they should be rectangular apertures, with their corresponding edges a *less* distance apart than the *nearest* corresponding points in the pictures (say 2¼ inches apart). The diaphragms may be cut in a slip of thin wood, metal, or even cardboard, blackened and placed immediately in contact with the pictures. We believe that M. Claudet was the first to draw attention to the fact that a diaphragm placed as described always appears nearer than the picture, while, if the corresponding sides are wider, it appears behind it—a fact easily explainable.—ED.]

TONING THEORY.

To the EDITOR.

SIR,—I have but just read your article of the 1st of this month, owing to having been much occupied.

You only do me justice in thinking that my observation about getting out of answering one remark by taking hold of another was made without malice. I should have said that your attention seemed to be so attracted by the one remark that you forgot to answer the other, but to this day it remains unanswered. Now, "in sober earnest," I do wish to know what you consider is the action of the hyposulphite on the alkaline-toned print

which produces the great change of tint, even after the said prints have been well washed after the alkaline bath? I believe it to be a sulphurising action: if I am wrong I shall be glad to be set right. One remark in your article I cannot quite agree with, viz., that the deposit caused by the mixture of chloride of gold and hyposulphite of soda is soluble in a large excess of the latter; being a deposit of sulphur, it is quite insoluble in hyposulphite.—I am, yours, &c., CHARLES HEISCH.

Blackheath, April 23rd, 1861.

[We defer replying to the preceding till our next.—ED.]

COLLODIO-ALBUMEN.

To the EDITOR.

SIR,—For several years I have been working hard at the various dry processes and the turpentine and waxed-paper. I have succeeded moderately with the latter, but best of all with the "Taupenôt." I have only one difficulty in this process, viz., I cannot get foliage: it is always so transparent in the negative that it prints all in one mass, and the high lights are mostly so dense that they require very long printing. The enclosed print is an illustration: it required twenty hours' exposure in the sun. The *trees* were masked after about four hours exposure in the printing frame, and the sky is backed out.

Can you, in your notices to correspondents, inform me how to proceed in order to obtain good definition in foliage and less opacity in the high lights?

I use "Keene's collodion." I expose generally for such subjects as this print about thirty minutes in good light. Three-inch landscape lens, fifteen-inch focus, quarter-inch stop. I develop in gallic acid. I do not use very much silver in developing.—I am, yours, &c., J. SHAW.

[Your proof indicates very great *over-development* of the negative. With so long an exposure as you name, you ought to obtain all the details in both shadows and high lights. But you employ a needlessly small diaphragm to your lens: you may well have it half-an-inch in diameter. Add half a grain of bromide of ammonium to each ounce of your albumen, and do not carry your development further than enough to get all the details well out. Remember your negative will be actinically more intense than it appears, and after trial of a print you can always develop more if needful.—ED.]

SPOTTY PROOFS.

To the EDITOR.

SIR,—On looking at some photographs printed by me about two months ago I find them covered with little green spots, similar to those on the portrait enclosed; and, being considerably puzzled to account for their appearance, I take the liberty of troubling you, hoping to obtain information through the medium of your valuable Journal.

My pictures are printed on albumenised paper, highly sensitised, toned by the alkaline gold process (with carbonate of soda and citric acid), and mounted with a solution of Nelson's patent gelatine. I should be disposed to attribute the spots in question to imperfect fixation; but I see no traces of that in some other unmounted prints which underwent precisely the same process. They certainly *cannot* be due to any want of washing.

If you can kindly enlighten me as to the cause of this unexpected vexation, you will confer a great favour on yours, &c.,

A VICTIM OF MISPLACED CONFIDENCE.

[We cannot perceive the green colour to which you allude, but notice little spots of decomposition of the albumen, arising most probably from a fungoid growth, due to some kind of moisture. It is not unlikely that the proofs have never been properly dried after the mounting before packing them together. We have no doubt that the gelatine is in this case the culprit. We notice, by the way, that your negative is much "out of focus."—ED.]

THE TANNIN PROCESS.

To the EDITOR.

SIR,—Allow me to say a few words in favour of the new tannin process. Its simplicity and certainty are very much in its favour, and the results are quite equal to wet collodion. In working it I found great difficulty in getting the solution of gelatine recommended by Mr. T. F. Hardwich to flow over the plate, but I have adopted another plan, which is equally efficacious. After the plate is cleaned take a brush filled with dilute albumen, say one ounce to three of water, and pass it over the edge of the glass for about a quarter of an inch. The collodion will now adhere with great tenacity, and bear any amount of washing without allowing the water to get under the edge.

The only difficulty I have met with has puzzled me exceedingly. I prepared some plates with the same collodion, &c., and dried under the same circumstances; but two of them, on being wetted previous to development, appeared to wrinkle all over. One of them broke up in the washing; but, by great care, I managed to save the other.

I would recommend all interested in dry-plate photography to give the process a fair trial.—I am, yours, &c.,

34, *Castle Street, Liverpool.* WM. KEITH.

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle-street, Liverpool.

ANSWERS TO CORRESPONDENTS.

ERRATUM.—In Mr. Dawson's paper, published in our last number, instead of "it diminishes upwards," read "it *increases* upwards."

J. H. S.—We have inserted your query.

H. M.—Of no intrinsic value whatever.

F. R. T.—It was unavoidably postponed.

N. W.—A twin-lens stereoscopic camera is preferable.

INQUIRER.—You can get a stereoscopic outfit for £6 or £7.

R. M.—You will find all necessary details in our little Almanac for the current year.

OLDHAM.—Damp the mount all over with a clean sponge, then paste on the proofs: they will not cockle.

ROBT. H.—We should prefer the turpentine waxed-paper process for the long tour you contemplate.

A. Z.—Ten per cent. means ten ounces of hypo. to one hundred of water, equal to two ounces to the pint.

X. X.—Aluminium being but one-third the weight of silver and double the price per ounce is still the cheaper of the two.

S. FARNWORTH.—Your letter arrived too late for reply in our last, but you will have perceived that we anticipated your wishes.

SPEC.—You have probably added bicarbonate of soda instead of the carbonate. Boil the whole in a glass or porcelain vessel.

ARGENTUM.—Most of the nitrate of silver sold is slightly acid; so, before adding acid to your bath, test it to see if it be not acid enough.

AMATEUR (Norwich).—Why not try the tannin process of Major Russell's devising? or else the simple albumen process given in our last?

W. H. HAYES.—You can easily procure an achromatic meniscus lens from any optician. State the diameter and focus you require.

T. R.—Prices vary with the quality, although it must be considered that some dealers are satisfied with much less profit than others.

S. M.—Your exposure has been insufficient: you will require at least thrice as long to penetrate the deep shadows on the left side of the picture.

SAMUEL T.—You had better master the wet collodion process before you attempt the collodio-albumen processes, else you may become discouraged.

F. B. (Maidstone)—See the sixth edition of Hardwich's *Manual*. We know of no other work which contains the information which you are seeking.

J. R. (Manchester).—The deposit is iodide of silver. It is best to decant the silver bath without disturbing this sediment, and filter through paper.

F. A. B. (Dulwich).—We have never seen anything in iron-printing that is comparable to a good silver print, and we quite despair of its rivalling the latter successfully.

ROBERT MACAIRE.—We recommend common fir for the purpose of making a tripod; but, if you object to that, use plain Honduras mahogany. Ash is in our opinion too heavy and elastic.

R. G. (Bembridge).—Your note was mislaid by one of the people in the publisher's office, and we were unable to help him to the name of the correspondent when applied to. You will no doubt ere this have had attention.

DUBIOUS.—It is impossible to say what state your bath is in: it appears to us as complex as the contents of the witches' cauldron in *Macbeth*. You had better precipitate the silver by a strong solution of common salt.

E. H.—Make a solution of gallic acid one ounce, in five ounces of alcohol and two drachms of acetic acid. For a developer take one drop of this mixture, and add to it a drachm of water with a few drops of silver solution.

FEARFUL.—It is useless to expect to produce *brilliant* positives on glass, if you fix with hyposulphite of soda; but if you use a weak solution of cyanide, and throw it away when you have used it, you need have no fear of the fumes.

Q. E. D.—Your strictures on the individual are truly well deserved; but we should not like to publish them, as our motives might be misunderstood, although he has treated us very shabbily. Give him full swing, and he will be sure to bring down retribution on his own head in time.

McQ.—Not properly toned; you must have allowed bubbles of air to remain under your proofs while in the toning bath. Touching the face of the proof with the finger before toning sometimes produces a spot, the resulting greasiness preventing the ready contact of an aqueous solution.

G. W.—You are mistaken: somebody else has made an attempt to imitate our usual form of such articles; but we had hoped that the *style* would not have been mistaken for ours, notwithstanding the adoption of a quotation which we selected a short time back as descriptive of a certain waterfall.

P. R. D.—Your sitter has been placed near a window, and no light reflected upon the shaded side of the face; this it is which causes the very great contrast that is so unpleasant. Throw a sheet or tablecloth over a clothes-horse, and place it opposite the windows, so as to throw a slight reflection on the sitter.

L. S. D.—We are unable to give you any information about the *commercial* value of negatives. Much will depend upon the localities of the subjects as well as on their pictorial excellence, because those that are readily accessible can be more easily reproduced by other operators, and, if popular, put in competition. Messrs. Negretti and Zambra, of Hatton Garden, London, are very enterprising publishers, and if your subjects are foreign ones you might apply to them.

J. PATERSON.—Personally we abominate the whole tribe of *folding* cameras, consequently we are scarcely fitted to recommend one to you. We can more readily warn you against certain objectionable points in some. For instance, avoid all in which the body consists of black velvet, which holds the dust and is almost sure to cause spotty plates. See that the front and back are both firmly attachable to the base-board, and especially that the latter is sufficiently rigid to prevent the movement of the image on the ground glass; and lastly, make sure that the whole when in use is light-proof.

OLD HUMPHREY.—Both the Editor of *Humphrey's Journal* and Herr Paul Liesegang are in error as to the date of the first publication of this Journal. It was first issued as the *Liverpool Photographic Journal* on the 1st January, 1854, and *not* in 1855. Herr Liesegang is therefore wrong in his chronology of photographic literature, so far as we are concerned. Like our correspondent, we have been rather amused at the warmth which our venerable transatlantic contemporary exhibits in putting forth his claim to *antiquity*. We hope it will be long ere he descends into a "*green* old age." Our wag of a correspondent also hints that his namesake, *Old Humphrey*, had better at once arrange with the publisher of this Journal for its republication entire in New York, seeing he is such a thorough "freebooter" at present. *We* have no objection, in lack of "original" matter, that his readers should be persistently called upon, not merely to sip, but to drink deeply at "THE BRITISH" fountain. We pardon the liberty our aged friend takes with our columns, seeing HE has the candour—not always found in the literary "*free* traders" connected with our art on both sides of the Atlantic—to acknowledge the source whence he has derived the "annexed" articles. He says he is "modest!" We are glad to find he thinks so: we confess we should have never found it out—indeed *we* have always had a "notion" that that was a weakness our transatlantic brethren was seldom troubled with. However, we "live to learn" as well as "learn to live."

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 142, Vol. VIII.—MAY 15, 1861.

Amateur Photographers' Publishing Association.—We have so frequently had applications from many of our readers for information upon the following points, viz.—

How to get a few copies from their negatives carefully printed?

How to render a few good ones available for procuring a variety by exchange with other photographers?

How to make their hobby self-supporting?

—that we derive considerable satisfaction in being at length able to indicate a course by which these problems may probably be solved. We have for several months past been engaged, with some other gentlemen, in maturing the details of a scheme by which all the advantages of an exchange club upon a very extensive scale may be placed within the reach of every photographic amateur. In doing this, one of the principal objects kept in view was to afford equal facilities to those located in the provinces as to residents in the metropolis; and another to render the scheme available to the producer of a few good negatives as well as to the Dives who rejoices in a large collection—and that in such a manner that while the abundance of the latter ministers to the requirements of the former, equal justice shall be meted out to all. In working out some of the details of the plan a considerable amount of labour and much consideration had to be devoted to many of the questions involved; and this gave rise to the idea of grafting some other collateral advantages upon those originally proposed to be attained, especially such as we have hinted at in the commencement of this paragraph. The result has been the formation of the Amateur Photographers' Publishing Association under auspices which we feel confident are well calculated to ensure triumphant success. For particulars we refer our readers to the circular distributed with and enclosed in this number of the Journal; and we are authorised to state that any inquiries for further information, if needed, will be readily supplied by the Secretary, Mr. Melhuish, through the medium of our columns. It is, we believe, pretty evident to those conversant with the progress of our fascinating art, especially during the last two or three years, that an immense number of valuable negatives are in existence all over the country from which the photographic public, and in many instances also the owners even, receive little or no benefit; but it is hoped and fully anticipated that the new Association will afford the means of disinterring, as it were, these buried treasures, and therewith enriching its members—not only without impoverishing the lawful owners, but, on the contrary, increasing the value of their property by making it fruitful.

Amongst the most cherished objects of the promoters we must reckon also the wider diffusion of a love for, and appreciation of, our art-science, which can scarcely fail to be extended over a much larger area than is as yet under its civilising influence. One of the means to this end is the admission of non-photographers to a share in the advantages offered by the Association; and it is considered that the arrangement made for this purpose combines justice to the one class with liberality to the other. In all the rules adopted, and the regulations that may yet have to be made, the guiding principle has been, and is to be, that of mutual advantage, unfettered by exclusiveness or protection (we use the last word in a political sense), but seasoned with a progressive and liberal policy. In conclusion, we have simply to remark that any suggestions with which we may be favoured in connexion with this matter will meet with careful and attentive consideration.

Alleged Permanency of Developed Prints.—We publish in another column a communication from Mr. Lyndon Smith, upon the subject of developed prints, which calls for a remark or two from us—of course disregarding the little flavouring of *sauce piquante* with which he has seasoned it—trusting that the majority of our readers do not regard us as such a "hedgehog" as the remarks of our contributor would imply that we are held to be in his estimation.

With regard to the "undisputed permanence" of developed prints, we have seen not one but several which have shown unmistakeable signs of fading. With regard to their care and treatment we have not been able to testify anything from personal knowledge, but they were alleged to have been kept with all ordinary care between the leaves of an album. We are by no means ready to assert that Mr. Smith's print "contains *within itself* the seeds of decay;" but unfortunately we are not prepared to admit the stability of gallate of silver to be proven. The absence of change of colour in the weak bath of hyposulphite of soda is certainly a strong point in its favour; but we are still of opinion that as it does not resist the action of oxidising and sulphurising chemicals—both of which are present in the atmosphere to some extent—while prints properly toned with gold do resist the same in a very considerable degree, the latter must stand a better chance of persistence under all probable circumstances than the former. If we have no indisputable proof that the material of a gold-toned print is mainly metallic gold, still less has our correspondent any stable ground for asserting that it is not so, while presumptive evidence we believe to be decidedly in our favour. Gold in a minutely divided state is not necessarily blue. But this is beside the question, as our object is not to prove that the ordinary prints are superior to those produced by Mr. Lyndon Smith's formula, but merely to record a protest against its being admitted as yet *proved* that the latter are permanent. We hope they may be so, but we are not quite sanguine upon the point.

With regard to the treatment of the subject of the picture with which Mr. Lyndon Smith has favoured us we are perfectly satisfied. The tone of the proof is good, and there is plenty of detail; but—alas! that there should be any *but*—there is an absence of atmosphere and also of transparency in the shadows. And this is precisely the point upon which we took exception before: we said nothing about half-tone. It is the absence of these qualities, so necessary to artistic perfection, which made us

regard albumenised paper *for the present* as a disagreeable necessity. We say for the present, because we do hope that, ere long, this reproach against plain paper will have ceased to exist. If we could manage to retain the albumen in the deep shadows only and get rid of it elsewhere, as in the proofs where bichromate of potash is used in conjunction with albumen, a step of importance would have been gained; but, however the problem may be solved, give us the two qualities yet wanting in the proofs produced by Mr. Smith's process, and we shall readily admit that, from an artistic point of view, it is perfect.

Old or New?—There are several points in the letter of our esteemed Paris correspondent, M. Ernest Lacan, which we published in our last, that demand a few words of comment from us. The most important we shall leave for the moment, and therefore commence with the announcement made—"that M. Lavoyne, an amateur, has been experimenting successfully with honey and water (!) as a preservative agent for collodionised plates, and that with an iron developer tolerably rapid negatives may be obtained." We certainly were under the impression that this had been given to the photographic public some seven or eight years ago as the result of our own individual experiments—in fact *immediately* following the publication of Messrs. Spiller and Crookes' method of using nitrate of zinc for the purpose of retaining moisture in the film, and contemporaneously with a nearly identical process, intended to produce extra sensitiveness, by Mr. Maxwell Lyte. Our readers will of course be, for the most part, sufficiently familiar with these facts, though it is not surprising that our worthy correspondent is not better informed on the matter, as at that time our French brethren were under the rroneous impression that photography was almost unknown in England. For the same reason we are scarcely surprised to find that the automatic operating chamber, introduced by M. Anthony, is regarded as something *new* in idea, if not very practicable; but to those who were present at the London Photographic Society's March meeting of the year 1856, on which occasion the Camera Chora was exhibited and explained by Mr. East [see *Journal of the Photographic Society*, vol. III., p. 9], it will be evident enough that the *idea* at least is not new, even if the instrument itself be not identical with that then shown. In Mr. East's apparatus, as in that of M. Anthony, the collodionised glass being put into the instrument was by means of an external knob immersed in the sensitising bath, withdrawn, and placed in position for exposure; after which, by aid of several other knobs, the development, washing, fixing, &c., were all performed in a most ingenious manner, it is true; but we fancy that flexible sleeves, admitting the arms of the operator, were preferred by the majority. Thirdly, the employment of acetic acid and alcohol, in order to increase the sensitiveness of a plate, by M. Selmer, of Berghem, was long since anticipated by our own countryman, the Hon. H. Fox Talbot—the principal focus of English photography, if we may so term him. In his case the mixture was used in conjunction with albumenised plates, into which they were dipped—the operation comprising a portion of the process by which the highly sensitive plates were prepared for taking an impression from a printed bill fixed to a wheel, which impression was obtained during the rapid rotation of the wheel, the bill being momentarily illuminated by a flash from an electric battery. The experiment indicated was performed at the Royal Institution, in the presence of a large audience, and was recorded in the *Athenæum* about the time, A.D. 1852. As the matter is one of very considerable interest at the present moment, we will endeavour to seek out the account, and reproduce it for the benefit of our readers—to most of whom it will be, in all probability, quite new.

Albumen Process.—Had M. Lacan been acquainted with Mr. Negretti he would have known that the latter is above making a false assertion, and that therefore in all probability some misapprehension exists. We thought it our duty to specially direct Mr. Negretti's attention to the implied charge against him involved in M. Lacan's report of M. Ferrier's assertion relative to his never having instructed Mr. Negretti in his method of operating.

Mr. Negretti, in a note of reply [see page 192], positively asserts that he originally learnt the process from M. Ferrier, as stated by him when describing the same before the Photographic Society on 1st March, 1855; that M. Ferrier, when teaching him, supplied him with a whole-plate negative as a standard to work up to, which negative he also exhibited on the night of his lecture. A report of Mr. Negretti's lecture, containing his acknowledgment of obligation to M. Ferrier for instruction, was inserted in the *Journal of the Photographic Society* at the time; and has therefore been published for upwards of *six years* without contradiction until the other day. The solution of the mystery therefore probably is, that M. Ferrier has adopted of late some modification of his former process, and imagines that Mr. Negretti has laid claim to a knowledge of the details of his present modified mode of operating. We may remark that we took the initiative in re-publishing Mr. Negretti's method in a condensed form in consequence of numerous applications from correspondents after our critique upon Messrs. Negretti and Zambra's Javanese stereographs. We had the abstract verified by Mr. Negretti; and had he been less modest and omitted all mention of M. Ferrier's name, though he would not have been so scrupulously just, he would in all probability have escaped the odium so undeservedly attempted to be cast upon him. In making these remarks, of course we would not for a moment be understood as implicating our worthy friend, M. Lacan, who simply reports for our information that which he undoubtedly heard alleged in Paris, and who could have no personal knowledge of the matter in dispute. In conclusion, so far as our readers are concerned, they have the actual process employed in the establishment of Messrs. Negretti and Zambra; and, whether M. Ferrier disowns it or not, its value is not the less indisputable.

American Photographic Lens.—Not long since we made a comment on the announcement in the pages of a transatlantic contemporary of the introduction of a new photographic lens, which was stated to "cover" a flat field of 180° angle of view. So much of the particulars of construction of this apparently very desirable instrument was given as to the extent that the outer curves of the two terminal lenses (if we may so designate them) were located in, and formed part of, the circumference of the same circle. We remarked at the time that we felt convinced that some error had crept into the report given. An English contemporary, in commenting on the same circumstance, stated, and truly, that the assertion made was not in accordance with theory. Our American brother meets this objection in a truly philosophical manner: he says—"so much the worse for theory;" but coolly admits the trifling (!) error of having made the assertion with respect to an angle of 180° when he meant 90° instead.

The Oldest Photographic Periodical.—A dispute for this honour is now being carried on between the rival editors of two of our American contemporaries that involves some rather comical features. One of them quotes dates some of which we know to be erroneous; the other, in addition to falling into a similar error, claims precedence in age because another Journal published long since and which is now extinct has been, to use the editor's own word, *merged* in the one over which he rules. This strongly reminds us of the story of the antique penknife of undoubted authenticity which had belonged to the owner's great great grandfather when a schoolboy, and which had been retained in the family the whole time and kept in good repair, having had no less than thirty-five new blades and fourteen new handles—so that there could be no mistake about its being the identical knife.

Closing Words.—With the current number we give the concluding portion of the extended and valuable series of "Practical Instructions on Colouring Photographs," by our esteemed contributor, Mr. Alfred H. Wall; and we cannot dismiss the subject without a few valedictory observations. The pre-eminent feature for which the whole series has been distinguished is that of its unquestionable practical nature. It has been treated by one who is intimately familiar with the subject—not from mere book knowledge, but from constant daily actual use of the pencil and palette. The intelligent communication to others of knowledge acquired by diligent, patient, and laborious study has been more the object than mere literary elegance of style; and, judging of the value of the lessons imparted by their appreciation on the part of those for whose benefit they were undertaken, we have no hesitation in asserting that they have attained a deservedly high reputation. The liberality with which Mr. Wall has given to the public that which he has won by plodding industry, combined with acute intelligence, is beyond all praise; and we sincerely trust that, in his new establishment in Bond-street, where he has recently located himself, in order to follow the occupation of a professional artist-photographer, he will meet with that public patronage which his merits so richly deserve. Although the ink is now dry in our contributor's pen, the colour is still moist in his pencil; and those who desire further instruction can readily obtain it by joining his classes already formed in Bond Street.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XXIII.

By the experiments and analyses of Mr. Dawson, lately reported in this Journal, the question of the hydrometer silver meter may be considered as settled; and we are glad to take an early opportunity of thanking that gentleman for the pains he has bestowed upon the construction of a specific gravity table, which will be highly useful to photographers. All will appreciate the advantages of having such a table ready to hand, and in works on photography, or on photographic chemistry, it will fall naturally into its proper place in the appendix. The article which we ourselves communicated on the hydrometer was intended principally to show that the introduction of a salt like nitrate of ammonia into the bath did not disturb the working of the instrument to so great an extent as would be anticipated, inasmuch as nitrate of ammonia produces a larger amount of expansion in the liquid than is usual. Our information on this subject was derived from the perusal of papers by Messrs. Lyon Playfair and Joule, in which the authors showed, by conclusive experiment, that the specific gravity of a solid was often changed in the act of dissolving in water, so that the weight of a given bulk of the solution could only be determined by actual trial, and might be be either more or less than that indicated by the known density of the body. With the results of the March meeting of the North London Association before us it will not be necessary to reopen the question; but we may observe, in passing, that the contending parties were never less at variance than a casual looker-on might have supposed—the hydrometer being advocated simply on the ground of practical utility, and not as an instrument scientifically correct. Mr. Cramb may be assured that the friendly tone of his last letter is reciprocated in all that has since been spoken or written upon the subject.

Whilst speaking of the bath we would take the opportunity of making a few concluding remarks on commercial nitrate of silver, since we observe that it is undergoing a further discussion at the meetings of the societies. A large dealer, whom we consulted not long since, assured us that he was really at a loss to know what to do or whom to believe, some of his customers contending that the difficulty was an imaginary one. Scepticism will always prevail in photography, and perhaps, from the nature of the subject, there is some room for it; but, as regards nitrate of silver, it is certain that an impurity of a very injurious nature is frequently present, and that the difficulties complained of do not depend upon the collodion nor upon any peculiarity in the illumination of the subject. Those who employ *bromo*-iodised collodion will not perceive the effect so plainly as in working with collodion simply iodised. But in the latter case we venture to give this advice, viz., to view with suspicion any sample of nitrate of silver which evolves a fragrant smell (such as nitric acid will occasionally produce in oxidising organic matter), or which *froths* when its strong aqueous solution is stirred briskly with a rod. The purest commercial nitrate of silver may give a strong acid reaction to test paper; but this is of no consequence in photography, since the free nitric acid can easily be neutralised. In spite of what was said at the last meeting of the North London we are still convinced that this impurity is of organic origin, and most probably gains entrance with the nitric acid used in dissolving the silver. We know of no satisfactory mode of eliminating it; but its effect of weakening the intensity of development may be overcome by adding fractional quantities of acetate of soda to the bath.

Regarding the most convenient mode of neutralising a bath, we cannot perceive the advantage of preparing an oxide of silver *purposely*, and thus adding one more to the list of photographic chemicals. If a bath has become acid by long use the operator should consider, in the first instance, whether collodion containing iodide or bromide of *ammonium* has ever been dipped in that bath. If so, nitrate of ammonia is present, and care must then be taken to avoid adding the neutraliser in excess, since oxide of silver and carbonate of silver are both soluble in nitrate of ammonia, and hence the solution would easily be rendered highly alkaline. Considering the frequent use of bromides in the photography of the present day, we may assume that nitrate of ammonia is usually present in old baths, and that the substance employed to neutralise ought, therefore, to be dropped in cautiously. But in what respect oxide of silver can be esteemed superior to *ammonia*, we are at a loss to conceive; or to carbonate of soda, which, in our own practice, is never found to evolve enough carbonic acid to interfere with the visible change of colour in the litmus. We are now speaking of an old bath, known to contain nitrate of ammonia: a newly-prepared bath, free from nitrate of ammonia, may be neutralised very simply, by rendering it milky with excess of carbonate of soda, and subsequently filtering through porous paper. Alkali, or rather *oxide*, is thus left in the liquid in a free state; but the quantity is definite, and without employing test-papers experience teaches the operator that a minim of glacial acetic acid to each six ounces will more than neutralise it.

The next matter which struck us as being worthy of comment in the discussion above referred to was the employment of *zinc* to reduce chloride of silver to the metallic state. We have had abundant opportunities of seeing that process carried out on a large scale in an assay office, and can assure our readers that it answers perfectly, even with many pounds weight of the chloride, provided the proper precautions are observed. It is indeed true, as Mr. Dawson remarked, that a white sediment of chloride of silver may remain on dissolving the spongy silver in nitric acid; but one of two causes would in all probability explain this:—either the grey mass was insufficiently digested in warm water, acidified by sulphuric acid, in which case a partially soluble salt of zinc, known as an oxy-chloride, remains behind—or the precipitated chloride of silver contained organic matter, and, in consequence, the transfer of the chlorine from the silver to the zinc was incomplete. On the whole, we think this process will not meet with much favour from photographers, although it is a very convenient one in the chemical laboratory. A small quantity of well-dried chloride of silver would be more readily reduced by rubbing it up with excess of precipitated chalk, and projecting it by small portions at a time into a hot crucible.

The next observation made at the meeting is at variance with our own experience. The difficulty of melting nitrate of silver, without converting it into nitrite, was alluded to; but we have never met with any such difficulty. The question turns upon the proper test for *nitrite;* and if it can be shown that absolutely pure nitrate of silver has an alkaline reaction, then alkalinity ceases to indicate decomposition.

Some time since we dried a quantity of nitrate of silver at a few degrees above boiling water, and sent it to Messrs. Johnson and Matthay to be crystallised. The crystals, as returned to us, perceptibly changed the red colour of the litmus-paper to blue, and from that time we have felt little doubt as to this reaction being proper to nitrate of silver. Observe, however, that the aforesaid crystals were not alkaline to turmeric-paper, and hence it is probable that the restoration of the blue colour to reddened litmus is an exceptional circumstance not to be accounted for, and similar to what we see in the case of ether.

PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION OF 1862.

THE following correspondence has taken place between Her Majesty's Commissioners and Chief Baron Sir Frederick Pollock, as President of the Photographic Society, relative to the appointment of a committee to advise the Commissioners as to the arrangement of the photographs expected for exhibition. Sir F. Pollock's reply is very pertinent; and unless some concession be granted, in accordance with the representation made, we fully anticipate that the collection sent in will be confined exclusively to the works of the sappers and miners engaged at the South Kensington Museum, for we presume that none of our artist-photographers will care to exhibit their productions if placed on a footing below that of Manchester printed calicoes. We very much applaud the course adopted by the Society in not acceding to the request for a committee until the result of the very reasonable remonstrance is known.

INTERNATIONAL EXHIBITION, 1862.

454, *West Strand, London, April* 26, 1861.

SIR,—I am directed by Her Majesty's Commissioners to forward for your information the enclosed copy of the decisions which they have published up to this date, on points relating to the management of the Exhibition of 1862.

Her Majesty's Commissioners having had under consideration the arrangements that will be required for securing an adequate representation of the various branches of industry of the United Kingdom, and having had the benefit of the advice of a large and influential Committee whom they specially consulted on the subject, have determined to organise those classes of the Exhibition, which appear to admit of such an arrangement, by means of Central Committees, and to invite the co-operation of such Societies or other public bodies, as are generally recognised as the representatives of these classes, in the selection of the members of the several Committees that will be appointed.

One of these Committees will be formed in connexion with the Class of "Photographic Apparatus and Photography" (No. 14); and Her Majesty's Commissioners have directed me to inquire whether the Council of the Photographic Society would be willing to submit the names of six or eight gentlemen whom they would recommend for appointment as members of such Committee.

The duties of the Committee will consist generally in advising Her Majesty's Commissioners on the measures to be taken for obtaining an adequate representation of the class with which it is connected—in examining the demands for space sent in by intending exhibitors, which will be classified and submitted to the Committees in a condensed form by the officers of Her Majesty's Commissioners—in encouraging the production of suitable objects for exhibition—and in settling the final distribution of space among the exhibitors in the class.

Her Majesty's Commissioners trust that they may not only have the assistance of your Council in the selection of this Committee, but that the officers and members of your Society in general will give them the benefit of their co-operation, by communicating such information, or such results of their experience, as may seem likely to assist the Commissioners in those departments of the Exhibition with which the Photographic Society is mainly concerned.—I have the honour to be, Sir, your obedient servant,

F. R. SANDFORD, SECRETARY.

BARON'S ROOM, COURT OF EXCHEQUER,
Westminster, 6th May, 1861.

SIR,—I have to acknowledge your communication of the 26th inst., *inquiring* whether the Council of the Photographic Society would be willing to assist in appointing a Committee to advise Her Majesty's Commissioners on the measures to be taken to procure an adequate representation of Photographic Apparatus and Photography, Class No. 14, and *expressing* "that Her Majesty's Commissioners trust that the officers and members of the Society will give the benefit of their cooperation, and assist the Commissioners in those departments of the Exhibition with which the Photographic Society is mainly concerned."

I lost no time in assembling the Council, and laying before them your letter and its enclosure (containing the decision as to sections and classes), and I have been desired by the Council to communicate to you the result of their deliberations, in which I entirely concur. It appears to them that some mistake has occurred with reference to the objects of the Photographic Society—indeed to photography itself—which it is desirable to point out and have corrected before they appoint a Committee. The class to which their attention is directed is Section 2, No. 14, "Photographic Apparatus and Photography" (as if photography were nothing more than the mere mechanical application or use of certain apparatus, and to be considered of less account than the apparatus itself).

The section in which No. 14 is placed includes every species of machinery, implement, or tool which is used for the purposes of social life; and photography is the only *result* or *product* which is placed among the machinery or apparatus necessary to produce it. It furnishes the solitary exception to what is otherwise a universal rule. Even the paper on which a photograph is printed is put into a section above the machine that is used to make it.

In the investigation of the properties of light, upon which the visible phenomena depends, photography is as much a science as astronomy or chemistry. It has led to discoveries of the greatest interest and importance as to the composition of the rays of the sun, and the properties of the different portions of the solar spectrum, as was lately expressed in a part of Professor Faraday's lecture at the Royal Institute. It has also enlarged the bounds of chemical science, by ascertaining the qualities of a great variety of substances with which it had to deal; and it is in these respects chiefly that I personally have any connexion with it.

In the observations of natural scenery, and in the selection of what shall be represented with reference to the effect of light and shade, and from what point of view, in the grouping and arranging of the principal or accessory objects for the purpose of forming a picture, photography is, no doubt, an art—*an imitative* art. But the Council of the Photographic Society claim for it a position (however humble) among the *fine arts* (if etching and engraving may be so placed, as no doubt *justly* they may). Photography, quite as much as engraving, gives room for the exercise of individual genius, so as to stamp a special character on the works of photographers, and give to the result of their labours the impress of the mind of each artist.

The Photographic Society has been founded chiefly with a view to promote photography in connexion with science and the fine arts, and the members interest themselves about photographic apparatus in the same manner only as a Raphael or a Reynolds might select and use the most convenient easel, the best brushes, or the most appropriate and enduring colours—the instrument is comparatively nothing. Photography consists in the artistic use of any apparatus upon a subject properly selected, and occasionally arranged or prepared. They are quite willing to contribute as much as lies in their power to illustrate what photography has done, and is daily doing, in producing the most accurate copies of the finest works of art, ancient or modern,—in multiplying representations of the fairest or the wildest scenes of nature, and whatever art has done to adorn or improve nature in the building cities and constructing magnificent works and buildings of all sorts, from the cathedral or palace to the humblest cottage; from the bridge that spans a mighty river to the plank that crosses a brook, or in giving enduring pictures of private and domestic life. They do not complain that the apparatus they use is placed among all the other apparatus, but they do complain that results such as have been exhibited for many years by the Society, and have been honoured by the presence and encouragement of Her Majesty and H.R.H. The Prince Consort, are deemed worthy of no better place than among tools and mechanical devices of whatever merit; and they would appeal to the royal and illustrious patrons of their body to be rescued from the comparative degradation of being mixed up with the last improvement in ploughs or cart wheels, or ship's tackle.

The very clear and luminous arrangement of the articles to be exhibited gives the greater force to the objection of the Council.

Section 1 contains all natural substances, whether mineral, vegetable, or animal, which minister to the wants and comfort of man.

Section 2 contains all the machinery and apparatus (including instruments and tools of every description) that conduce to a mechanical end; and with one exception it contains nothing else.

Section 3 contains the result produced by Section 2 acting upon Section 1.

There is something so remarkably distinct and simple in the arrangement, that it is to be regretted that its beautiful simplicity should be marred by any exception; but photography as a result is put in Section 2. It is the only thing that is out of place in the whole arrangement. A result that involves *thought, selection, taste*, and *sometimes design*, is put among carpenter's tools and agricultural implements! The incongruity is not so glaring, but it is of the same kind as if architecture were placed along with trowels and scaffolding, or Humboldt were put among commercial travellers.

Section 4 comprehends all that genius and labour have done in the departments by common consent called the fine arts, in which engraving has been tardily admitted.

But at last it *has* been admitted (now one of the latest discoveries in photography is) that an actual engraving (without the use of any graving tool) can be produced by chemical agency and the light of the sun. Is the impression from the result of such a process to be received as an engraving (which most undoubtedly it is), and the other results of photography to be excluded? I am sorry to have troubled you at such length; but these are the views of the Council, which I have to submit to you in answer to your letter, and remain your obedient servant,

FREDERICK POLLOCK.

To F. R. SANDFORD, Esq.,
Secretary of H. M. Commissioners, International Exhibition, 1862.

ON THE PERMANENCE OF DEVELOPED PROOFS.

By LYNDON SMITH.

IT is quite encouraging to learn that there is any single point on which you can find it consistent with your editorial duty to agree with me, and very gratifying to know that you consider some of my humble productions "display a considerable degree of artistic excellence." I am afraid, however, that with regard to my "abuse of a certain method of treatment"—whatever that rather ambiguous expression may exactly mean—we must be "agreed to differ." I am glad you can commend my printing process, which you do me the honour of publishing: on trial I believe you will find it justifies all I have said in its favour.

You ask on what grounds I claim "undisputed permanence" for developed prints? On this principally—that no one, to the best of my knowledge, has ever produced a faded print done by the development process: I mean a print simply developed, *not* toned, and simply fixed, and which has been fairly treated afterwards—that is, cared for as a work of art should be. What do Mr. Hardwich's experiments prove? Only this: that photographic prints, if subjected to the violent action of chemical reagents, will be destroyed—some in a short time, others in a longer—a fact which it needed no lengthened series of experiments to demonstrate. The question to be determined is—does my print contain within itself the seeds of decay?—not, can I destroy it by subjecting it to certain abnormal conditions?

I believe a print on albumen paper does contain within it the seeds of decay: first, because the albumen will decompose in time, particularly if the paper become at all damp; and, secondly, because the material composing the picture—I am speaking of prints toned in any of the ordinary ways—is naturally unstable. It is not true to assert that this material is mainly metallic gold: if it were the picture would be a very deep blue, and unpresentable as a work of art. There can be no doubt that the majority of the prints now in our hands consist chiefly of unstable silver salts, the deposit of gold being very superficial: a very minute quantity of the blue gold deposit will tone down the red-brown colour of the untoned proof to the usual pretty chocolate and violet tints.

No one, I think, will be inclined to dispute the stability of the gallate of silver, of which a developed picture is composed, together probably with metallic silver; and, as the print does not change colour in the weak hypo. bath, we may be tolerably certain that it is not sulphuretted at all.

These are briefly the reasons for my asserting the undisputed permanence of my prints. If you can controvert them by argument or, more effectually, by producing a faded print which has been printed by development and *not* toned, you will put me and others right in a matter which is of paramount importance to our art.

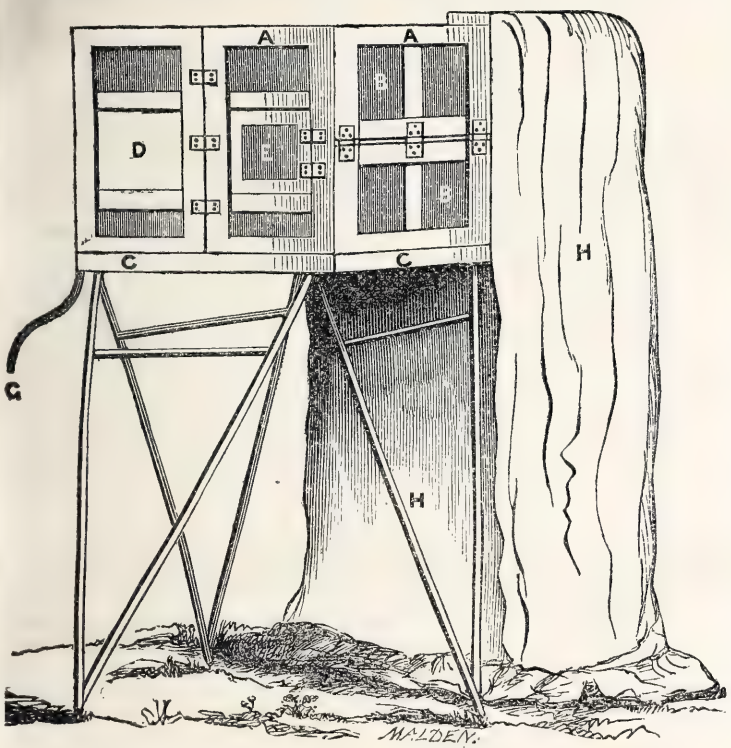
You admit that you "feel with me"—you *must* do if you have even a "considerable degree" of artistic feeling; and you will pardon my saying plainly, if you *know* albumen printing to be wrong and bad, you ought to use all your influence to stop the practice of

it. When the same energy and talent has been displayed in the improvement of the processes on plain paper that has already been concentrated on the albumen paper methods, there can be no doubt the former will give prints both permanent and all that can be desired in an artistic point of view.

The small print which accompanies this is not a brilliant specimen of my process, as the negative was taken on a very dull day; but it will show that half-tone need not necessarily be defective on plain paper.

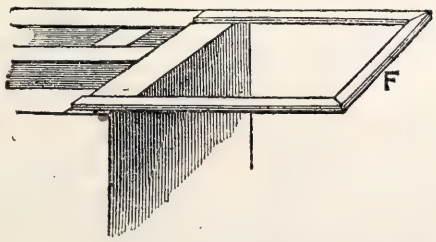
PORTABLE OPERATING CAMERA.

In describing this form of tent I beg to disclaim all originality in its construction; my object being solely to bring before my brother amateurs a very cheap, portable, and efficient form of dark room, suited alike for home and field purposes.



A Framework of deal, made very light. D Yellow glass window.
B Panels of thin millboard. E Door for ventilation.
C Base-board tray, 2½ inches deep. G Elastic pipe from swill tray.
H Black drapery or curtain.

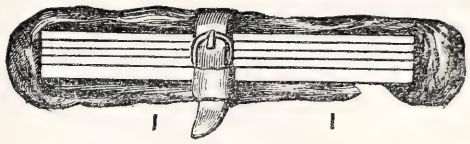
It consists of a box made like a folding camera, constructed of deal and millboard, hinged to a base-board or tray, two and a-half inches deep. The front folds to admit of easy package, and the drapery for the exclusion of light is nailed all round the back edge of the camera, and is capable of being extended twelve inches in a backward direction by means of a folding frame, thus affording ample room for the operator to stand whilst manipulating.



F Folding extending frame.

It is very readily erected: all that has to be done is to unbuckle the packing strap, render the front rigid by bolting it on the inside at top and bottom, and slip it into the groove prepared for its reception in the dark chamber, shake out the drapery, and place the frame-work on the tripod legs—the whole proceeding taking less time to do than to describe.

When erected it affords an operating-room thirty inches square, having a table thirty inches by eighteen inches, fitted with a tin sink, fourteen inches by twelve inches, to the right, well varnished with lac varnish, and furnished with an elastic pipe to convey away waste solutions and washing water. To the front of the table and to the left are attached two hooks or staples for hanging the nitrate bath. The front has a yellow glass window immediately over the sink, and a door or shutter capable of opening from within by its side, both measuring twelve inches by eight inches: lighting and ventilation are thus well provided for. The frame-work is painted white outside and flatted a dead black inside.



I Tent packed up.

It will be perceived that the great advantage in this tent is the small number of *detached* parts, as it consists only of frame-work, front, and tripod legs—the whole packing into a parcel measuring thirty inches by eighteen inches by six inches, and, if well made, weighing under fourteen pounds. H. R. R.

THE NEGATIVE ALBUMEN PROCESS ON GLASS.

By John Crame.

[Read at a Meeting of the Photographic Society of Scotland, April 9, 1861.]

I neither come before you with an important discovery in our art nor with a new process of which I am to predicate before unheard-of results. My subject is an old process, not so generally known as it should be, nor so much esteemed as its merits deserve. Albumen was pressed into the photographic service at a comparatively early period in the history of the science, when trifling improvements were either made the subject of a patent monopoly or kept a profound secret; hence it may be that its progress was slow, and that even yet we find fewer operators in plain unadulterated albumen than in any of the myriad of dry collodion processes. Nor am I here with a new, or it may be improved, albumen process. I am careful thus to explain, as I am scarcely forestalling criticism when I say that some one may after perusing my paper say I had nothing to communicate, and therefore need not have come here to occupy your valuable time. I have frequently said so myself when I have been urged to write on this subject; that, in fact, though there might be something peculiar in my method of working in albumen, I scarcely know that I could single out the new or peculiar part, if such existed. I come here to-night, then, to tell my photographic brethren the exact manner in which I have been able to obtain several thousands of fair negatives with, I think, the minimum amount of trouble and the maximum amount of certainty.

Before I had tried a single albumen plate I had formed a very high opinion of its capabilities, and I commenced it with a firm conviction that it *was* capable of doing for me all I wanted photography to do at the time; and I may add I determined not to be easily deterred from accomplishing my purpose. Mr. Negretti said, in introducing this process to the attention of the London Society, that many gentlemen gave up albumen before they had tried it. And, perhaps, had some of the handy dry collodion processes, so successfully practised now, been then known, I might also have proved faithless to my resolve, and, instead of being here the humble exponent of the claim of this beautiful and certain process, I might have been the enthusiastic advocate of the raspberry vinegar, the champagne, or infusion of tea process. Many a time, as a whole batch of plates proved a failure, did I resolve to try no more of it. Such resolves were soon forgotten, and I had soon encouragement in being able, one by one, to understand and overcome the difficulties of the process.

Without further preface I now give the details of my method of operating, beginning with the

GLASS.

Patent plate is, I think, undoubtedly the best for this process. The albumen film is generally dried with the glass, carefully levelled; hence any inequality in the glass tells seriously in the future picture. Fine *sheet* glass, such as that sent out by Messrs. Chance Brothers, of Birmingham, and the St. Helen's Company, I have used successfully; but, if expense be not a serious consideration, I would say patent plate is much the best.

CLEANING THE GLASS.

In all dry processes it is very desirable that the glass should be very carefully cleaned. A plate which would seem quite perfect on the score of cleanness, but which had been so exposed as only to require a few minutes development, would, if it had been other-

wise exposed so as to require prolonged development, appear a mass of dirt, and, in consequence, no picture, or one of little value only, would be obtained. Some gentlemen have so described the cleaning of glass for albumen as, I think, may have aided in frightening amateurs about the process. There is nothing, so far as I know, peculiar to albumen over any other dry process on glass on this head. My practice is to immerse the glass for some time in a saturated solution of common washing soda. I then wash with abundance of water, and dry out of the water with a linen cloth. I never could succeed, with any degree of steadiness, with leather for drying and polishing. I give a final rub, mostly to remove dust, with a piece of clean silk, just before proceeding to coat.

PREPARATION OF THE ALBUMEN.

I have not in my usual practice added either honey, gum arabic, dextrine, sugar, or treacle to the albumen; and whenever I have done so by way of experiment, the result has not encouraged me to continue their use. The addition of those substances has been recommended by those whose position entitles them to consideration; but in my experience I have neither felt the necessity for their addition nor the promised advantage when I have tried them. I have always preferred the use of simple substances, as far as possible, in my photographic practice.

The whites of any kind of eggs, I presume, would do. I have tried the whites of hen eggs for the most part: new-laid country eggs are decidedly to be preferred. Opinion has been a good deal divided among photographers on the question of whether stale albumen will do or not. My experience of a very large amount of operating in albumen, both on glass and paper, has now fully confirmed me in my first opinion, that allowing the albumen to become stale is always pernicious, though I must confess to having at times inclined strongly in favour of allowing it to decompose partially before using. The whites may be separated from the yolk in any way the operator finds most convenient. Let him be careful to keep the smallest amount of germ or yolk from passing among the whites. The quantity of albumen in which it is proposed to operate should now be thoroughly beaten. A good deal depends on this, as we will by-and-by see when we come to speak of the difficulties and objections to the process. The beating of the albumen may be accomplished in a variety of ways—shaken in a bottle, or beaten in a basin with a wooden fork, and in many other ways, not to speak of the many clever machines specially made for the purpose. The addition of a small quantity of acetic acid to the albumen, to make it fluid, has been recommended, and has also been the subject of some discussion. I have tried it, and find it to answer the purpose proposed.

IODISING THE ALBUMEN.

Iodide of potassium is the iodiser most usually recommended. Any iodide will do, I think, except those metallic iodides which coagulate albumen. Iodide of cadmium does so, yet it has been recommended, and pictures shown which were produced with its use. In my hands the addition of some iodide of cadmium to a basin of albumen turned it into a substance resembling sour milk. Iodide of ammonium has been much recommended. Its only advantage, I think, is that it generally contains a good deal of *free iodine.*

The addition of a bromide to collodion is now pretty generally recognised as advantageous. I have always used bromide in my albumen, and have no doubt I have obtained finer pictures than I could otherwise have got. A much shorter exposure *will do*, and, above all, it materially aids in getting *thin* pictures full of half-tone. Albumen, and indeed all dry processes, are apt to give harsh pictures if care be not exercised to avoid it.

The amount of iodide and bromide to be added is an open question, much depending on the purpose to which the plates are to be applied. I have no doubt that the degree of rapidity of exposure is in proportion to the amount of iodide, if the silver bath be suited to it. That conclusion, I am aware, is not in accordance with the expressed opinions of high authorities, but it is in strict accordance with my own experience. In a young science like photography, which as yet furnishes but a dim and shadowy explanation of the wherefore of the results we are every day witnesses of, it is perhaps as well to be more than ordinarily scrupulous in regarding facts—single observations, even though these may not accord with this or that *generalisation* of the most eminent authorities.

With plates which I wished should possess the highest degree of sensibility I have used as much as eighteen grains of iodide of potassium and twelve grains of bromide of potassium to the ounce of albumen.

The formula most usually given is about 1 per cent. of iodide of potassium or ammonium. That will do well enough, but will be slow and will give hard pictures. The addition of one-third of a bromide and a little free iodine will make it work *clean*, and give fine thin pictures. Say to each ounce of albumen—

Iodide of potassium..... 4 grains,
Bromide of potassium ..... 1½ „
and a very little pure iodine.

Dissolve these in as little water as you can, and add little by little, shaking or beating up the albumen as you do so.

After iodising and thoroughly beating up the albumen it should stand for some time. It will generally be ready in a day, or less.

(To be continued.)

REMARKS ON THE POSITIVE COLLODION PROCESS.

By JAMES EWING.

[Read at a Meeting of the City of Glasgow and West of Scotland Photographic Society, May 2nd, 1861.]

WHEN I look back in imagination to the first time I was shown a collodion positive, and consider the rapid strides that the photographic art has made in Glasgow since then, I am indeed led to marvel at it, as at that time, scanning with critical eye the sickly, consumptive image on the glass, strange repugnant impressions entered my mind. I little dreamt that after a few years into the future of photographic history, through the medium of this same phantom of watery birth, the streets of this city should be literally hung with the tempting triumphs of the art—that the house-tops should burst into photographic galleries—or that the two or three professors of the daguerreian art, then plying a most profitable trade, should be succeeded by a race whose "name is legion." No! my ideas certainly took not that direction; and as I placed the new-fledged "*vitriotype*" beside the shining daguerreotype plate, my notions in regard to the glass process were anything but enhanced by the comparison, although it had the honour of preserving the image *non-reversed.* Comparisons seemed odious: we resolved to hold on by that branch of the art which served up to our customers preserved sunbeams on silver plate.

But suddenly a cry went over the land that this *xylotype* strengthened day by day; that it rose stronger and stronger in public estimation; that it could be viewed in any light; and its greatest recommendation (one of intrinsic import) was that it could be made the matrix from which copies on paper could be multiplied to any extent, threatening to undo the patent of Fox Talbot—which it eventually did—and make photography on paper a free untrammelled gift to the world.

As suddenly it became apparent that the brilliant daguerreotype was not faultless; that its images were reversed; that instead of giving you the image of your friend's face it reflected your own; that blue hazes bespread its surface; and that a year or two sufficed to dim its glories. Ah, beautiful daguerreotype! first finished child of the sunbeam! was it thus thy beauties were to be cast down? Was it thus thy votaries were to be seduced, and the shades of cold neglect allowed to cloud thy argent field? Thing of light, born of mysterious mist, 'twas thus thy glories were dimmed! Yet, though thou art no more in demand, we hold thee dear in the past as a beautiful and finished creature.

The cry I spoke of sank deep into the hearts of daguerreian artists; *they* could not see the merits of the "*Newcome;*" but at last it had to be resorted to: the public demanded it, and thus the thing of vapours had to give place to the thing of fluids. Unsalutary odours were now introduced into the laboratory, threatening to eclipse all the vapours of the daguerreotype; our garments were spotted and riddled with drops of acid received in making the horrid gun-cotton, and filling our lungs with cough-provoking fumes. We did not relish the process at its beginning; but, when we viewed the snowy gun-cotton dissolving in the laughing ether—then, on the addition of iodide of potassium, the variety of tints the liquid began to assume, from the pale straw colour to the deep blood-red—the called-out-against *collodio-type* began to have some attraction. The performance of the magical feat of pouring the collodion over the plate without spilling a drop, and the no less wizard-like trick (in which we were not always successful) of introducing the plate into a plate pan—for we had no upright baths then—all this done in the dark, with only a screened peep of gas to light us in our manipulations, was no joke. We thought it so different from our former mode of operation that we could quietly (but for the demand) have dispensed with it: eventually it progressed to the utter extinction of the silver plate.

Watching how, step by step, the collodio-type has risen to a state of perfection, one cannot help thinking of the difficulties to be encountered, when, as Mr. Brown has it, photography was in its infancy. Many of the barriers to its progress lay in not being able to procure ready-made material, and in the want of pure chemicals. We had to manufacture or purify to a considerable extent the stuffs we used—prepare the gun cotton, sometimes to find it had been too long subjected to the action of the acids or had been improperly washed, to the certain destruction of our ether, alcohol, and iodide, the exact proportions of which were as yet under debate.

Think not lightly, then, ye modern amateurs and recently-dubbed photographers, of the labours of those who groped through darkness to bring the infant collodio-type to the light, and paved for you, through a chaos of difficulties, a royal road to the camerian art! The chemist, however, began to see that a field for his research and profit was opened up by the new art, and he assiduously went to work, concocting the collodion and chemicals suitable for our use. The optician also brought his experience to bear upon it. The artist, who could not at first regard photography as a high art rival, and shyly stood aside, began to feel its attractions, and was pleased to copy and take hints from it, giving in exchange his skill in the composition of pictures and the due arrangement of light and shade. In fact the art became so enticing, both in a recreative and business light, that a short time beheld numbers totally absorbed in its pursuit, bringing from the sciences and arts new ideas and applications, till, by degrees, photography has acquired a division of labour which has proved a good to all, for now we can procure almost anything we want in a very short space of time.

Thus far it is well: yet there are difficulties lying in our way, and, as we read our photographic journals, one would suppose there was no end to them; yet, thanks to those journals, they have cleared away many impediments, and bid fair to dissipate those which still remain. Among those adverted to by Mr. Brown is the nitrate of silver bath; the difficulty of keeping it right, or, when wrong, how to put it right. Three or four years ago we felt similarly annoyed; but then we only employed one bath, and that bath used for the production of pictures, large and small, in great quantities, without being properly attended to. It would take a fit of bad humour and absolutely refuse to work, or, if it did work at all, gave us pictures thin and meagre, with black spots on different parts of the plate—resisted the developing solution, leaving most unpleasing streaks and dashes over the picture. What was to be done then? We were in a mess ourselves, and customers were troubled by the delay occasioned in forwarding a new bath. Now it is quite obvious that all this resulted from proper care not being taken of the bath in question. Again, if it happened that the new bath would not work (as sometimes it occurs after a new bath is started, unless it has due time to settle), we were fairly nonplussed, and had to work as best we could under the circumstances. We, however, got into the plan of keeping two baths in good working order: we started one, and if it proved good laid it by till the other should show the slightest sign of a break down, which coming we laid it aside, after carefully adding a given quantity of water, which had the effect of throwing down a milky precipitate; this we filtered off, allowing of as much evaporation of alcohol and ether as possible, by using a broad wide funnel and allowing the drop from the point to fall into a deep bottle: this assisted in clearing away the volatile matter in the bath. We then weighed out double as much silver as the quantity of water formerly introduced, shook the bottle violently, and put it carefully by to settle. Very seldom indeed it required further doctoring, unless perhaps a slight precipitate of silver covered the plate, which, upon the addition of a drop or two of acetic acid, disappeared. Thus we have gone through bath after bath, without encountering the many failures complained of when only one bath is used.

A bath can be worked from 20 fluid ounces down to five, and the remaining five mixed up anew without any loss. With regard to collodion, I prefer a middling thick solution. That prepared by Mawson I have worked and do work with successfully, both for positives and negatives: if it be too thin I add a little gun cotton to bring it up to the proper consistency. I do not always go by the exact quantity of iodising solution as given in the formulæ labelled on their bottles, as in occasional samples I find it differs, more especially if long kept. I prefer collodion to be mixed at least one week before using, although I have taken pictures very rapidly by newly-iodised collodion; but the chances of comets and other streaks have to be risked. You cannot always get the same body of collodion, as with one sample you may make pictures which, when dry, look as if they had been varnished, whilst in others the pictures look obscure. I remedy this by always having by me a solution of good gun cotton in pure ether, with about a third of pure alcohol, adding half of this solution to a half of the collodion. A great deal of the success of collodion pictures depends on the developer, and the exact quantity of material used in making the solution. I have been successful with pyrogallic acid with the addition of nitric acid; but it appeared to me to be too slow of development, and to give a slightly brownish tint to the picture. With protosulphate of iron, nitrate of potass, and acetic acid, with a little alcohol, in the usual proportions, I have got good results, the pictures being of a dull white appearance, very suitable for colouring: if too much acid were added a bluish or slightly greenish metallic image was the result. Here I would advise, as I have found it in my own experience, that collodio-type pictures, if they are to be highly coloured and varnished, should be of this particular class, as the silver forming the image is of a soft, spongy, absorbent nature, which the varnish quickly permeates, sinking the colour softly into the picture. I do not think, for durability, however, without being coloured and varnished, they stand the test, in point of permanence, against those bright metallic positives so much resembling daguerrotype, produced by nitrate of baryta in the iron solution, which develops the pictures very slowly, but gives such fine gradation and minutiæ of detail that, to me, gives it a preference over the other developers. I have one picture here, taken about four years ago, which has been exposed in the show cases over and over again, was taken out of the frame and placed in the dark room, became slightly oxidised, and was treated with cyanide solution in the manner we clean off the oxide of daguerreotype plates, and, again mounted: it looks almost as well as when first taken from the bath, but such pictures do not permit of colouring, the metal being so hard as to resist the colour, except the slightest tint, and even refuses to let the varnish sink into them; yet they are pretty, and I think should never be coloured, each touch taking away from the beauty of the photograph.

If the foregoing remarks, loosely thrown together (owing to the short time I had to prepare them), assist to elicit others from the members present, they shall have served my purpose.

ON GOLD AS A PHOTOGRAPHIC AGENT.

By — Davies.

[Read at a Meeting of the Edinburgh Photographic Society, May 1st, 1861.]

At the last meeting I attended my paper was put down for a fortnight later than to-night, and I was rather astonished to find in the report of the last meeting, which I was unable to attend through illness, that it was to be ready to-night. I have tried my utmost, and failed to do what I intended, having been thoroughly incapacitated for literary work, and indeed for almost every other, for nearly a month. I hope, therefore, that you will excuse my shortcomings.

Pure gold is of the specific gravity of 19·5, and its atomic weight or combining equivalent is 197. It is almost invariably found in the metallic state, but occasionally contaminated with silver and copper; and in this state its only photographic use that I know of is that of being combined with the profits of some dealer in cameras, lenses, or photographic materials. I am sure most of you will be too familiar with its use in that direction to need any light that I could throw on the subject. Indeed, I believe it is more extensively used in that way than in any other, especially by amateurs.

Although in the metallic state it is perfectly unoxidisable in atmospheric air, still there are various modes in which it can be made to succumb and unite to the other elements. Thus it can be made to unite with oxygen in two proportions. The suboxide Au 2 O_2, and the sesqui or peroxide called auric acid Au 2 O_3. Again, with ammonia, to form fulminating gold—the ammoniacal oxide—which is occasionally formed in making chloride by the hydrochlorate of ammonia method, which I advise you to avoid. Again, it unites with sulphur in two forms, corresponding with the oxides—the disulphuret Au 2 S_2, and the sesqui sulphurite Au 3 S_3; and with chlorine we have the sub or dichloride, which is quite different from our chloride, being a yellowish non-crystalline body, quite insoluble in water, and totally unfitted for photographic use; while with the addition of one atom more of chlorine, we have the sesqui, per, or terchloride, or, as we call it shortly, chloride of gold, Au. $Cl._3$, the additional atom of chlorine making it a crystalline body in dry air and a moist mass in

ordinary atmospheric air. Thus you have the key to the sealed tubes in which it is usually sold commercially. It has become, with this additional atom, soluble in water, alcohol, and ether; and such an affinity has it for ether that you may extract every particle of it from an aqueous solution by means of ether alone. This etherial solution, by-the-bye, has the quality of gilding bright iron or steel by simple immersion only. It is with this tractable salt that we, as photographers, have mainly to do, as without it we could have no phosphate, citrate, or other of the exquisite and safe toning baths we now use, and would have no resource, save in sulphur—which we have happily been forced to learn, by bitter experience, the uselessness of—and perhaps platinum, which is comparatively powerless, and does not produce the fine tones of gold, besides being very much slower.

If we, as a young and practical society, had followed the natural routine, we should have had a paper on positive printing before one on toning, and it would have saved both you and I some trouble, as I must be allowed to say a few words on that subject before coming to the question of toning, and on gold as the agent.

Whatever may be the mode of producing negatives—whether the Fothergill of Mr. Burns, or the wet collodion of Mr. Nichol—we are all agreed as to the use of the negatives made, viz., to assist in producing good prints; and I am of opinion that the introduction of alkaline gold toning has caused most photographers to be more careful in the production of them, as it is a truth that, while a fair print might be got from a poor negative by the old processes, you cannot get anything like the same kind of quality from the alkaline gold process unless the negative be good, the prints requiring to be fully and deeply printed. I would also say, don't spare the silver. If you buy your paper ready albumenised you may safely calculate that it is salted with at least ten grains of salt to the ounce. I think this too much, and never, when albumenising, use more than from three to five: using ammonium by preference with this quantity, and a fifty to sixty grain bath, you will get as fine prints as with an eighty grain bath and ten grain salting solution.

In reference to the theory of toning by gold, my opinion is that the action of the gold in the bath, in whatever way it may be made, whether by simple chloride, with a dash of alkali, or phosphate, or citrate, is similar to, if not identical with, the action induced by the galvanic battery, and that the gold is deposited on, and partly substituted for, the silver with which the paper was originally covered. Although I have not tested it yet, I feel certain that an appreciable amount of silver could be recovered from old toning baths if they were kept, resulting from the substitution of the gold for the silver previously on the paper.

I may mention here, without in the least attempting to claim any originality in the matter, that with the exception of a short erratic chase after Mr. Sutton's *sel d'or* bath, when using the ammonia nitrate paper, I have never used any other than an alkaline gold bath, which is now a NEW DISCOVERY!! and I believe that many others can say the same. I have now used it fully four years.

From the many forms that adulteration and short weight and measure assume, I hope I shall offend no one by saying that, as usually sold in the shops, you rarely if ever get the full value for your money. Tubes with a warranty of fifteen grains of pure chloride are almost unknown; and it was this, together with not caring "to pay too much for my whistle," that first called my attention to the task of trying whether I could not cheapen its cost to myself. After trying the dissolution of various pieces of metal, from a half-sovereign to some old jewellery, I tried some gold dust in that state of minute subdivision in which it is brushed off the gilding of picture and mirror frames during the process of gilding them. Perhaps my business led me to it; at all events I found that the cheapest and best material for making it. It is usually sold for £3 an ounce instead of £4 for sterling, or £4 to £8 for pure gold (which, by-the-bye, you must use for the hydrochloride of ammonia method of making chloride). It is of fine quality, nearly, if not quite, as fine as sterling; but in that state is only fit for the melting pot or for this purpose. To use it I proceed thus:—I take say seventy grains of this material, which costs 8s. 6d., and which, with the addition of six pennyworth of acid, makes one hundred grains at least of chloride at a cost of not more than about 1½d. The mode of doing it is this:—Take five parts of hydrochloric acid, three of nitric, and one of water. Mix and add the gold. If slow of dissolving, gently heat it, and in two minutes it will be ready for the next step in the process, as you see. It is now, however, impure, from the mixture of silver and copper alloy which has also been dissolved, and there is sure also to be a surplus of acid used; therefore we must get rid of both, which is done by one operation by simply neutralising by carbonate of soda, which changes the silver and copper to carbonate of those metals, and leaves a residue of chloride of sodium in the gold, which is of no consequence to the toning powers of the article. If for immediate use slightly over-neutralise it and filter, and you may use it at once, as I will do: if wanted to be kept in the solid state, the acid is driven off by evaporation and heat; if fluid, by determining your quantities you can, by adding water to make it say one drachm to the ounce, keep it in that state. It is best to be kept in the dark.

I have purposely omitted giving strict rules as to quantities, as you may vary within very wide limits; and would only advise, as you are never sure of the commercial strength of your acids, to always have a full allowance of hydrochloric acid, as it is the free chlorine which determines the dissolution of the metal.

[The writer then proceeded to dissolve a quantity of the gold, from which, in a few minutes, he toned several albumenised prints. After which he stated that, had time permitted, he should have shown the other methods of using the material made, including the citrate of gold process—which is very beautiful and effective, but very wasteful of the chemicals, as they do not remain in action for any time—and also the chrysotype, a process which depends for its results on the reduction of a persalt of iron into a protosalt. Mr. Davies hoped that time would be found for that some other evening.]

THE SILVER AND ACETATE OF LEAD BATH.*

By M. Mc-A. GAUDIN.

ACETATE of lead behaves with nitrate of silver differently from other soluble acetates. Opposed to the law of Bertholet, insoluble acetate of silver is not formed by an exchange of acids: this is the reason why we can add acetate of lead in all proportions to the nitrate bath.

I have made an attempt to explain the absence of a precipitate being formed when the two salts are mixed together; and I have thought that if the precipitate of acetate of silver does not present itself, it may be that it does not remain persistent, if formed—being taken up through the solvent action of acetate of lead on acetate of silver. To ascertain this point I operated by synthesis. To a concentrated solution of acetate of lead I added acetate of silver, washed, and dried; I agitated the mixture and filtered through paper. The clear liquid applied to paper became blackened by light, as if I had treated it with nitrate of silver. Thus, without doubt, acetate of silver *is soluble* in acetate of lead.

It is a point that it is possible to employ this new bath in place of nitrate of silver. This dissolves little iodide of silver, but the addition of an acid—necessary when pictures are to be developed with salts of iron—always causes a precipitate of part of the acetate of silver.

The bath which I had prepared was charged with a little acetate of silver, and the collodion assumed its opaline aspect when removed as a sensitive film, proving a very slight impregnation of acetate of silver; but I have never made my preparation otherwise than cold, not aiming at charging it with much silver.

My first experiment should have been tried at boiling point, but I purpose stating on a future occasion whether acetate of lead, saturated when warm with acetate of silver, is capable of giving collodion proofs comparable in all respects with those produced by the ordinary baths.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held at eight o'clock on Tuesday evening, the 7th instant, at King's College,—Henry White, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed and declared duly elected members of the Society:—Captain W. Osborne, Edward Hailston, Esq., and Colonel Maitland.

Dr. DIAMOND announced the receipt of a cheque for £100, sent by the Honorary Secretary of the Bengal Photographic Society, in aid of the fund being raised for the support of the widow and orphans of the late Mr. Archer.

Mr. THOMAS read a paper *On How to Prevent Stains and Streaks in the Negative*,† for which he received the thanks of the meeting.

Mr. BEDFORD had worked with so much light in the yellow room, and had obtained such satisfactory results, that he could scarcely ascribe

* *La Lumiere.*

† Mr. Thomas's paper is postponed till our next number.

these streaks to the presence of too much light, or to diffused light. Of course it was very essential to take every possible precaution against having too much light. Had Mr. Thomas ever developed these plates without exposing them, and did they then present the streaks as in the ordinarily exposed finished picture? Some of the brightest pictures he had ever taken were in a room at Marlborough House, with a southern aspect, where the window was eight feet by five feet, covered with only two thicknesses of yellow calico. There was such an abundance of light in the room that he could see to read the smallest print in any of the corners; but, notwithstanding that, his pictures were quite clear, and in the transparent parts were quite free from any symptoms of streaks or fogging. He had himself tried, lately, to find out the cause of these streaks. He had tried putting on an additional thickness or two of calico over the window, but he did not find that the difficulty was obviated. Of course if there were too much light fogging would occur, and people very often spoilt their pictures by working with too much light in the yellow room.

Mr. Vernon Heath considered it was only due to Mr. Thomas that he should mention his experience on the subject during the last few weeks. He informed Mr. Thomas a short time ago that stains occurred on the plates he prepared in his glass house, in London, and Mr. Thomas very kindly volunteered to point out the cause of them. Mr. Thomas attributed the stains to the presence of too much light in his yellow room, the light in which was regulated with the ordinary care photographers take; but he must say that since Mr. Thomas had induced him to alter the condition of the light by putting additional yellow tammy the stains had entirely disappeared. The moment he removed the tammy the stains returned, and so, although the dulness of the light was very inconvenient, he was compelled to put up with it. He now obtained very brilliant negatives—so brilliant, indeed, that, when looking at them by reflected light, they presented all the appearance of positives, with all the characters Mr. Thomas had indicated in his paper; and for printing there was no comparison to be made between the prints he obtained before the alteration and those taken from the negatives he had since produced. The peculiarity of the streak in his negative was that it commenced at the top and ran downward.

The Chairman asked why, if too much light were the cause of the marks, general fogging was not produced, instead of the action being confined to thin lines?

Mr. Malone agreed with Mr. Thomas that great care should be taken with regard to the exclusion of light. He had been unfortunate enough to have worked in a country-house, where there was nothing beyond a small square of yellow calico, except some old carpets placed over a large window, to exclude the light. His negatives were covered with spots, comets, streaks, &c., and he came to the conclusion that they were owing to the presence of photogenic light in the room in injurious quantities. As to how it acted, and as to how photographers got into the difficulty, he would point out. People generally got into these kind of difficulties by not adhering to acknowledged principles in their work. Mr. Crookes, in fitting up his dark room, put a sheet of yellow glass in the window shutter, and in order to ascertain whether the glass was properly covered with the silicate of silver—to which the yellow colour is due—he put a sensitised plate behind the sheet of yellow glass, and left it there for a considerable time with the light of the sun pouring directly upon it, and then proceeded to develop it. He found it quite clear, which justified him in concluding that the photogenic light was completely excluded. If the yellow or rather orange glass were not sufficient, or was speckled with little holes that admitted rays of white light, two sheets of glass might be used, as it was not probable that the holes in one sheet would be coincident with those in the other sheet, or else a mixture of yellow glass and yellow calico, or tammy would answer the purpose. In fitting up the London Institution they had not been quite so successful as they might have wished, as the glazier had taken upon himself to use some panes of a lighter coloured glass than was selected. However, the light was not admitted to an injurious extent, as far as he had yet noticed. It must be recollected that, even when the room appeared almost dark, photogenic rays might obtain access through cracks and crevices to an injurious extent. If collodion were poured upon a dirty plate a chemical action would take place; but unless a certain amount of photogenic rays were present no ill effect would be produced. A slight amount of photogenic light, however, would cause a chemical action to be set up, and stains, &c., would be the result. He thought that the streaks were formed by the solution when running down the plate, on being taken out of the bath, forming ridges in the direction of the draining, and the fluid being denser than the air, and not so dense as the glass, any white light in the room would be concentrated by refraction, after the manner of a lenticular body, and lines would be formed on the plate, corresponding with the direction of the ridges. He might state that he always covered his bath over with black velvet whilst a plate was being exposed, so as to protect it from any extraneous light.

Mr. S. Davis thought all streaks and spots were not to be attributed exclusively to the presence of actinic rays of light that had obtained access to the dark room. He had found when preparing dry plates that streaks which appeared upon a plate when dipped in one bath disappeared when dipped in another, the same collodion being used. In one instance he had used a new bath, and in the second he had used an old one. The old one, having an excess of ether, required a considerable amount of time before the nitrate of silver would flow evenly over the plate, and streaks were produced. He generally used a sheet of yellow glass in combination with one of orange, covered over with a sheet of orange paper. He recommended that a regulator of the light should be used, especially when preparing dry plates, as sometimes the light was more brilliant than at other times.

Mr. Malone thought that the use of a second bath, rather old and slightly acid, would tend to remove the streaks which had occurred when the plate, in a high state of sensibility, was taken out of the first bath; and even redipping the plate in nitrate of silver might have a beneficial effect in removing stains, by destroying the *excessive* sensibility of the film. Was there any reason to suppose that there was an excess of ether in the new bath when these streaks occurred?

Mr. Eliot had noticed that lines would occur even in a new bath when plates were kept out of the solution for any length of time during the operation of sensitising. Lines were produced in that case even where the plate was not exposed to light. If the collodion contained plenty of alcohol there would be less likelihood of the stains being produced.

The Chairman inquired what effect would be produced if a candle were in the room when the plate was being prepared?

Mr. Thomas said that the effect would vary according to the distance of the candle from the plate and the means of protection employed, as it was quite possible to print by either a strong candle or gas light. If their plates were prepared in a perfectly dark room, they would produce negatives far surpassing any they had obtained before. Mr. Bedford had stated that he worked, when at Marlborough House, with a great deal of light in the operating room. Now, he knew how easy it was to come to an erroneous conclusion upon the subject—in fact, one day's experience was exactly contrary to that of another. A great deal depended upon the character of the light and the relative position of the sun to the window of the room at the time of operating. That was the reason why he advised them to try their test-plate when the light was strongest—on the brightest day they could select. With regard to those negatives taken by Mr. Bedford at Marlborough House, he was almost sure that they had been taken some seven years ago. [Mr. Bedford acquiesced in this opinion.] Now, seven years ago they knew very little of the character or quality of nitrate of silver used for the silver bath. At that time, if the crystals looked pretty and were large they were considered pure; whereas, in fact, they contained a very sensible quantity of nitric acid. In his paper he had referred to the use of a neutral bath in making his experiments, which would, of course, be more sensitive than an acid one. If they were to take some of the fine large crystals of nitrate of silver and break them, a piece of litmus paper would indicate that a large quantity of acid was entangled in the pores of the crystal. That would explain why, seven or eight years ago, they could work in rooms comparatively light, the acidity of the crystals preventing excessive sensibility in the film. Not only was the nitrate of silver very acid, but the collodion was iodised with potassium alone, very little cadmium being used at that time; and an explosive pyroxyline, which decomposed very readily, was employed in the manufacture of the collodion, which also decomposed very soon, and was therefore not so sensitive to the action of light (especially if it were at all yellow) as the collodions made at the present day. At the present time, however, the proportions were so exact, and the chemicals were so delicate and sensitive, that it was quite impossible to work in the presence of any material quantity of light. In some instances two, or even four, thicknesses of tammy were scarcely sufficient to exclude the light. The Chairman had asked why, instead of lines, the presence of light did not produce general fogging. The reason of that was, that when the plate was first taken out of the bath, it was in a streaky, liny condition, and in that state the diffused light, no doubt, as Mr. Malone had explained, was concentrated by the lines of the solution, which left a stain beneath them. In fact, they could be produced at will, by admitting a little light upon a plate freshly taken out of the bath. Some gentleman had remarked that orange glass alone might be used with safety. He could not allow that expression of opinion to pass without contradicting it in the strongest manner. He did not think any orange or yellow glass *per se* was sufficient under all circumstances to prevent the action of light in the developing room. Mr. Davis had referred exclusively to the preparation of dry plates, upon which subject he himself had not had much experience. He did not like dry plates, and he wished all dry-plate processes at the bottom of the sea, as he believed that they had to a very great extent put out of sight and out of mind a very much more perfect and more beautiful dry process, namely, the Talbotype paper process. In his opinion the results obtained seven or eight years ago by the calotype process upon paper were far superior to anything that had been done by the dry-plate processes. With reference to the question put by the Chairman, he thought it was very difficult to define which marks were produced by light and which were produced by fogging. He would content himself by saying that, if they found that their negatives had a dull dark surface, there could scarcely be any doubt about there being too much light in the dark room, and that very likely when the negative was developed streaks would be perceived.

Mr. Malone protested against the statement made by Mr. Thomas that a single sheet of yellow or deep orange glass would not sufficiently exclude the photogenic rays. Certainly Mr. Crookes had made his experiment several years ago; but he was too good a chemist to have used nitrate of silver containing nitric acid in his test experiments.

Mr. THOMAS would be greatly delighted if anybody would discover a yellow glass that would completely exclude the photogenic rays; but, certainly, the glass that was sold at the present time was not suitable for the purpose.

Mr. MALONE said Mr. Williams suggested to him that if the glass were made of the "pot metal," instead of the "flashed glass," it would answer much better.

The CHAIRMAN thought, so far as his experience went, that the orange glass was quite sufficient when aided by a sheet of ground glass.

Mr. THOMAS said ground glass made all the difference, and was a great improvement.

Dr. DIAMOND also thought, from the experience he had had with Archer's camera, in which yellow glass was inserted, that it sufficiently excluded the light. He did not think Mr. Malone's plan of covering the bath with black velvet good, as it was very likely to harbour dust, which was then shaken on to the surface of the bath, and thus streaks, comets, &c., would be produced. He thought a cover made of deal or cardboard was much better for the purpose of excluding stray white light or dust.

Mr. HARVEY read a paper, or rather advertisement, *On Old and New Inventions for Preserving Pictorial Works of Art.* This gentleman would have attained his end better by simply placing his ingeniously-contrived portfolios before the members, and pointing out their peculiarity of construction, which would not have taken more than five minutes, instead of occupying from half to three quarters of an hour of valuable time, which every person present hoped would have been given to the discussion of an important subject. It is to be hoped that the officers of the society will never again permit such an infliction. The advertising element was *too* palpable throughout this so-called "paper."

Mr. VERNON HEATH gave notice that, at their next meeting, he should ask some questions with respect to the position photographers were to occupy in the Exhibition of 1862. The session ought not to be allowed to pass over without some observations being made upon so interesting a point.

Dr. DIAMOND said the Lord Chief Baron informed him, last Sunday week, that he had received a communication from Her Majesty's Commissioners respecting the position photographs were to occupy in the forthcoming Exhibition, and requesting the Photographic Society to appoint six or eight members competent to advise them on the course they should pursue in reference to photography. The Lord Chief Baron at once requested a special meeting of the Council, who decided unanimously that, previously to their taking any steps in the matter, photography must be placed in its right position, in connexion with the art section of the Exhibition, and that it should not be treated as a mere mechanical appliance. They were now awaiting the result of the communication to the Commissioners of that decision.

Mr. VERNON HEATH said that, if photography were so purely a mechanical art, how was it that the pictures by Bedford, Fenton, Mudd, and others, were as easily distinguished by their individual characteristics as were the pictures hanging on the walls of the Royal Academy? Surely that distinctive character could not entirely be due to speciality of process. If his conviction were correct, surely it could not be right to endeavour to throw photographers back to the position they originally held in public estimation as mere mechanical operators, when they had been struggling so hard to raise their art to the excellence it had at present obtained.

Mr. SHADBOLT was glad to find the Society was determined to place photography on its proper footing in relation to art at the forthcoming Exhibition. He wished to suggest to the Society that if they found there was no intention of placing photography on the same footing with other arts' subjects, they should take the matter into their own hands, by getting up a special photographic exhibition in 1862, totally distinct from the Great Exhibition. Another matter which he wished to suggest was one that had appeared in THE BRITISH JOURNAL OF PHOTOGRAPHY, namely, that it would be much to the advantage of photography if the pictures of the members of each society could be arranged in groups, so that the members of the various photographic societies would have a double motive for emulation. He would not propose any resolution on the subject, but would merely suggest it to the Council for consideration.

Mr. MALONE said he had striven personally, at the time of the Great Exhibition of 1851, to have photography placed on a proper footing in connexion with art. On that occasion some photographs were sent in by an eminent photographer, some of which were coloured and others were not, and by his management they were placed in the fine art department, whilst those sent in by himself (Mr. Malone) and others were put up in the gallery devoted to photographic apparatus. Remonstrance was made on the subject to one of the sub-chiefs of the Exhibition, who replied that the gentleman whose pictures were so distinguished was a noisy, troublesome fellow, and that it would be better to leave his pictures where they were and to leave theirs in the gallery. He felt that the same influence was at work again, and that they must do something to prevent photography being treated in 1862 as it was in 1851.

The CHAIRMAN said there could be no doubt but that the position assigned to photographic art in the Exhibition of 1862 was highly derogatory to them. However the Lord Chief Baron had written to Earl Granville on the subject, and he trusted that something would be done in the matter to place them right in public estimation. Photography was the only result of chemical invention that was classed among the mechanical arts.

Mr. S. DAVIS suggested that no photographs that had been touched up by the pencil, brush, or other means should be admitted into the Exhibition as specimens of pure photography, so that the public might be convinced what the art *per se* was really capable of producing.

Mr. V. HEATH announced that at the next meeting, on the first Tuesday in June, he would exhibit Professor Way's electric lamp in operation, and its application to photography.

The proceedings terminated with the usual vote of thanks to the Chairman.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on the 1st instant, at the Philosophical Society's Rooms,—Mr. Joseph Sidebotham in the chair.

Some donations to the portfolio, which possessed more than usual interest and beauty, were laid on the table. They included two copies of engravings, *Check* and *Checkmate*, by Mr. Petschler; and these, as well as two others, landscapes (size, 9 × 7), afford ample illustration of the capabilities of the process followed by that gentleman. Mr. Young also presented some prints from negatives (10 × 8) of landscapes by what may be called Mr. Parry's hot water process. These pictures are almost all that can be desired, and exhibit none of that violent contrast of shade and absence of half-tone which has been erroneously attributed to this process. Mr. Wardley also presented a view of *Dunham Old Mill*, taken on the 24th of December last—a day to be remembered in all England for its intense cold. The beautiful frost looks well in this picture. Mr. Sidebotham produced a copy of an old caricature depicting a ludicrous and not very reverent incident in the clerical life of the late Rev. Joshua Brooks, coloured after the original.

The usual vote of thanks was unanimously accorded to the donors.

Mr. COTTAM, who, in the unavoidable absence of the Secretary, had undertaken his duties, said the business of the meeting would be to resume the discussion on stops, introduced by the Chairman at a former meeting, and continued at the last one.

Mr. BROTHERS, who had continued his experiments, exhibited some more specimens, showing chiefly the different degrees of intensity produced by the same simultaneous exposure with different stops, as suggested by Mr. Sidebotham, and said that there was no advantage derivable from the use of any but circular stops, as other stops drew out and distorted the lines in the direction of the stop.

The CHAIRMAN thought that such distortion was infinitely preferable to a distortion in every direction, as must be found to be the case with those who used five-inch lenses for portraiture. He had not brought forward his theory before he was as satisfied of its truth as of that of an axiom of Euclid. He thought Mr. Brothers' experiments should have been made on a smaller bust, and read a letter in the *Photographic News*, from Mr. Lake Price, in support of his theory, in reply to Mr. Maginn, who had discovered the same thing since the last meeting.

Mr. BROTHERS said he had nothing to allege against the theory, but thought the distortion was not visible to any great extent in portraits.

Mr. Wardley and Mr. Parry took some part in the discussion.

Mr. NOTON produced four pictures, taken with a longitudinal, an upright, a triangular, and a circular aperture. The preference appeared to be given to the one with the perpendicular stop, though the triangular one would probably have given the best effect had the opening not extended too much into the margin of the lens. The object was a perpendicular gothic monument to the late Joseph Brotherton. He said his object in experimenting in that direction was to find a means to shut off any superfluous sky, which was sometimes very desirable.

The CHAIRMAN said that the contracted oblong stops were of course not applicable to landscapes, and remarked that any credit in the matter was due to Mr. Noton, who had introduced the subject some time ago.

A discussion ensued upon the pictures on the table, by Messrs. Petschler and Mann's process, which many who had used the old Taupenôt process agreed were fully equal to any that could be produced by it.

Mr. PETSCHLER promised, on being requested by the Chairman, to develop one of his plates at the next meeting. He used, he said, three grains pyrogallic acid to the ounce, and two or three minims of a ten-grain solution of nitrate of silver. When the details began to appear he reduced the strength of the pyrogallic acid, and added more silver. Five to ten minutes sufficed to develop a picture 9 × 7. The copies of engravings had had three-quarters of an hour's exposure with a half-inch stop.

Mr. PARRY explained that, in his process, a neutral silver bath caused fogging, and this effect had made Dr. Ryley condemn the process—probably without knowing the cause. He (Mr. Parry) found that he got the best results from an acid bath.

The CHAIRMAN said he should like to see a large plate prepared, as he had had some difficulties with the albumen in the hot water, though he had succeeded with stereoscopic plates.

Mr. YOUNG promised to prepare a plate at the next meeting.

Mr. PARRY exhibited some stereoscopic transparencies, which were much admired, and

Mr. OFFER proved the keeping properties of the process by showing some beautiful transparencies on plates prepared some three months ago.

Mr. HOOPER described a new box for keeping prepared plates which he had seen. Each pair of plates were placed face to face in a frame of wood

composed of two thin frames with a strip of India-rubber between, which projected about one-eighth of an inch between the plates all round. Four springs at the corners press the plates together, and the sensitive sides of the plates are in a manner hermetically sealed. A number of these pairs were then placed together in a grooved box.

The Chairman reported very favourably as to the copying capabilities of one of Dallmeyer's lenses which he had been trying: the caricature on the table was a specimen. He also begged an inspection of Mr. Noton's very ingenious pneumatic plate-holder, one of which was on the table.

A conversation ensued about the alleged discovery by Mr. Fry, &c., and also as to the propriety of adding resin to collodion. Some remarks were also made as to the appearance of rusty patches on albumenised paper toned by the alkaline process, the cause of which seemed doubtful. The attention of the manufacturers to the matter was desirable.

A Member remarked that there was a striking instance of a re-discovery in The British Journal of Photography for that day, namely, Mr. Skaife's method of obtaining enlarged portraits—a plan which he knew had been used by the late Mr. Handley, an artist, of Manchester.

It was subsequently announced by the Chairman that the Committee had made arrangements with the General Committee for a Photographic Exhibition, to be held on the occasion of the visit of the British Association, in August next. A sum of money had been granted for that purpose. One of the best rooms in the Royal Institution had been obtained, and, with the time and money they had at command, he did not doubt that they would be able to get up an Exhibition superior to anything of the kind which had preceded it. He suggested to the members the desirability of their taking improved views of places of interest in the neighbourhood.

The Chairman was complimented in the usual manner, and the meeting was brought to a close.

[We notice that this Society continues its meetings through the summer, and this remark will correct an accidental omission in our *Almanac*. The next meeting is fixed for the 5th June.—Ed.]

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held at the Odd Fellows' Hall, Temple Street, on Tuesday, the 30th ult ,—W. B. Osborne, Esq., Vice-President, in the chair. There were also present Jno. Anthony, Esq., M.D., Messrs. C. L. Haines (Vice-President), Hart, Plante, Turner, Burr, Johnstone, and Brown (Hon. Secretary), &c., &c.

The minutes of the last meeting were read and confirmed on the motion of Mr. Hart, seconded by Mr. Haines.

Mr. W. B. Osborne exhibited four large pictures by the waxed-paper process, from Mr. Robertson, Manchester; Dr. Anthony, portraits, by Mayall, of the Prince Consort, Prince of Wales, Prince Alfred, and the Earl of Derby, as also a number of untouched prints from Mr. T. R. Williams, of Regent Street, and several photographic reproductions of engravings; and the Hon. Secretary, the pictures received from Mr. Mudd, of Manchester, including the celebrated *Coniston Falls*.

The whole of the above were minutely criticised, their general artistic beauty eliciting much admiration, and pronounced to be in every respect first-class photographs.

Dr. Anthony said that the portraits which he exhibited, by Mayall, had been taken by one of Voigtländer's four-inch long-focus lenses, and developed in the ordinary manner. They each possessed a wonderful roundness—that of the Prince of Wales remarkably so—together with great depth of focus, and also showed very clean and careful manipulation. He called particular attention to a reproduction of an engraving, taken by the orthoscopic lens of Voigtländer: this print was of the most satisfactory character, and the light equally distributed over every part of the picture.

The Honorary Secretary stated his conviction that if opportunities, such as the present, of examining the productions of our best photographers was afforded to the different provincial societies, it would tend in a great measure to foster and extend the art by inducing a feeling of emulation, and, at the same time, give them an impetus, by rendering the meetings more interesting; and he felt bound to express his thanks to Mr. Mudd, particularly, for the manner in which he had responded to his invitation to forward a copy of his *Coniston Falls* for the inspection of the members.

Mr. Turner produced three portraits, the negatives of which he stated were taken by one of Lerebour's small lenses. He stated that he found the Lerebour lens to work better than any other he could obtain, as it would cover a large picture equally with a smaller one without any distortion or weakness towards the edges.

The Chairman said that, in the paper which Dr. Anthony had favoured them by reading at their last meeting, he had remarked that a stop placed in front of a lens caused the aberration to be of such a nature that straight parallel lines were rendered as curved towards each other, and produced the so-called "barrel" shape; while, if the stop were placed behind the lens, the rays crossed after passing through, and produced an aberration in an opposite direction called "pin-cushion," the lines being bowed from each other. He should like to know how the Doctor proposed to remedy this?

Dr. Anthony said that Dallmeyer's triplet lens was constructed with a negative lens between the others, for the purpose of avoiding both the "pin-cushion" and "barrel" distortions; but, to reduce the distortion to a minimum in a single lens, the object was to cause the eccentric pencils to fall upon the circumference, instead of the direct or central pencils, never forgetting that in placing the stop, and regulating the aperture of that stop, the photographer had to deal with a cone of light and not with parallel rays.

The Chairman said that many opticians made the stops in their lenses immoveable. He had himself a landscape lens in which the stop was fixed.

Dr. Anthony said he had, a few days ago, been speaking on that subject with Mr. Ackland, who acknowledged to him that in every case the stop ought to be moveable. Makers, however, placed the stop in what they thought the best average position; as, if moveable, amateurs would be almost certain to place them in the worst position possible, and then write angry letters to say that the lenses sold to them would not work. He believed that for those who wished to work with care, and who had a knowledge of the subject, the stop ought to be moveable, both in landscape and portrait lenses. Since the meeting of March 26th, he (Dr. Anthony), with the assistance of Mr. Brown (the Honorary Secretary of the Society), had made a series of experiments for the purpose of testing the lenses of different makers, the negatives of which were produced, as he thought they would be more satisfactory evidence than the prints from them of the working of the lenses. These negatives being all taken on the same day, with the same chemicals, and with the camera in the same position, were considered to be a very fair comparison. His house, an old-fashioned residence, broken up by gables, offered an excellent object, not only from the large number of planes it presented, but also from the position of his vinery, the latter of which was about central between the house and the camera. The point of view selected was some seventy feet distant from the main buildings, and from this place the whole of the pictures were taken. Their chief object had been to see how far they could get the vinery and house into focus at the same time. The first was taken by Dallmeyer's triplet, eighteen-inch focus, exposure thirty seconds, without sun. This plate gave an excellent definition of the image up to the extreme edges, and was especially remarkable for the absence of all distortion in the perpendicular lines, so fruitful a source of annoyance in architectural subjects generally. The second, by a Petzval lens, focal length twelve inches, exposure twenty seconds, the sun being out bright, gave a definition of the *central* portion equal to the triplet, but with a tendency to *curvature* in the outer lines. The third, by Voigtländer's single lens, seventeen inches focal length, was exposed, in sunshine, sixty seconds, producing a sharp clear picture in the centre, but falling off materially towards the edges. The fourth was from a Grubb's four-inch aplanatic lens, twelve-inch focus, time of exposure, with sun, ten seconds, which gave a very much diminished image, but included, of course, a much *larger angle* than any of the preceding ones: the definition up to the edges of the plate was good, but a slight curvature was observable. The fifth, was by a Hermagis' portrait combination: this picture was an instantaneous one, with sun, and showed the powers of the lens to be very great, defining with equal clearness a figure against the vinery, thirty-five feet at least from the camera, and buildings at more than double that distance; the outer edges of the plate were not so clearly defined as could be wished, but the lens was evidently overtasked. The sixth, a portrait from Dallmeyer's triplet, with the central or negative combination removed, was exposed in the open air four seconds; but, being taken towards evening, shows a falling off in the actinic power of the light, and at the same time shows also that the triplet is scarcely available for portrait purposes, and *ought not* to be so applied except under extraordinary circumstances. The various negatives were separately and critically examined with much interest, and there seemed an unanimous opinion that Dallmeyer's triplet, from its rendering the lines of architectural subjects, especially, perfectly true and perpendicular and entirely free from distortion, was far superior to either of the others. Although the specimen produced did not show so large an amount of illumination as the others gave, still the detail was equally sharp, and as clearly defined at the edges as the centre.

Mr. Plante asked what form of lens Dr. Anthony thought best suited for enlarging purposes?

Dr. Anthony stated that for enlarging negatives he had never met with any single lens that gave him perfect satisfaction. In a negative of stereoscopic size there was often a great deal of beautiful detail which rendered it very desirable for taking an enlarged picture; but neither Voigtländer's, Ross's, or Dallmeyer's lenses would bring out the detail with the distinctness that he desired, for directly the copy passed the size of the original, it began to fall off most fearfully about the edges. For copying such pictures it was better, instead of trying to do too much at once, to take a positive only a little larger than the original negative, and then again copying that, and so on for several times. By so doing they would get a negative that would print beautifully and show no distortion. Instead of using a single lens in such cases he used a portrait combination, with the stop placed close down before the front lens: by that means the size of the picture was limited, but it was made particularly soft.

Mr. Turner said that would make it like the Lerebour lens, in which the stop was always before the front lens.

Dr. Anthony said that placing a stop in front of a portrait combination, though it had been the custom, was about the worst possible position; because, though a stop in front produced a better definition at the sides of the picture, and so was useful for taking groups, and copying from a plane surface, yet the field was found to be much diminished; the time of exposure to be nearly, if not quite double, that with a *central* stop; and, as Lake Price had correctly stated in his *Manual of Photographic Manipulation*, "the stop in front of the lens gives a *flatter* picture, but placed between gives a larger picture, with more depth of focus in the centre." A smaller stop does not always improve the definition, and beyond a certain point would rather tend to injure it.

Mr. Turner stated that he found the Lerebour arrangement to work very well in taking portraits, and especially if taking a group.

Dr. Anthony: As I before said, for groups the stop would be better in front, as it thereby corrects in some measure the curvature of the field, but at the expense of a diminution in size.

Mr. Johnstone said he always worked with the stop in front, and always had done so.

Mr. Turner did not think Jamin's lens equal to Lerebour's, and found it wanting in depth.

Dr. Anthony: Mr. Williams, some of whose prints you have this evening seen, works, I believe, with a five-inch Jamin lens — with what success you have had evidence.

Mr. Brown asked if any gentleman present had tested Derogy's lens? From inquiries he had made he found that the Messrs. Burton, of Leicester, who had lately opened an establishment in the town, used one; but from the short notice he had given them, they had not been able to supply him with either a negative or untouched print to lay before the meeting.

A conversation ensued upon this subject, the conclusion being that it was not equal to those of some other makers, as, while the centre of a picture was very good, there was a large amount of distortion at the extremities of the plate when it was as large as the lens was supposed to cover, and the lens was also slow in its operation.

The panoramic lens of Sutton was then considered; but, as no specimen of its performance was produced, and the members knew little of its working, they could not arrive at any conclusion; at the same time great hopes were entertained of it.

On the subject of Grubb's lenses, Dr. Anthony stated that he had found Grubb's landscape lens to take in a very much larger angle than any other—indeed, that quality might be seen in the very fine photograph on waxed-paper (Conway Castle) sent for exhibition by Mr. Robertson, of Manchester; but, at the same time, he must say that with a test he was in the habit of using, viz., some fine wire lattice in a dairy window, he could not get as satisfactory a definition with a Grubb as with his other lenses.

The Honorary Secretary (Mr. Brown) said that at their last meeting a suggestion had been thrown out as to whether or not it would be possible to institute a lens committee in connexion with their Society. He believed that, if the question of the capabilities of the various lenses in the market could be fairly decided, it would prevent a large amount of annoyance, to amateurs especially, as well as stir up the makers to produce a better average quality of lens than many were in the habit of doing. As that seemed a favourable opportunity, he asked would it be worth their while to consider that subject then?

Dr. Anthony said the question had been mooted in the London Society again and again, but there had always been the difficulty that the makers would, doubtless, be very willing to prepare lenses for the purpose, but such would not be a fair test of the quality usually sold. It would be necessary to go and purchase a lens without saying it was for the purpose of testing it, and, after trying, to report upon it. But if a lens committee could be instituted, it would, doubtless, bring the best makers into competition, and thus conduce to the advancement of the interests of the science.

After some conversation, and as there seemed so many difficulties in the way of successfully carrying out such an object, the subject was allowed to drop for the present, and the business of the meeting was brought to a close by votes of thanks to Dr. Anthony, for his kindness in coming among them to take part in the discussion, and to the gentlemen who had so kindly forwarded the prints for the examination of the members.

Dr. Anthony briefly replied, and presented, for the album of the Society, five pictures of his production, including a very beautiful landscape with cattle.

The meeting was then adjourned to the 28th inst.

BRADFORD PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Wednesday, the 1st instant,—Dr. R. Parkinson in the chair.

After the minutes of last meeting had been confirmed and passed, the President called upon the Lens Committee to give a final report on the instantaneous lens, by Ross.

A Member of the Lens Committee: On behalf of the committee, I am desired to state that every available experiment has been made on the stereoscopic lens, by Ross, to justify us in giving a decisive report; and we are of opinion that the lens is instantaneous for portraiture, full opening and in a moderate light; but for stereoscopic views, with stop, it is no better (if as good) than the single stereoscopic lens of the same maker.

A Member: I have tried the lens several times, and can corroborate the statement made by the committee.

Mr. Harland proposed that the report be received, which was seconded by Mr. Burrow, and carried unanimously.

It was resolved that the lens should be sold at the next meeting.

Mr. Beldon then read a paper

On the Fothergill Process.

So much has been said about this process—for and against it—that one may safely say it is the bone of contention between all dry-process workers. In my opinion I consider it to be, for stereoscopic plates, the most certain of all dry processes which I have tried; and I may say that I have worked nearly all the dry processes that have been published, and some that have never appeared in print. I have obtained, on the average, very good plates by this process, some of which I may have spoiled with under-exposure or over-developing. Those which I consider the best are rather over-exposed, and give, to my liking, the softest and most harmonious pictures.

I will now give you my method of working, premising that there is in it nothing very startling or original.

Clean the plate well. There are so many ways of doing this that it would be foolish of me confining you to one particular method: so long as your plate is clean, that is sufficient. After cleaning, let your plate be throughly dry before commencing the next operation, which is to coat with a suitable collodion. I find half Keene's and half old collodion to answer very well. Now immerse with one downward motion in the bath. I prefer the bath to be forty grains nitrate of silver to the ounce of water, and made acid. When the plate is removed from the bath, and shows no signs of wrinkles, proceed to the next operation. This part of the process has caused a great amount of discussion, and, whatever the thorough washers may say, I prefer the certain quantity of washing. I take the plate from the bath, let it drain a few seconds, wipe the back with a piece of clean tissue paper, put it on to a clean plate-holder, and then pour on at one corner as lightly as possible four drachms of distilled water: this is made to flow up and down the plate for forty seconds. Work the water well up to the edges: if not, you will certainly have stains on the plate. I know that to wash a plate in this manner is rather difficult, and you may spill some of the water. Should you do so, that plate would be liable to stains and marblings, unless the following precautions be taken:—Continue washing with what water you have on the plate forty seconds longer. You may, in washing, let some of the water fall with a splash upon the plate: this will produce an insensitive patch. I repeat, pour on the water gently. Now, put your plate on to another plate-holder, and pour on to the edge which you intend to be the sky two drachms of the following solution:—

White of egg	1 ounce.
Distilled water	1½ „
Ammonia	10 drops.

Well beat, up to a froth, and let it flow across the plate in one wave, then back again and so on for a few times; pour off; drain a little; wipe the back of the plate; put it into a dish; shake and wash the plate as you like with two changes of water, finishing with distilled water.

I prefer albumen which smells very bad; in fact, some of my best negatives were prepared with very old albumen. I can give you no chemical reason for this preference. I must say I understand very little of photographic chemistry.

The manner in which I proceed after washing off the albumen is as follows:—I take the plate, and rear it on one corner to drain. I use little pads of blotting paper for the plates to rest upon. When I have done another plate I remove the first one into a drying box.

If you do not think it out of place I will describe the arrangement of this box. The box is made of deal, and the inside I have lined with strong brown paper. Across the box there is a piece of deal, and into this are inserted, at convenient distances, glass rods. The box is light-proof. I put in the bottom of the box some bits of ribbed glass.

You may let your plates dry spontaneously, or you can finish them off by artificial heat, by inserting in the box a large bottle of hot water. I prefer the latter method. When the plates are dry I put them in tin boxes, which I find to be cheaper and better than wood.

Now then comes the photographer's anxiety about the weather of to-morrow. On the evening preceding his journey he scans the heavens and looks around for signs which promise him fine weather. The indications being satisfactory, he goes to bed and dreams of leaping cascades, fearful avalanches, over-hanging rocks, old abbeys, castles, and of other things which exist only in dreams—never in reality. Amongst other things, he may dream of falling into the strid, and battling with the watery element, just as he is sinking for the last time, to be rescued by ————; but he is suddenly roused by a shrill voice, calling—"Six o'clock!" He rises—goes on his journey—returns, and, although weary with walking and riding, commences to develop his plates with the greatest eagerness.

I develop in the following manner, and he may do the same:—I take the exposed plate and put it into a dish of distilled water, so as to moisten

the film. In about a minute take out the plate, drain, and pour over it for a few times two drachms of the following developer:—

Pyrogallic acid	24 grains.
Citric ,,	8 ,,
Distilled water	12 ounces.

Then add a few drops of nitrate of silver solution (nitrate of silver thirty grains, water one ounce), to bring the negative to its proper density.

If the developer get black wash it off, and use some fresh. A developer with acetic acid in it changes very rapidly, and does not develop so clean as citric acid. Citric acid gives a little more hardness to the negative than acetic acid, yet I prefer the former for many reasons. When the plate is sufficiently developed I wash it well, and fix with—

Hyposulphite of soda	1 ounce.
Water	6 ounces.

In a few minutes the yellow tint will have disappeared, and the negative be quite transparent in the shadows. Wash well, dry, and varnish with a suitable varnish.

I have given you the process as I have worked it; and should any member be rather doubtful of success from my description, I shall be very happy to give him any further information.

As I have not had time to give the tannin process a fair trial, I feel that I should be doing it injustice if I were to give you the results of what I have done. I have heard that Dr. Parkinson has been very successful with it; and I for one should be very glad if he would favour us with a paper at the next meeting on that process.

Mr. Beldon illustrated his paper by a very large and choice selection of beautiful stereoscopic negatives and prints, some of which he presented to the Society's portfolio.

Dr. Parkinson asked Mr. Beldon if keeping the albumen so long did not spoil it for working?

Mr. Beldon said the older it was the better it worked, and was much easier to pour on the plate, and the result obtained was very much superior.

Mr. Harland said, when he worked the collodio-albumen process he obtained better results when the albumen was old than when it was new.

After a vote of thanks had been given by acclamation to Mr. Beldon for his paper, the meeting adjourned until the first Wednesday in June.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on the 17th ult., when Mr. George H. Slight, Vice-President, occupied the chair.

After the minutes had been read and agreed to, the following gentlemen were balloted for, and admitted members, viz., Messrs. David Wood, John Muir, and Dr. Sidey.

An elementary lecture on the collodion process was then delivered by Mr. Nicol, which, being for the instruction of the more inexperienced members, has been deemed rather too elementary for publication among the regular transactions of this Society. Mr. Nicol's address was characterised by great clearness and simplicity of style, and the experiments which he performed, illustrative of the various phases of his lecture, so successful as repeatedly to call forth applause. At the close the Chairman tendered the thanks of the meeting to Mr. Nicol.

Mr. Taylor said that by way of starting a conversation he would make a remark or two. He would like to ask Mr. Nicol what effect, mechanical or chemical, was produced in a layer of iodide of silver by the momentary impingement on it of a ray of light? Also, what part the iodide of silver in a sensitive film played in the formation of a developed picture on that layer? On the former he would not remark at present; but on the latter he thought he was almost in a position to prove both that iodide of silver *did* and also *did not* go to form the image. If his memory served him aright, he had developed albumen negatives with gallic acid alone, although there was no free nitrate of silver in the film; and in this case he would ask where the deposit of silver in the lights came from, if not from the iodide in the film? To prove the second position—namely, that the iodide in the film did *not* go to form the image—he might relate an experiment he had often tried. After developing a collodion plate he had, previous to fixing, and by means of a proper solvent, removed the image from the surface, leaving the iodide still there, on which the image could be redeveloped if necessary, or the latent image might be totally discharged, and another image put on the very same film of iodide from which the picture had previously been dissolved.

Mr. Walker remembered reading about a mechanical effect which light produced on the film of iodide, which was to cause a slight sinking of those parts on which the light acted.

Mr. Nicol said the questions raised by Mr. Taylor were of so profound a nature that the ablest photographers alive had failed to solve them. The experiments indicated were highly instructive; and, when Mr. Taylor fulfilled his promise of devoting an evening to the practical illustration of these experiments, he thought some light might be cast on this hitherto little-known branch of photography.

After several other remarks, and a vote of thanks to the Chairman, the meeting separated.

Another ordinary meeting of this Society was held on the 1st instant,—the President in the chair. The following gentlemen were admitted as members:—Messrs. Alexander Gray (George Street), Edward Ayton (dentist), and William Lyon (George Street).

Mr. Davies read a paper *On Gold as a Photographic Agent* [see page 183], which he illustrated by making chloride of gold and toning a number of prints.

Some conversation which followed Mr. Davies's paper will appear in our next number.

A vote of thanks was awarded to Mr. Davies, and a similar tribute to the Chairman.

The business for the next meeting was announced to be a paper *On the Construction and Applications of the Magic Lantern*, by Mr. Taylor, to be illustrated by Mr. Ramage, who, by means of the oxyhydrogen light, would exhibit a number of dissolving views. It was intimated that, for this occasion, the members might invite their lady friends, as the meeting would be of a somewhat popular character.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on Thursday evening, the 2nd instant, in the Religious Institute Rooms,—Mr. D. Brown in the chair.

Mr. James Ewing read a paper *On the Positive Collodion Process.* [See page 182.]

On the conclusion of the reading of the paper a conversation followed on the subject taken up by Mr. Ewing, and on cognate subjects.

Being the last meeting of the session, and photographers becoming busy later in the day, the attendance was meagre; but there was a pleasant and interesting meeting.

It was reported that the Council were making arrangements for photographic excursions during the summer months.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on the evening of May 4th, at the Tower,—J. C. Warren, Esq., Vice-President, in the chair.

There was a very numerous attendance, the room being crowded.

The minutes of the last meeting having been read and confirmed,

The Chairman read a circular received from the Honorary Secretary of the Birmingham Photographic Society, notifying that an Exhibition of Photographs would be opened at the end of the present month, and that it was the intention of the Council to offer silver and bronze medals for the best specimens sent in, in various departments of the art.

Mr. McKie introduced to the notice of the members one of Moule's photogens for taking portraits by artificial light, and stated that above 300,000 portraits had been taken in London during the past season by its aid. The British Government had given an order for two of these instruments, for the purpose of securing photographs of the interiors of certain caverns in India, which could only be obtained by means of artificial light. The light is produced by a composition placed in a metal cup in the centre of a hexagonal lamp, about four feet in height and two feet in diameter, and its glare is thrown through large squares of glass which form two of the sides. A blue transparency is introduced between the lamp and the sitter at the commencement of the operation. The heat of the flame is great, and a chimney is required to carry off the fumes. The composition burns for about twenty seconds.

The members present proceeded to test, by experiment, the qualifications of the apparatus. The operators were Messrs. Laws and Warren, of Newcastle, and Mr. Hill, of North Shields, assisted by Messrs. Porteus and North.

The portraits *(transparencies, which were on tannin plates)* taken by the Council were exhibited in the rooms. All were highly pleased with them, and convinced that portraits could be taken by the aid of the photogen equal to any taken by daylight.

A resolution, expressive of the good opinion entertained of the photogen by the Society, was passed; also, a vote of thanks to Mr. Moule for the readiness with which he sent the photogen for experiment to the Society on learning the Council's wish.

Thanks were given to all the operators.

Mr. Laws' paper *On Transparencies* was postponed, by desire of the Council, on receipt of the photogen. Crowds collected outside the Tower on seeing the light from the windows.

The Chairman exhibited and explained the construction of Mr. Skaife's pistolgraph, and, by means of Mr. Moule's photogen, took several portraits with the little instrument.

A vote of thanks having been passed to the Chairman, the meeting separated.

[We have been favoured with a paper proof from a negative portrait of one of the reporters, taken by the photogen by Mr. Laws, which is certainly very good, many of the former defects incident on artificial lighting having been remedied.—Ed.]

Practical Instructions on Coloring Photographs.

By Alfred H. Wall.

CHAPTER VIII. *(Concluded.)*

For Linen.

High Lights.—White, with a touch of Blue Black.
Middle Tints.—White and Black.
Shadows.—Black White, Umber, and a touch of Madder Lake.
Reflected Lights.—White, Black, Naples Yellow, and Madder Lake.

On Varnishing.

A newly-painted picture should never be varnished if we attach any value to its proper preservation; indeed, if possible, the varnishing is best avoided altogether. At any rate, the paint should be completely and thoroughly *dry*, if not *hard*.*

To avoid chilling, or to apply the varnish with more ease, oil is sometimes mixed with it; but a picture thus treated speedily loses all its brilliancy and beauty, becoming dull, heavy, and discoloured. In applying varnish, be careful that it does not bloom or chill.

Mastic varnish is the more easily applied, but it is sometimes apt to become dull and foggy. This, however, smart friction with a clean piece of chamois leather, when dry, will at once remove.

Copal varnish, although more brilliant and smooth in its effect, is too apt to crack and destroy the painting; I therefore do not recommend its use.

Before varnishing a picture you should see that the surface is not damp; and it is best to apply it in a warm, dry atmosphere, free from dust.

To obtain a very smooth glass-like surface, some painters apply some five or six coats of copal varnish, polishing the surface after each application with pumice stone.

A temporary varnish of albumen, gelatine, or isinglass, is sometimes applied, which can afterwards be easily removed.

Mastic, being a soft varnish, dries rather more slowly than the harder species; and if put in a dusty place, it being long in a tacky condition, will gather a thick coat of dust, which, drying into the varnish, cannot afterwards be removed.

These articles now draw near their conclusion. All the promises I made in commencing them have, to the best of my ability, been duly performed, and, with a few further hints, I will make my best bow and retire.

Hints.

If you find it very difficult to get the colours smooth and even, the cause will be found either in the fact of too little colour having been applied or in that of your medium drying too quickly.

When the colours are sparingly and thinly laid on, your softening brush does not unite and blend them properly, and the result is a patchy unevenness and a painty appearance.

When your colour dries so quickly that the ridges formed by the brush are not removed by the softener, it will be advisable to add a little poppy or nut oil to your medium.

When the finishing colours are the same as those used in the previous painting, the resulting whole will lose the depth, transparency, and brilliancy it might otherwise have assumed.

When the warm-toned colours are laid over the cold a far better effect will be produced than the contrary method would secure. If you glaze too deeply and frequently the picture is apt to become foxy and unnatural.

If you wish to retain the colours on your palette, or some tints which you are anxious to preserve for an unfinished passage, because not exactly sure of reproducing them with the required nicety,† work each tint into a small separate heap with your palette knife, and place them all so close together that a basin, glass, or cup will cover them. The remainder of the palette may then be cleaned, a well-wetted rag laid about the bottom of the inverted vessel, and the whole removed and placed, where it will not be disturbed, in a cool place.‡

When the medium dries very slowly a *little* nut oil may be added to the colour on the palette.

The slab and muller is best cleaned after use with a little of your nut or poppy oil, afterwards with soap and water, and lastly with pure water.

On the smooth surface of the photograph it is difficult to get on the requisite quantity of colour for finishing in one painting; but when this is particularly desirable rub a viscous varnish over the surface with a hog-hair tool, and paint into it. This will enable you to repeat your touches without removing those already applied; but, unless you work very rapidly, and place every colour in its right position at once, the method will either be quite unmanageable or the result be very rough and coarse.

Some colourists, instead of preparing the photograph with isinglass, gelaline, glue, &c., merely brush it over with prepared linseed oil, so as to prevent the paper absorbing the colours too rapidly, arguing that the oil had better find its way into the cardboard than to the surface of the paint. But pictures so painted must be varnished, while the others seldom need it.*

To obtain clean bright effects, touching and re-touching with fresh colour is much better than too frequent a use of the softening brush—the freshness and purity of colours being destroyed by *teazing* them too much with the brush, because the oil is then always worked to the surface. Sir Joshua Reynolds gives us a rule in painting beautiful faces to "keep the whole circumference about the eye in a mezzotinto, as is seen in the works of Guido and the best of Carlo Maratti."

A double concave lens will be very useful in colouring from the life, as by holding it between yourself and the model, at the proper focal distance, you get a picture in small, in which all the colours are brilliantly defined, and their subtle gradations and other peculiarities conspicuously visible—just such, in short, as you get on the focussing glass of the photographic camera. Another advantage this method possesses is the fact that you may examine more intensely and fixedly the image in the lens than you would like perhaps to do if the face of the sitter *herself* were more directly the object to be so curiously observed.

I cannot do better than append to this portion of my papers some further observations from some memoranda of Sir Joshua's:—

"A student should begin his career by a careful finishing and making out of the parts, as practice will give him freedom and facility of hand: a bold and unfinished manner is generally the habit of old age"—and, consequently, of very long experience.

"Let those parts which turn or retire from the eye be of broken or mixed colours."

"Let all your shadows be of one colour: glaze them till they are so."

"Use red colours in the shadows of the most delicate complexions, *but with discretion.*"

"Avoid long-continued lines in the eyes, and too many sharp ones."

"Where there is the deepest shadow it is accompanied by the brightest light."

"Let nothing start out or be too strong for its place."

Keep the colours in the shadows thin and transparent, rather killing the blackness of a dark photograph with transparent and powerful, than opaque and heavy, colours. Another reason for this is found in the fact that, while light is *absorbed* by transparent, it is *reflected* by opaque, colours.

Concluding Remarks.

And so my task is completed. I am satisfied to know that I have started many of my readers on the right road; have pointed out the goal, and urged them earnestly to seek it; and now all that remains to do can be done only by themselves. I have no desire to add to the hundreds who colour photographs, as many of them previously coloured cheap lithographs and engravings, for such remuneration per picture as the unfortunate shirt makers can command per shirt. But I earnestly and honestly desire to see photographers recognise more generally the real value and importance of this new *and not unworthy* branch of the painter's art; and I am sure that the best steps towards such a consummation will be taken by those who really produce artistically-coloured photographic pictures.

The experience I have embodied in these few pages is a portion of that which I have had to dig tediously and laboriously out of the mine of unaided labour. Knowing how very, very hardly such experience is earned, I am the more anxious to help others who may be similarly situated; and being assured by many of the letters I have received that this my sole aim has really been achieved, I have always sat down after my day's professional labours to write my fortnightly quota of instructions with a great deal of cheerful pleasure. In which spirit I now shake you by the imaginary hand you have held out to me, and say—Good-bye!

By-the-bye, before I go, let me quote Barry, the celebrated artist, who said:—

"*It is presumed that reasonable men look for nothing further than mere information in the writings of artists.*"

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* The paint will hardly be *thoroughly* hard in less than ten or fifteen years, perhaps more. Varnishing, when not necessary, is a common mistake.

† In the hurry of work you will frequently mix a tint without remembering the various colours which may have entered into its composition.

‡ It is, perhaps, a better plan to remove them from the used to a clean palette, and put them away on that.

* Oil, I believe, will frequently combine with size.

The author of the preceding paper, in order to render his communications of greater practical value, has kindly undertaken to criticise the work of students in colouring, and to give them advice through the medium of these pages; for which purpose specimens may be sent, with a stamped and directed envelope *for their return, to* A. H. Wall, Esq., 11, The Terrace, Walworth.

Another Lady Amateur.—Will find the promised reply in the above.

Arthur E.—I am glad you have been convinced, because such a belief would be mischievous to you and retard progress. See the earlier numbers of the last volume. The publisher will send them to you, if you make application. I forget in what number they began.

Bothered Bob.—Exactly the same faults in this specimen. What can I say more than I said before? I'm as bothered as you are. The *pure* Naples yellow is greenish. Ask for French or Bright, and you will get the right colour, or add a little cadmium and pink to that you have. At Newman's, of Soho-square, London.

G. L. (Guernsey).—I thank you very warmly.

Notice.—For the next three months I will very readily answer all correspondents per post who will enclose a stamped and directed envelope; but afterwards I cannot promise to continue the same, my time being just now too much occupied.

Foreign Correspondence.

Paris, May 10th, 1861.

The Exhibition of the French Photographic Society was opened on the 1st May. It occupies, as it did two years ago, a gallery in the Palace of Industry, adjacent to that in which the paintings are being exhibited.

As was to be expected, this Exhibition is full of interest, both from the number of the exhibitors and from the diversity and excellence of their works. On first entering, one's eyes are naturally attracted towards the amplified pictures, both on account of their size, and especially on account of the progress made in that branch of photography during the last two years. Two amateur artists, Count Aguado and M. Edouard Delessert, have consecrated the space allotted to them to such works. The first has amplified groups of animals and teams of oxen; and, as there is always some pleasing landscape for a background, he forms rural scenes of charming aspect. These pictures, whose dimensions do not exceed those of oil paintings, are remarkably clear. Whether it be from the excellence of the *cliché*, or from the perfection of the apparatus, or from the judicious proportions observed by the operator, they have not only all the delicacy of detail which pleases us in the best productions of the objective, but also a relief and a perspective which are truly surprising. The vigorous contrasts of light and shade nowise interfere with the proper graduation of the half-tints, and the sh ades themselves are of wonderful transparency. In fact, it will be difficult to carry the perfection of execution any further. A half-length portrait of the artist himself, two-thirds of the natural size, has preserved all the charm of the original picture.

M. Edouard Delessert's exhibition is composed of half and full-length portraits and groups, all of natural size, with the exception of a carriage with ponies of about one-third. The artistic effect of these works is excellent; but, whether it be that the *clichés* were deficient in sharpness, or that the amplifying was somewhat exaggerated, they are slightly *flou*.

MM. Mayer Brothers and Pierson have only a female portrait of natural size, and of exquisite modelage.

The portraitists are numerous, and they have so vied with each other in zeal and talent that it would be difficult to assign to them their respective rank. Pierre Petit has a certain number of his portraits of contemporaries: they are distinguished by their vigour of tone and of modelage, and by a singularly happy choice of the pose. M. Alophe has different characteristics. His pictures are delicate, and approach more closely to the English school. M. Claudet's exhibition shows us that the art of which he was one of the earliest adepts will ever find him in the foremost rank. I admired, and not alone, his beautiful portraits, at once of such finished detail and of such masterly unity. His specimens have a character of their own, neither exclusively English nor exclusively French, but combining, I think I may say, that which is most excellent in the one school and in the other.

M. Bilordeau, a photographer who has already made himself known by his reproductions of bass-reliefs, and who has recently become a portraitist, has exhibited a large number of portraits, which excite general admiration. They are cleverly executed, and of great *finesse*. The poses are well chosen, and the tone is harmonious. On the other hand, the artist surrounds his model with too many accessories. I know that this enables him to compose veritable pictures; but still the principal figure suffers, as the beholder's attention is, so to speak, too much disseminated. The great painters are always sober in the composition of their portraits, and I think that photographers should, in this matter, follow their example.

Nadar only gives us some of the results of his printing with electric light, and some equestrian specimens. These pictures offer an interesting study, and show that the art is entering upon hitherto unexplored regions, and not without success. In a first rapid visit I did not catch sight of Disderi's exhibition; and as the catalogue is not yet printed, I cannot say positively whether he is present or not.

A photographer of Vienna, M. Angerer, has sent very good portraits and visiting cards, which are in no respect inferior to those which are produced here. There are also some fine portraits by an artist of Amsterdam. I did not see any English specimens of this kind, and I much regret it; for we like to compare our productions with those of your fellow-countrymen, and we find such comparison serviceable. For instance, there are, happily, at the present Exhibition, some new views from the Pyrenees, by Mr. Maxwell Lyte. These landscapes possess the same delicacy, the same depth of perspective, the same harmony of tone, which are always to be found in Mr. Maxwell Lyte's works; while the skies give to them an additional charm, and a greater completeness as pictures.

M. Caldesi exhibits reproductions of valuable ancient sculptures in the British Museum. The representation of works of art has also been the chosen labour of M. Fierlants, of Brussels. Baldus has sent a few fine landscapes; Bisson Brothers some magnificent views of public edifices.

I cannot in this letter speak of all the works which arrested my glance during my first visit. I shall return to the subject, and notice the principal productions which figure in this Exhibition, as well as the new processes, or new applications of old processes, for which they naturally claim our attention.

Before closing this letter I will say a word or two on an invention which has been communicated to me. It may be called photographic sculpture. The inventor, M. Villâme, places his model in the centre of a circular operating-room. Four objectives, placed at equal distances round the circumference, give four views of the model—the front, the back, and the two profiles. With one point of a pantograph the artist follows the outlines of each picture, and thus accurately reproduces them with the other point upon a block of clay. The system is very simple, and in M. Villâme's hands yields excellent results. ERNEST LACAN.

New York, April 27, 1860.

At the present time nothing is talked about or thought of but our impending civil war. The martial order inspires every deed and speech. The dragons' teeth have been planted in the whole extent of the country: armed men by the hundred thousand are already in the field eager for battle. The fervent enthusiasm of the people is beyond all precedent: the deepest depths of society are moved. "Shoot the first man who attempts to haul down that flag!" is the sentiment which manifests itself in every possible way. New York is all in bloom with "the star-spangled banner;" the "stars and stripes" float everywhere—on the house tops, church spires, and from windows and doors of stores and dwellings; stages, cars, carriages and their horses, are all decked out with the patriotic emblem; pedestrians show their colours in badges, rosettes, and breast pins. All these things mean war, and it is said war to the knife and knife to the hilt; and how fearful when we remember that it comes from the animosity of a house divided against itself!

I draw a long breath and ask myself if I need to make an apology for introducing this painful subject, so foreign to our peaceful art. I will only say that no letters are written without allusion to it, and I believe it will have a very notable bearing on the condition of photography in America.

Photography, like other avocations which do not contribute to the materials for warfare, must for a time be prostrate: already many of the practical photographers, by virtue of the opportunity or even necessity, in the name of patriotism have gone into the armies. For the few days, however, in which the military are being enrolled, some of the photographic galleries are thriving: the wise soldier makes his will, and seeks the photograph as possibly the last token of affection for the dear ones at home.

You must therefore expect little of photographic novelty from America for possibly many months to come. There are, however, a few matters, not altogether new, which I trust will prove of interest to the readers of The British Journal of Photography.

Another new lens? We have heard about the orthoscopic, aplanatic, panoramic, triple achromatic, * * * * * and are vastly astonished at the fertility of the European optical genius. We are indeed bordering on bewilderment, especially when we

remember what fine daguerreotypes we used to make with a spectacle glass which cost only a dime! Is it possible that the great names cover the great realities which the advertisements set forth?

But America now enters the lists in the race for the perfect lens. Mr. C. C. Harrison, of this city, has recently brought out a lens which is claimed to be able to perform what hitherto has been deemed impossible, viz., to make a ninety-degree view, free from distortion, and evenly lighted. The lens is composed of two symmetrical achromatic meniscus lenses, so set that their convex surfaces are in the same sphere. The outside curvature subtends an angle of 90°. Of course the radius is short: the stop is placed at the centre of the combination. It is evident that the construction of the lens provides for an uniform and equal treatment of the incident rays which pass through the stops. The rays which shall form the image strike the lens nearly at right angles, pass through without loss, while oblique rays are eliminated by reflection. Thus intenser lighting is secured with a stop of given size, and the lighting is uniform to the extremes of the image. The practical tests with the lens are conclusive: those of our photographers who have used it and compared its work with that of other lenses consider it a very valuable acquisition to our art. I enclose a stereoscopic view, made with one of the smaller lenses, of the studio of one of our skilful amateurs. The even lighting and sharpness are evident at a glance, and any one skilful in perspective will easily determine the angle of view.*

I have spoken of this invention as another new lens; but there are those who believe that its construction was well understood nearly twenty years ago. At that period it is shown that Mr. A. S. Woolcot, then residing in New York, claimed to have invented a lens which he spoke of as a ninety-degree camera. While he was putting his ideas into a practical shape he was seized with a sickness which resulted in his death in 1843. The only relic of Mr. Woolcot's camera at the present time found is two unconnected meniscus lenses, which, when achromatised and mounted, will form a combination precisely like that of Mr. Harrison's. The exact degree of merit which is due to Mr. Woolcot may never be determined. CHARLES A. SEELY.

Correspondence.

MR. NEGRETTI'S REPLY.

To the EDITOR.

SIR,—Doubtless the letter of your Paris correspondent, M. Lacan, surprised many persons besides myself. I feel much obliged to you for calling my attention to it. It is certainly so extraordinary a statement, that I hardly know how to frame my reply. I, however, ought to feel flattered; for I really believe I am the only person the great M. Ferrier has ever condescended to notice in a photographic journal. Not that his name and mode of operating have never been alluded to: for he has had more opportunities than any other ever had to set photographers to rights—but no! never a word from him—not he. So long as mushroom photographers attributed all manner of absurdities to the mode of the production of his pictures he never uttered a word. He allowed one to state that they were reduced from large negatives; another to say that they were printed by artificial light; a third that they were not printed on albumen at all. In fact, so long as they managed by their absurdities to throw photographers off the scent, he chuckled and held his peace; but as soon as he hears that pictures have been favourably criticised by an independent editor, and that they are stated to be produced by his method, and that method is divulged, up he starts, and, with a "*sacre!*" denies *in toto* everything—asserts the process *not* to be his—and calls the person (that's me, Mr. Editor) an impostor, if not worse. M. Lacan winds up his tirade by saying "Mr. Negretti had better look to it." Well, M. Lacan, I have looked to it, and I will state the result of my investigations:—

1st. I find that about the year —, whilst I was doing a good deal of business with M. Ferrier, he (M. Ferrier), *in his own house*, at No. 8, Rue Cocquillex, Paris, on the fifth story of the said house, in the room facing the street, did willingly and unreservedly (so he told me) go through the albumen process, from the coating of the plate to the developing and fixing the picture: I believe his son was present, but of this I will not be certain.

2nd. That M. Ferrier, at my own request, let me have a whole plate negative, as a standard to work up to, which negative (the subject being the river Seine, at Paris, with one of the public baths in the foreground) was exhibited by me at the time I gave the lecture, 1st March, 1855, as M. Ferrier's negative; and you, Mr. Editor, as also many more who were present, will doubtless remember it.

3rd. That some few months after delivering the lecture—wherein I stated to whom I was indebted for my knowledge of the process—I told M. Ferrier of the circumstance of my appearance at the Photographic Society, the lecture, and my having acknowledged him as my instructor: he did not express any disapprobation of the course I pursued. At that time I presented him with some pictures I had produced—among others the nave of the Crystal Palace.

Now, Mr. Editor, this was five or six years ago, when he had not made £30,000 or £40,000 by transparent pictures, as he is reported to have made since then. One thing I have omitted to mention, which, in justice to M. Ferrier and myself, I must do, viz., neither of us had the most remote idea, at the time he exhibited his process to me, that I ever should take it up as a matter of business. The man who has never opened his lips or given the slightest hints, but always allowed photographers to flounder about wide of the mark, would not be very fast in showing his *modus operandi*. But why not deny my statement before and not wait *six* years to do so? But, after all, perhaps it's all a mistake. M. Ferrier probably told M. Lacan that the process was not the one he *now* adopts: if so, *a la bonneheure*, we all know (I presume) that M. Ferrier's pictures are not what they used to be—that their character has changed; in fact ever since he has been in partnership with M. Soulier—this latter gentleman's pictures having more half-tones and more atmosphere, and hence the reason probably why M. Ferrier left no stone unturned to obtain M. Soulier for a partner. With reference to M. Lacan's statement that M. Ferrier has used his procees in hot and cold climates without any inconvenience, has M. Ferrier ever been further than a few hours' journey from any large town or city where he could obtain any chemicals required for the albumen process, or even obtain a fresh stock of prepared plates from home if needs be? His having taken views in Italy or Switzerland is no test that he would not be at times inconvenienced in distant countries, such as China, Japan, or Siam, where one of our photographers is at present, and at times where not even a drop of rain water is to be had; where on occasions, through the failure of a steamer, spoiling of chemicals, or some such casualty, the photographer has had to make his nitrate bath, gallic acid, iron solutions, and in fact to set to work with *only* his camera, lens, and glasses in his possession. Is the secret of M. Ferrier's annoyance that if he be not driving such a roaring trade as formerly he may attribute any falling off to my having entered the field? If so that may explain the "reclamation" of MM. Ferrier Pêre et Fils.

The charge M. Ferrier makes against me is a very grave one, and I say it is most unfounded, *as he well knows*. I need not, Mr. Editor, assert to you my incapability of stating that which is false; the same observation applies to all who personally know me. I feel quite confident on that score. I feel also certain that you, sir, will take proper care of my reputation with that large number of your readers who may be strangers to me. Had I done as many others—who, if the advertisement duty had not been repealed, could not have had their speeches printed without incurring the duty—and had I claimed the process as my own, I should have been thought a clever fellow; but as it is, and because I took the upright course and acknowledged the source whence I derived the little knowledge I possess, I have aroused M. Ferrier's ire. I leave the matter, however, with perfect confidence in the hands of your readers; and apologising for troubling you, I am, yours, &c., H. NEGRETTI.

MOUNTING STEREOGRAPHS.—TANNIN PROCESS.

To the EDITOR.

SIR,—I am venturing again to trespass on your kindness by requesting that you will be good enough to inform me, through the medium of the Journal, whether I am correct in mounting stereoscopic pictures after the following manner:—

I have a binocular camera with the lenses fixed without lateral movements, the interval from the centre of one to that of the other being three inches and three-eighths. Exactly the same interval exists between the corresponding parts of the same object in the two pictures. But, if the interval between corresponding parts, when the two pictures are separated, reversed, and mounted, should be only two and three-quarter inches, it seems to me clear that the only way to effect this is to cut off the five-eighths too much in equal portions from each picture, taking the left side of one and the right of the other. Am I correct; and, if not, how is it managed?

I take the opportunity of saying a word in favour of the tannin process. I can fully endorse Mr. Sutton's statement, that it is the best dry process yet known. The principal objection made to it, namely, the liability of losing the film, is not valid. I never find the film separate from the glass; and I believe the secret of success in this respect is to dry the glass well *immediately* before it is coated with collodion. I take the liberty of sending you a specimen, to show you of what it is capable, even in non-artistic hands, and to have the benefit of your criticism for subsequent improvement. The lens used was Dallmeyer's No. 1 portrait, the back combination taken out and the front put in its place, with a 5-16th of an inch stop, so as to focus as an ordinary view lens, not intended to cover quite so much as six by five, the size of the present plate. The exposure was five minutes, at 2 p.m., opposite the sun, but the sun not shining much. It is not so bright and clear as some I have; but I think the definition is very good. I suspect it was exposed a little too much. I cannot even obtain much more intensity than this one has. My development takes from five to eight minutes, the developer being two grains of pyrogallic acid, one ounce of distilled water, and fifteen or twenty minims of citro-nitrate of silver, consisting of twenty grains of nitrate of silver and twenty grains of citric acid to an ounce of distilled water.

* The Editor will notice this picture in the next number.

I have troubled you with a long story: a brief reply at your leisure will much oblige.—I am, yours, &c., MEDICUS.

Bristol, May 7th, 1861.

[We find that a brief reply will not meet the case, so that we shall write a short article on the first subject to which allusion is made in the preceding letter, and insert it in our next number.

The negative received is by no means deficient in artistic excellence, with the single exception of the illumination, which, from the position of the sun (nearly behind the operator), precludes the introduction of the important pictorial element of effective shadows; there is therefore want of contrast and consequently density. It is quite enough exposed, but we scarcely think too much so. Had there been shadows enough the plate would have borne more development with advantage; but, as it is, this would not have increased the contrasts, but simply added to the time required for printing. The performance of the lens and, we must add, the manipulation are both highly satisfactory; the definition at all parts of the plate ample; and the quality of the illumination indisputable.—Ed.]

ACTINISM IN AUSTRALIA, &c.

To the Editor.

Sir,—Mr. Hardwich, in his 'Comments," No. 22, has allowed his imagination to run away with him, and has ascribed to actinism what is but an incidental circumstance. In Melbourne, in consequence of the general use of wood for fuel, there is little smoke; but in other respects the weather is very similar to that of the past month, only with a higher temperature.

Mr. Hardwich gives Mr. Osborne's method of remedying foggy pictures. I think it would have been better had he given us the law of fogging and its remedy. Fog is reducible to rule, and can be instantly remedied—in fact, it is a very simple affair, and should not puzzle a chemist.

With regard to the instantaneous process of Dornbach, page 167, that gentleman can make a much quicker collodion if he will read some of our old friend Burnett's papers, written a long time ago, in your back numbers. I am sorry to see that we never get anything from his valuable pen now.

With reference to the new process of photography without a bath, I communicated a process of that kind to the late Mr. P. W. Fry in 1849 or '50. Many of the precipitates of silver have the property of being reduced and showing the action of light. Take the white of an egg, or a little collodion, and shake up in it sufficient chloride of silver to give it a milky appearance; now let it stand until the larger particles subside, and with the milky liquor prepare the glass in the dark room. On drying (or setting, if collodion), expose; then immerse in bath, and develop as usual. Most of the precipitates of silver, especially iodides and bromides, would, no doubt, act in the same way.

The most curious fact I noticed was, that although the bottle was kept in diffused daylight the picture was taken with certainty, thus showing that it was the ultimate action of light which the developer rendered visible, and that former impressions were effaced.—I am, yours, &c.,

A. K. SPARKE.

[Mr. Sparke is, doubtless, correct in supposing that the London smoke is the cause of the degradation of the light; but where is the remedy? The sun emits abundance of actinism, but in passing through vapours floating in the atmosphere much of it is lost; hence those portions of the earth's surface are best for photography where mist and smoke are least abundant. Travellers in Egypt and Syria assure us that photographic pictures are taken with wonderful celerity, simply from the excessive clearness of the air; and even in this country, where conditions so favourable but seldom occur, there are days on which one-half of the usual exposure will suffice. Amateurs commencing the dry processes should familiarise themselves with the appearances indicating quick action. They are shortly as follow:—Fleecy clouds, with intervening sky of deep blue; absence of yellow vapoury appearance around the sun; distant buildings seeming near at hand, with the projections sharp and well defined; wind westerly or south-west, in preference to east or north-east. After a day of this kind always commence the development of the dry plate with a very small quantity of nitrate of silver, and carry it on slowly, in order to avoid excessive contrast and intensity in the negative. This observation applies particularly to stereoscopic lenses, with which amateurs mostly commence their practice.—T. F. Hardwich.]

BATH.—FOCUS.—STEREOGRAPHS.

To the Editor.

Sir,—Will you please say what is meant by exposing a bath to light to remove organic matter, as recommended by Mr. Barber; that is, how long the bath should be exposed? I have always thought that exposure to light affects the bath injuriously.

To ascertain the length of focus of a lens, I hold the lens in my parlour and allow the picture to fall on a sheet of paper suspended on the wall opposite the window. Am I to take the distance between the front or the back combination and the picture as the length of focus?

As regards stereoscopic pictures, I should esteem it a favour if you will say how much of the picture should be cut away before mounting. I have an impression that more is taken from one side than the other. Trusting I am not trespassing too far on your kindness, I am, yours, &c.,

Birmingham, May 8th, 1861. TYRO.

P.S.—I should have said, with respect to my last question, my lenses are two and a-half inches apart.

[1. If a bath contain organic matter, exposure to light causes it to become blackened and precipitated as a compound with oxide of silver, which can be removed by filtration. No injurious effect arises from exposure to light.

2. To ascertain the equivalent focus of a compound lens, procure a common spectacle lens and measure accurately its distance from the point at which a distinct image of the sun is formed. Then select a distant object—a house, for instance—and measure the size of its image formed by the same lens. From the *same spot* ascertain the size of the image of the house formed by your compound lens; then, as the first image is to the focus of spectacle lens, so is second image to equivalent focus of compound lens.

3. We have written an article in reply to another correspondent "Medicus," which will meet your case.—Ed.]

OPERATING PLACE, &c.

To the Editor.

Sir,—I shall feel much obliged if you will inform me the best way to arrange and shade my portion of the garden for taking portraits out of doors? It is about thirteen feet wide (with side of a house on either side) by about thirty feet long. I have placed a light muslin covering over the head of the sitter; but the head and upper parts are always under-exposed, whilst the legs are over-exposed. How high should the covering be from the sitter's head? and how far should I bring it forward? In the afternoon the sun shines under the covering on to the sitter, although the cover projects out about six or seven feet. I cannot get any shadows: my pictures are *a la* soot and whitewash with exposures of thirty and forty seconds. I buy ————'s negative portrait collodion ready iodised. Do you consider a collodion sufficiently sensitive when purchased ready iodised?

Which is the simplest way of cleaning my plates from the amber varnish for use again?

And can you tell me the cause of my negatives having white patches on after they are varnished? I think it is the way I varnish them, as they appear as the varnish dries. I always warm the plate first, and dry near the fire. The patches show in the printing.

I have made some intensifying solution (as advised in your Journal at one of the meetings) of iodine dissolved in water, with iodide of potassium added, but on applying it to a negative (developed, but not quite intense enough), I expected it would make it blacker; but the picture nearly disappeared, leaving the film yellow and opaque. How ought I to intensify with the above solution?

With many thanks for past favours, and hoping this will be the last time I shall have to trouble you,—I am, yours, &c., PHOTO.

May 6, 1861

[Your covering over the sitter's head is no doubt too low down. The exact height for the best effect will be most readily ascertained by direct experiment, thus:—Hinge the frame bearing the covering *at the back*, and, with a cord and pulley, raise the front until you *begin* to perceive the shadows under the brow, nose, and chin of your sitter too strongly marked; then go back a little from this point. You had better arrange a moveable screen behind the camera to intercept the rays of the sun, and prevent their shining on the sitter. This is not difficult if you employ, for instance, a sheet, with a cord from each corner, and four little pulleys, two on either wall, so that you can raise the sheet to a height of ten or twelve feet if need be, or bring it down as low as convenient. The same arrangement will enable you to place it more towards either side, or in the middle, as may be requisite.

Why not buy your collodion in separate solutions, and iodise it as you require it? We think that plan preferable. To clean your plates, you have only to pour on each one of those varnished with amber varnish a little waste collodion, and immediately, while it is still fluid, rub it with a tuft of cotton or piece of rag, and at the same time add a few drops of solution of common washing soda, which facilitates the removal of the compound of varnish and collodion. The white patches in your negatives arise from the varnish becoming chilled on drying: you cannot, in this instance, allude to amber varnish, we presume. The use of the solution of iodine is only preliminary: your film should be washed, then covered with a weak solution (five grains to the ounce) of nitrate of silver, *in the light*, and then redeveloped by more pyrogallic acid.—Ed.]

RESIN PROCESS.

To the Editor.

Sir,—Since writing to you on the subject of the resin process I have been trying the iron developer on these plates, and find it admirable. The extreme softness and multiplicity of detail it gives renders it very desirable for stereoscopic subjects.

Protosulphate of iron	5 grains.
Citric acid	½ grain.
Water	1 ounce.

Add a few drops of silver solution, as usual, before developing. If well exposed, the detail comes up very quickly. I intensify after fixing. Very great intensity may be obtained, if desired, by this method, and a very beautiful purple brown tone obtained—just the thing for transparent positives, for which the resin process is admirably adapted.

I omitted in my last to notice Mr. Glover's remark on the appearance of circular insensitive patches. I do not think the resin can be blamed for them. If the plates are immersed in a dish of water, and taken out before developing, these circular patches are very visible: they do not appear to have been wetted; but take the plate and pour water over it, so as to make these patches take the water, which they soon will do, and then even two grains of resin to the ounce of collodion can be used without incurring them. I always prefer, however, about one-third of a grain to the ounce, and work with a collodion so horny that if there should be (which is seldom) a scummy stain on the negative, it may be wiped off, and the negative cleaned with a piece of cotton wool—of course after the negative is dry. No powdery film will stand that; and, although the powdery films are given out to be the best adapted for the dry processes, I can confidently state that for the resin process they are not by any means equal to a horny one.

The negatives have all the appearance of fine wet negatives: the bloom upon them is beautiful.—I am, yours, &c., F. PARSONS.

Leicester, May 3rd, 1861.

TANNIN PROCESS.

To the EDITOR.

SIR,—A day or two ago I forwarded to you a tannin negative, which I hope arrived safely. I now trouble you with a print from another negative of the same building—the Bristol General Hospital—taken since the one which I sent you. It was exposed little more than half the time of the former, but in all other respects the same. It came out a good deal brighter and clearer; but the sky presented a curious appearance, such as you will see in the print, which I often get in the dry processes, and cannot tell why. I suspect it has something to do with the removal of the preservative coating previously to the development, as it occurs much more frequently when I do not let the plate remain some time in water before developing it. Can you enlighten me?

I send also a stereoscopic picture taken by the same process, with one of Ross's new lenses, and quarter-inch stop. The first combination alone was used, reversed as a view lens, and the exposure was a minute and a-half, on a bright day, without sun, about 1 p.m., the sun being opposite. I find the tannin process very simple and very sure, free from stains and all the usual drawbacks of a dry process; and it certainly is, in my hands, quicker than the Fothergill. The keeping qualities of the plates in hot weather have yet to be tested.—I am, yours, &c.,

Bristol, May 9, 1861. MEDICUS.

[Your proof is excellent, and justifies all we said of the lens in reply to your former note; the same applies also to the stereoscopic one. The fault in the sky may be owing to the fact of not sufficiently soaking the plate before development; as Major Russell has pointed out that when first wetted the collodion preserved with tannin *expands*, but, by allowing sufficient time to soak, it again contracts when perfectly wetted. It is just possible that it may be due to another cause—irregular density of the collodion. In this case we have found the addition of from five to ten drops (minims) of chloroform to each ounce of collodion a perfect remedy. On first adding it the pyroxyline is precipitated in gelatinous beads, but will re-dissolve on shaking, after which the collodion flows very smoothly and evenly over the plate.—ED.]

TEST WANTED FOR PAPER PROOFS.

To the EDITOR.

SIR,—Can you tell me any simple test whereon an opinion may be founded as to the probable permanence of proofs?

I am frequently offered what *appear* to be very good stereographs at prices so low as to excite my suspicions that they must be sulphur-toned, and perhaps not very carefully washed. I could purchase views (undoubtedly from good negatives) at —s. or —s. per gross. *Can* they be worth having at that price? If there be any way—not too complicated—of ascertaining *the* important point, will you add to the debt of gratitude I already owe you by informing me in the next number of your Journal? * * * * * *

—I am, yours, &c., W. J. G.

[We have it upon very good authority that the prices you have quoted would barely pay for materials and labour of printing, if such were done by the gold-toning process, without reckoning anything for profit or for the use of the negatives. With regard to a simple test, there are several which will, as it were, afford an indication as to whether a print is sulphur-toned or not; but we know of none that can be absolutely relied upon. If a hot iron be passed over a sulphur-toned proof, the smell of sulphur can generally be detected. If the same be submitted to the action of diluted hydrosulphate of ammonia, material deterioration of the tone will very rapidly occur, and final destruction of the proof ensue; but, if it be a gold-toned proof properly manipulated, it will resist the action of this destructive agent for some considerable time without showing signs of deterioration. Again, chromic acid will act much more rapidly upon the sulphur-toned than on the gold-toned print. Your course of proceeding then would be to sacrifice one copy at least, and act upon the principle *ex uno disce omnes*, subject it to the tests proposed, and if it resist them tolerably well you may conclude that the parcel is worth having; but if not, at once reject the whole. We may remark that you ought not to expect to get good proofs at the price named.

Your concluding remarks we omit for obvious reasons: your flattering remarks we do not receive unalloyed with regret that there should be cause of complaint in the quarter named.

With regard to form, we quite agree with you; but it is not a question for our department, and we take it that our publisher knows more about it than we do.—ED.]

ACCELERATION.

To the EDITOR.

SIR,—What your correspondent, J. Macklington, asks about under the above title, I had done for me by the late Mr. Ross, half-a-dozen years ago, to a £14 lens, three and a-quarter inches diameter, making the tube about two inches longer inwards, and thus so much nearer the focussing glass. This is the only lens I work with, except for the larger photographs. It is quicker and larger, and gives more solid pictures.

I am, yours, &c., O. G. REJLANDER.

Wolverhampton, May 7th, 1861.

ANSWERS TO CORRESPONDENTS.

OMISSION.—In making up the "formes" for our last impression, the printer accidentally omitted the acknowledgment of the article by M. Mc-A. Gaudin, as translated from *La Lumiere*.

F. J. P.—See Mr. Barber's paper in our last number.

R. J. P.—We are sorry to say it has "passed like the baseless fabric of a vision."

INQUIRER.—Mr. Charles Jones, of Birkenhead, will no doubt supply you with some on application.

W. M.—The article was retained by the author for correction. You will find it in the current number.

BORE.—Not at all; we will cheerfully give you the advice sought for. Send your inquiries at once.

ANDREW LOMAX.—1. See reply to "John Bowen."—2. Pyrogallic and acetic acids.—3. Hyposulphite of soda.

R. REID.—You will perceive that we have already noticed the matter to which you make allusion in our last issue.

F. M.—Our notice would not do you any service, as we could not commend your specimens; the manipulation is good, but the treatment very inartistic.

R. BROWN.—We are quite ready and willing to afford you advice and assistance through the pages of the Journal, but *not* by private note; and as to testing apparatus for you, it is quite out of the question.

TRUSTFUL TOMMY.—We think you should be cautious in such a matter; there are too many traps for stray cash, couched in similar terms to those in the advertisement enclosed, to allow of our having much faith in the integrity of the advertiser.

R. BRACKENBRIDGE.—We are unacquainted with the commercial details of photography; but if your object be simply that of reciprocity, we cannot do better than refer you to the prospectus inclosed with the current number, and the paragraph on the same subject in our leader.

A. K. S. (Devonport).—We are so little satisfied with the tone of your communication in reference to an esteemed fellow-labourer, that—although we should have published it had the remarks been directed against us personally—we have, as it is, forwarded it to him for reply.

JOHN BOWEN.—Your negatives appear to us, from the proof sent, to be very much under-exposed: we should recommend at least double that given when you next operate. There is no detail in the darker parts, and the contrast is far too violent between the lights and shades.

BEGINNER.—1. You have not done amiss for a novice; but you have left your print too long in the toning bath, hence its cold bluish tone.—2. You will find Hockin's *Manual* quite suitable to your wants; we presume you mean his *last* edition.—3. See paper by Mr. Barber in our last number.—4. Very good, but not the best.

IGNORANT OPERATOR.—You will perceive that our own feel ng quite tallies with yours in the matter alluded to by you; it is, no doubt, the handiwork of the South Kensington officials. We sincerely trust that none of our leading photographers will be induced to contribute a single picture with such an arrangement. We certainly will agitate to get up a strong opposition, unless more just treatment be accorded.

A YOUNG PROFESSIONAL.—We willingly give you our advice. Your plan renders your position perfectly intelligible, and it is clear that in your case your sitter *must face the south*. By a proper arrangement of blinds there will be no need for you to shift his position at all. Place your glass room at the *west* end of the garden, and raise its floor about eighteen inches from the ground; you will thus be able to have glass within two feet of the floor on one side and end, and all the way down on the other side. As there is room for fifteen feet of length, we advise that you should have it as long, and not less than seven or eight feet wide and eight or nine feet high—say eight feet on the west side, and nine feet on the east, giving the slope towards the west. Your entrance door must be at the south-east corner. Your dark room may be attached to the north-east corner of your glass room, and would thus not interfere with the light on either side, as it would be near the sitter. You must have metal rods running along the top on both sides, on which the rings of calico blinds may run, which will enable you to shade your sitter from the overhead sun to any extent. Similar blinds, to slide on rings at top and bottom, should be arranged on each side and the south end: these blinds may be in three pieces each for the top and both sides, and in two pieces for the end. You will thus be able to shut off the direct sunlight from any direction, or leave the whole fully exposed in dull weather. Your waiting-room may be well placed at the north-east corner of the garden, next the two high walls, and thus you can manage without renting the adjoining ground at all.

HIGHLAND LADDIE.—1. We are of opinion that the lens which produced the three pictures, each containing *two* sitters (male and female), as also that one of a gentleman with the bald head, beard, and moustache, is as fine an instrument as any hitherto made. Of the other four proofs, those of the ladies are not properly focussed; that of the gentleman with a stick in his hand is good, but not equal to the four first named; while that of the same gentleman, upon a larger scale, is deficient, because the lens has been set to do work for which it was not constructed. We presume that the whole of the negatives were taken by the same lens, consequently the faults of the four last-mentioned proofs are not due to any imperfections in the lens, but to errors of manipulation.—2. Provided that you do not attempt to take pictures upon a *larger scale* than that of the bald-headed gentleman, a two-inch aperture will be very appropriate to use with the lens; but if the sitter be nearer, so as to produce a larger image, you must reduce the aperture to one inch, in order to obtain moderate definition, but in this case the exposure would become very protracted in consequence.—3. Toning bath: dissolve eight graius of chloride of gold in one ounce of water. Dissolve also forty-eight grains of carbonate of soda in *another* ounce of water. When about to operate, measure out *one drachm* from each solution, and add each separately to half a pint of water; mix the two half pints, and stir till effervescence has ceased, then immerse your prints. In cold weather you will find it advantageous, if not necessary, to warm your solution to seventy or eighty degrees Fah.—4. From three-eighths to three-fourths of an inch, according to circumstances.—5. A difficult question, perhaps impossible for us to answer strictly; but we think if you apply to Mr. C. Jabez Hughes, of Oxford Street, London, he may assist you. It is not the *light* which has faded the picture of which you complain, but the atmosphere, although under a passe-partout. Do you ever burn gas in the room in which it was hung?

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 143, Vol. VIII.—JUNE 1, 1861.

Stains and Streaks.—At the last meeting of the Photographic Society (London), in a paper on this subject by Mr. Thomas, an attempt was made to demonstrate that in most of the stained and streaky plates produced by amateurs the defects specified arose principally from the admission of too much light, or of light of an improper quality, into the pseudo-dark chamber. During the reading of the paper we made, as is our wont, several memoranda, for the purpose of prosecuting further inquiry or discussion relative to the question under consideration, and we now propose to enter a little more fully into the same than there was time for doing at the meeting.

On looking over our notes we find that the first which we made of a decidedly dissentient character relates to the following proposition, which we quote, viz.:—"I think it will be allowed," argues Mr. Thomas, "that the more sensitive a prepared plate is to objects in shadow, the more sensitive it will be to yellow light; and, if a preparation could be made capable of producing a landscape in the camera illumined by moonlight, I need hardly remark that it would be necessary (arguing in the abstract) to prepare this highly sensitive plate in total darkness, and develop it under precisely similar circumstances."

We can by no means accord our assent to this doctrine, and believe it to be fundamentally erroneous. It is the *quality* of the light that should be carefully attended to, and when that is of the right sort its *quantity* is immaterial. It is not a good plan to work with too little light; for by so doing the operator is liable to all kinds of inconvenience, and to the inadvertent production of flaws and blemishes from being unable to see properly what he is about. In the event of the *quality* of the light being improperly cared for, so that a certain portion of ordinary actinic light finds its way into the operating chamber commingled with that of a chemically inert character, then indeed its quantity in the aggregate becomes of serious importance, and it is only by keeping it at a minimum that one is able to operate at all; but such a mode of treatment must be regarded as merely temporarily palliative, and not at all curative of the evil. It would be altogether unphilosophical to regard mere palliation as remedial; and therefore we could not but view with suspicion the recommendation to reduce *generally* the amount of light wherewith to work, simply *because* the materials at present in use are far more sensitive than they were of yore.

That it is quite possible to employ a flood of non-actinic light without detriment to the most sensitive film hitherto discovered is well known to many who have made experiments in order to test the point. A solution of disulphate of quinine can be prepared so as to arrest *all* the *actinic* rays, and yet allow of the passage of the luminous ones apparently unaltered: so that it would be quite possible to construct an operating room chemically inert, and yet lighted by means of a window allowing of the free passage of white light. This might, we fancy, be a very great convenience where printing and toning operations have to be carried on upon an extensive scale. It is to Professor Stokes that we are chiefly indebted for a knowledge of most of the phenomena connected with what is termed "fluoresence," and their bearing upon photographical operations; and those who feel interested in the subject will do well to consult what he has published in reference thereto. If we remember rightly, glass stained a bright yellow colour by means of oxide of bismuth acts very energetically in arresting the chemical rays; and it would therefore appear to be particularly fitted for the use of the photographer, because glass of this kind can be made coloured throughout, and not merely "flashed" on the surface—a condition which, as Mr. Malone pointed out in the discussion following Mr. Thomas's paper, must always leave a sheet of glass liable to actinic leakage, from the impossibility of making sure of the absolute covering of every part of the surface, which, if carefully examined, generally exhibits unprotected spots—of microscopic dimensions it may be,—but, if numerous, quite enough to admit a very appreciable portion of "unfiltered" light.

This brings us to another memorandum which we find on our list, to the effect that there seemed to be at the meeting some confusion relative to the cause of the alleged impression upon the plate of streaky lines in the direction of the dip. Now, assuming that ordinary actinic light has found admission into the yellow chamber or camera, and that the plate is withdrawn from the bath at a time when the silver solution runs into streaks, there is no necessity for the supposition of any concentration of the rays by refraction, as suggested by one of the speakers, because the said streaks are caused by the nitrate of silver solution leaving certain parts of the film and adhering to other parts: hence there is a positive difference in the sensitiveness of these several portions, and consequently there might be sufficient activity in the contaminated light to affect the more sensitive portions of the film, but not enough to impress strongly the remainder. Granting the existence in the dark room of light of an improper quality, we see no objection to Mr. Thomas's theory relative to this as one cause of streaks; but the proposed remedy we regard as altogether insufficient, as before stated.

To the explanation assumed by Mr. Thomas relative to the action of the translucent and opaque films respectively, we find we have the single word—"query"—as a comment. We are rather disposed to conclude that the translucent film having the particles of iodide more minutely divided than is the case in the dense opaque film is more sensitive, and hence that fact alone would be sufficient explanation of its greater liability to injury under the circumstances supposed.

The experiments detailed relative to the respective influences of a weak and a strong impression consecutively upon the same film are interesting, but quite compatible with known theoretical considerations; while we are however indisposed to admit that stains and streaks are so generally traceable to improper light in the laboratory as the author of the paper supposes, he has, doubtless, done good service to tyros in our art in drawing attention to this source of annoyance.

Instantaneous Stereographs.—A few days back we had an opportunity of examining some "instantaneous" street scenes in Paris produced by M. Ferrier, to which allusion was made in laudatory terms by M. Lacan, in a recent number. That these are highly interesting and meritorious we accord willing testimony; but we confess that it is not without satisfaction that, we find on inspection, some of a similar character produced by our own countryman, Mr. George Wilson, and which we noticed some time since in our critical column relating to stereographs, certainly surpass them, especially a view in Princes Street, Edinburgh, and one in Regent Street, London.

International Exhibition of 1862.—It is with sincere satisfaction that we observe the position assumed by the Council of the Photographic Society with reference to the representation of Photographic Art in the forthcoming Exposition. Until appealed to by the Commissioners it would have been undignified for the Council as a body to have made any direct remonstrance, although in due time it would have well become it to have taken the initiative in organising such an Exhibition as would have effectually rescued the practitioners of our art from the alternative of either submitting to the indignity of being ranked as mere mechanics or of altogether foregoing the display of their productions. It is still possible that such an unpleasant duty may yet devolve upon the Council, for it is a difficult matter to move individuals invested with high authority, much more bodies of them, to reconsider isolated points of a question regarded by them as already settled; but if anything can do so, it may be expected that the sound logic displayed in the excellent letter from Sir F. Pollock, published in our last, will have the desired effect. It is not without pleasure that we observe the views expressed in Sir Frederick's letter coincide very closely with those detailed in our article in a previous number, and that, consequently, we have not inaptly represented the general feeling of our constituents.

As if also to offer a comment upon the discourtesy contemplated by the Commissioners towards our foreign brethren of the camera, in thus depreciating the result of their labours by inviting them to contribute under such humiliating conditions as those sought to be imposed, we point to the commencement of M. Lacan's last letter from Paris, in which he incidentally mentions the very different treatment experienced by the profession at the existing Paris Exposition, where photographs are found in their due position amongst other works of art.

We have before expressed our conviction that the influence exercised in misplacing photographs in the list already issued by the Commissioners emanates directly from the authorities of the South Kensington Museum. Can it be that these gentlemen have judged of the capacities of our art only by the productions of their own establishment? If so there may be some excuse for them.

PHOTOGRAPHIC COMMENTS.

By T. F. Hardwich.

No. XXIV.

If any one question can be said especially to interest photographers at the present time, it is that of transparencies for the stereoscope. Numerous artists in every part of the country are anxious to produce them with certainty; whilst the public on their part are equally desirous of purchasing. A favourable notice of a series of Java stereographs appeared in this Journal not long since, and those who have seen them will allow that the Editor's praise was not misplaced. Mr. Negretti, the producer of the slides, is well known as a man of skill and enterprise; and this admission we the more readily make, because it is our intention to break a lance with him in the present article. It will be better, perhaps, to come at once to the point, and to ask Mr. Negretti in all plainness, whether we are to understand from his letter, published in the last number of this Journal, that the process by which he makes his transparencies has been divulged? For our part we have always been under the impression that Mr. Negretti aspires to be a first-rate producer of photographs, but does not profess to communicate all his information. If such be the fact, it is a pity that his followers should puzzle themselves over an albumen process which will not in their hands yield results equal to those of the master. Against the employment of that process for negatives we have not one word to say: we were glad to see it reprinted in the Journal, and all that has been advanced on the superior sharpness and durability of the plates in printing is entirely in its favour. Our opposition is directed rather against the employment of pure albumen for transparencies; and unless we are mistaken in our reading of Mr. Negretti's communication (in which case we beg to offer him our apologies), it seems to us that he is doing harm rather than good by bringing the matter forward at the present time, and by advocating a simple albumen process, without detailing any new modes of operating likely to remove the common difficulties.

Some time since we were in conversation with a gentleman of ability and experience, much engaged in commercial photography. The question of transparencies was mooted, and all present were of opinion that up to that time the real secret had not been divulged. How was the peculiar shade of colour to be obtained which is seen and admired in the works of M. Ferrier and M. Soulier? Albumen had long been known, and nearly every one had tried it in all its modifications; but the fact remained that in this country we were still behind our continental brethren. In reply to the above question we advised a trial of Major Russell's tannin process, since published in all the Journals, but at that time only known to a few. Our friend called at the laboratory of King's College about a month or six weeks afterwards, to assure us that his experiments had been crowned with complete success, and that the process was worth any reasonable sum of money in a commercial point of view.

Now we must not be understood to say that anybody who reads Major Russell's pamphlet, now in the press, will be able at once to produce transparencies equal to the best works of M. Ferrier. Of course ingenuity and skill will be necessary in devising modifications; and only in so far as the artist can rival M. Ferrier or Mr. Negretti in these respects will he be in a position to compete with them in the excellence of the work. We affirm, however, that in putting tannin into the hands of the photographer Major Russell gives the key to the difficulty, and that many will take it up and complete what remains. If there are any objections to urge against our remarks, we shall be happy to hear them. We wish the public to be enlightened, and not drawn off from what we believe to be the proper scent; and a vision of numberless individuals groping about in the vexatious details of a pure albumen process suggests that some steps should be taken to prevent so great a waste of time and labour. We have known Mr. Negretti for a long time past, as probably have most others who are concerned with thermometers and graduations of all kinds: he will therefore permit us to speak our mind freely, and to propose that he should make application for an evening at the Photographic Society's rooms, and go carefully through the process by which he produced his Java pictures. If he allows the matter to remain as it at present stands, and contents himself by putting forth a mere skeleton process requiring so much clothing and filling up, he will be answerable for all the disappointments of the thousand and one amateurs and professionals who, on the strength of his published successes, will weary themselves in the vain attempt to rival their teacher. Our own impression is that Mr. Negretti will be obliged to give way, and that he will fail to put forward anything equal in simplicity and certainty to the tannin; but, if otherwise, we shall still have cause for congratulation that we have induced him to come forward.

It will, perhaps, be expected that, having undertaken an article on this subject, we should complete it by a full discussion of the rules to be observed in obtaining the true colour by the tannin process. This matter, however, may be more conveniently left in the hands of the inventor; and it will suffice if we notice two or three points which have turned up in our own experience. The tone that strikes us as the most agreeable is a warm sepia brown, removed from yellowness on the one hand and from inkiness on the other. If the image be too grey and metallic in the first instance it is an objection, and we have found that the condition of the collodion has much to do with this defect. Anything which causes a highly powdery state of collodion tends to diminish the proper redness of the image, because, as stated in a previous paper on collodion for dry processes, the particles of the iodide of silver are then less intimately related to the pyroxyline, lying more on its surface, and thus losing much of the intensity which the organic reactions of the pyroxyline are calculated to produce. We think, therefore, that those who wish to study the process carefully, and to make it their business to excel, will not act wisely in choosing collodions at random, or in mixing various sorts together in one

bottle; but will select a particular formula and adhere to it, adjusting the quantities of tannin, of the different acids, and of the nitrate of silver, accordingly. We were made very sensible of the importance of this rule in introducing the *glycyrrhizine* process, for a very few trials served to show that a matter so trivial as the use of a little methylated spirit in place of pure spirit sufficed to alter the colour. Tannin is less changeable than glycyrrhizine, and better in every way: nevertheless we are still disposed to remember that some samples of methylated spirit (probably not all) will give a grey metallic tone to the image in a case where pure spirit produces a red tone; and that collodion made from methylated ether may become powdery and rotten more quickly than that from pure ether, apparently from its containing oxidisable matter, and being more prone to the formation of a body resembling acetic ether in its property of disintegrating gun-cotton. This, we think, will explain the powdery condition spoken of by Major Russell as common in old collodion, *even when iodised with the cadmium salt.* In our practice it never occurs; and the older the collodion, in reason, the redder and more vigorous is the picture. We are not disposed to advocate the use of a pure cadmium collodion in printing stereoscopic transparencies. Something, of course, will depend upon the gun-cotton; but as a rule it seems to us that a trifling amount of decomposition under the influence of the base of the iodide is an assistance in obtaining the colour, and that iodide of *ammonium* may suitably be added in convenient proportions. All these points must be borne in mind, and others even more minute, such as the application of a preliminary coating of gelatine to the glass, which we have found slightly to increase the redness when it is deficient from any cause.

[By a mistake as to the day of publication, the last number of the "Comments" (No XXIII) was not sent in time to receive a proof for correction: hence a verbal error in the first paragraph, which will be quite obvious to the reader.]

SOME REMARKS ON MOUNTING STEREOGRAPHS.

By the Editor.

It is easier to enunciate a principle than to lay down a simple rule of action that shall be applicable to all cases. On a recent occasion we made an assertion to the effect that corresponding points in a pair of stereographs, viewed through a whole-lens stereoscope, should be placed at such distance apart as equals that between the eyes of the observer; but, if viewed through a prismatic stereoscope, the separation of the corresponding pictorial points should be augmented by the amount of lateral displacement. Now, there being two variable quantities involved—viz., the width between the eyes of different observers and the lateral displacement of rays by the prisms used—it is necessary to ascertain something like an approach to an average of the amount of these inconstant quantities, and, after careful consideration of the matter, we fixed it at 2·75 inches. Since the receipt of a note which we have published, we have measured the distance under discussion in a large collection of Wilson's gems, which we fortunately possess, remembering that when they are viewed in one of Smith, Beck, and Beck's achromatic stereoscopes we personally find that they produce an effect suggestive of natural size and distant view. We find the distance between similar points very constant, and that it is 2·8 inches, differing only *five-hundredths* of an inch from the standard which we had adopted—a tolerably satisfactory corroboration of our calculations.

Now, the distance between the corresponding points in *the negative* taken by a bi-lens camera has nothing to do with the mounting, seeing that it is needful to transpose the two sections; consequently, it is the aggregate amount of subject on the *right and left sides* respectively of the selected corresponding points in the negative that affects the mounting, and not the portion originally between them.

We may incidently remark that it is a great error ever to *vignette* subjects intended to be viewed in the stereoscope, for not only is the apparent reality of the object inspected, materially degraded, but we deprive ourselves of one means of increasing the pleasing illusion of distance.

As the field of view in a stereograph is necessarily more contracted than in nature, the illusive effect produced is improved by so mounting the pair that we may appear to be regarding the view *through an aperture* not very distant, which limits the amount of subject seen. In such a case actually occurring, the right eye can see rather more of the left side of the view and rather less of the right side than can be observed with the left eye, and *vice versa*. To give an illustration:—Suppose we are standing near a small window, looking into a garden, and perceive in the centre a fountain, and an avenue of trees, at regular intervals, stretching away from the fountain on either hand. Now, if we close the left eye, keeping the head still, we find that the vista includes three trees on the right side of the fountain and four on its left side. Now, on opening the left and closing the right eye, still keeping the head in the same position, we find that the left side of the fountain has but three trees visible between it and the window frame, while there are four in the space on the right side.

It is therefore clear that—although the right and left pictures each include the same amount of subject—though eight trees are visible to the observer only seven of them are seen by either eye. Therefore, if in mounting our stereographs we bear this fact in mind, and cut our pictures in accordance with this principle, we materially improve the illusory effect; because then our mounting card (which should be of an unobtrusive hue, such as black, grey, or drab) acts like a diaphragm, appearing near at hand, while the landscape in the photograph seems to recede from the spectator.

Now for the application.

We will assume that $2\frac{3}{4}$ inches is our intended distance between corresponding points of the pair of pictures when mounted. Let

a	R b	L	c

represent a negative taken by a bi-lens camera on R and L, the corresponding points. We must cut the proof so that the distance a R, added to L c, will together make exactly $2\frac{3}{4}$ inches; but it is also needful, at the same time, to arrange so that the distance a R is greater than b L, and that $a\ b$ and $b\ c$ are equal. The amount of variation is of minor importance; but if too great, say exceeding a quarter of an inch, the effect will not be pleasing. The above precautions also involve the fact that R b is less than L c.

In conclusion, we will observe that it is not needful that the sum of a R and L c should amount to $2\frac{3}{4}$ inches, provided that it does not exceed it, *and* that, when transposed, a space be left between the margins a and c (which will then be contiguous), so that the points L and R are exactly $2\frac{3}{4}$ inches apart.

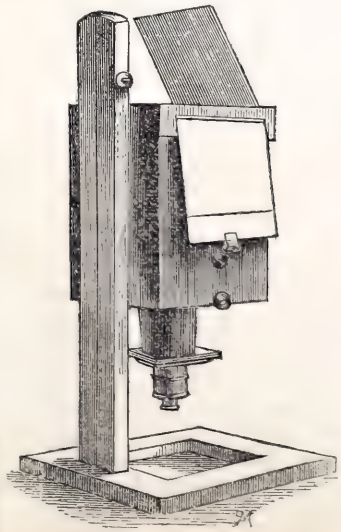
VERTICAL CAMERA FOR COPYING.

By J. Barnett,

Honorary Secretary of the North London Photographic Association.

[Read at a Meeting of the North London Photographic Association, May 29, 1861.]

The idea of making a vertical camera was first suggested to me about twelve months ago, on seeing Mr. W. Hislop attach a portrait camera to the ordinary stand for the purpose of copying geological specimens. The object I then had in view was to produce slides for the magic lantern which should be worthy of our times; and as many of the subjects I desired to possess were prints bound up in different books, I was quite at a loss as to the best means of copying them. Many were too large, others too small, and it was essential to have uniformity in size. A book could not be conveniently fastened against a wall or screen; and, if it could, the grain of the paper was so strongly marked by the side light upon it that it became visible in the negative, and, of course, was reproduced in the printing. The same objection as to fixture applied to plaster medallions, coins, crystals, &c., &c.



I therefore made the camera before you: it is simple, easy of adjustment, perfectly rigid; and, when a print is once correctly focussed, any number of other prints of the same dimensions may be copied, without alteration of camera arrangement, or the slightest chance of the negatives being out of focus. It admits of extension to *twenty-two* inches, and will slide into the body so as to bring the lens within *eleven* inches of the glass screen, so that the object to be copied (if a lens of five and a-half inches focal length be used) can be increased to three diameters, or reduced to two-thirds of its original size; and should it be necessary to reduce a large object, it can be placed below the stand, which is left open at the bottom, or it may be used in the ordinary horizontal manner, in which form it is useful in copying glass positives and other transparent pictures.

The arrangement consists of two perpendicular uprights, fitted in a frame at right angles. Attached to the back of the camera is a slip of oak that runs in a V groove in the uprights, and to fix it in any desired part a screw bolt and nut is provided, which clenches it so firmly that no ordinary pressure will remove it. The inner or sliding box of the camera is similar to that in general use, with the exception of being lengthened by a tube, with the lens attached, or rather sliding in a V groove at its base, so as to admit other lenses, or a combination, according to the work to be done.

The manner of focussing is thus performed:—if the object is to be enlarged, draw out the tube to some extent, and fix with one of the side screws, of which there are six—three on each side; then draw up or lower the camera on the uprights until the focus is clear: if not large enough, draw the tube out further, fixing as before, and so proceed until the exact size and desired sharpness is obtained, then fix in position by the screw bolt at the top. If it should be necessary the fine adjustment of the lens can now be used. To reduce an object I find it best to slide the tube up to its full extent, and draw out if necessary.

You will perceive there is but one slide, and that the dark one: it carries the ground-glass, which is removed for the prepared plate to take its place. One great advantage in this is the certainty of obtaining a picture in the exact focus it appeared on the screen; and, however carelessly the apparatus may have been made, you will not experience the annoyance so often felt at finding your picture less sharp when taken than it appeared on the ground-glass.

I am desirous it should be distinctly understood that I make no claim to originality in the formation of this camera. I have only done a little towards maturing the method adopted by Mr. Hislop; and should any friends feel disposed to follow out the *principle* here adopted for copying purposes, they will find an immense saving of time, and I doubt not we shall have some pleasing results placed upon the table at our next meeting.

THE PHOTO-LITHOGRAPHIC PROCESS OF MR. JOHN WALTER OSBORNE, OF MELBOURNE.

In our number for the 1st ultimo, our coadjutor, Mr. Hardwich, drew our attention to the fact that the details of this process have never been given in this Journal *in extenso*, although we have more than once alluded to the distinguishing principle involved therein. The fact is, we have been for the last seven or eight months waiting for space, and although the article has been so long in our possession, the opportunity sought for has not yet arrived. We fear, therefore, that we have scarcely done that justice to Mr. Osborne which his valuable labours merit; and in order no longer to delay, and yet not encroach too far upon other pressing matter, we extract the following from Mr. Osborne's article, which was read on the 30th of November, 1859, at the Philosophical Institute of Victoria:—

"Photographic science has of late years made such astonishing progress that it has stimulated the inventive genius of scientific men, awakening in them the very natural wish to make its many advantages applicable to the several graphic arts. The result has been the more or less perfect development of a number of processes bearing directly upon the reproduction of works of art.

"Thus the application of photography to engravings has been the object of Mr. Fox Talbot's exertions; Niépce de St. Victor and Mr. Pretsch are also working in the same direction; while several gentlemen, of whom I shall subsequently speak at greater length, have turned their attention to photo-lithography.

"It is not my intention to undertake the description and criticism of the majority of these important inventions, save as far as they stand in close relationship to the subject of this paper. The invention I have been fortunate enough to make belongs to the latter class, and I shall describe it as concisely as possible, and then proceed to compare its capabilities with other photo-lithographic methods.

"To prevent misconception it may, perhaps, be well to state that the manipulations I am about to describe are only such as aid the lithographer in producing one particular kind of work, namely, that which is printed from smooth stones. My process, in the form I shall give it in this paper, is chiefly applicable to the reproduction of drawings formed of hard defined lines, such as maps, pen-and-ink sketches, and important documents; and less so to photographic views of landscapes, portraits, or Indian-ink drawings, composed of tints and shades; and although the former class may not be as interesting and attractive a study as the latter, yet I believe it to be of equal, if not superior, practical value. Circumstances have caused me to turn my attention more particularly to the reproduction of maps and plans, and I wish it to be understood that my remarks on this occasion bear reference to that description of work.

"It is generally the case that the scale on which a map is drawn by the surveyor of a district is very much larger than that which would be wisely selected for publishing his map, inasmuch as the details become too minute and tedious, and would take him more time than should be expended upon one copy, if he were to draw upon the usual publishing size; the consequence is that his plan must be reduced before it is engraved or drawn upon stone. This process of reduction is more or less troublesome, as the map contains more or less work when it is accomplished in the old way; but by photographic means it is a matter of the utmost indifference whether the original be crowded or not. The application of photography to reducing maps was introduced into the Ordnance department of Great Britain in the year 1855, by Colonel James, with perfect success.

"To proceed a step further, and imprint such a reduction directly upon the stone in such a way that common lithographs can be printed from it, is the problem the photo-lithographer has to solve.

"Without entering too minutely upon a description of the manipulatory details peculiar to my process, I shall simply give a concise account of the several operations, so far as they are of scientific interest.

"In the first instance, a sheet of paper is prepared with albumen in the usual way known to photographers; when quite dry, it is passed through a copperplate or lithographic press, upon a polished steel or copper plate, by which operation it receives a very smooth and regular surface; it is then coated on the same side with a solution of gelatine to which an addition of bichromate of potash has been made; this is then carefully dried in the dark, and again passed through the press to ensure the finest surface. This operation completes the preparation of what I shall call the sensitive paper. Having made a negative of the original map bearing the desired proportions to it, I place a suitable piece of the sensitive paper just described under and in close contact with the map, and the whole is exposed to daylight in such a way that the luminous influence passing through the transparent parts of the negative shall strike directly upon the prepared surface, while the greater part of the paper is protected from its influence by the dark parts of the negative, which correspond to the white places on the original map. In the presence of the organic matter, the actinic agency effects the decomposition of the bichromate of potash, and the liberated nascent oxygen in all probability reacts upon the gelatine, altering its chemical characteristics in a peculiar manner. The visible effect, after removing the negative, is the formation of a picture in brown upon the clear yellow of the paper, corresponding to the transparent portions of the negative, or to the black lines upon the original drawing.

"This positive photographic print is next covered with an even coating of lithographic transfer ink, by passing it through the press, face downwards, upon an inked-in lithographic stone. The pressure causes the whole of the sensitive surface to lay hold of the ink, and bear away with it an even coating, hiding the brown photographic positive from view. The altered parts of the gelatine which have been exposed to the luminous action appear to be possessed of a certain amount of affinity for the grease of the ink, so that they will be found to retain it with considerable tenacity.

"The next operation is to coagulate the albumen which still exists under the prepared surface. This is done by floating it upon boiling water, with the paper side downwards. A subsequent soaking for a short time causes the unaltered gelatine to swell in such a way as to raise the ink with it from the paper, and a slight amount of friction, with a sponge or other soft substance, removes the superfluous ink from all parts of the inked print which correspond to the white parts on the original document. When all the lines appear clear and well-defined, boiling water is poured over the whole to remove the last traces of gelatine, and the print is dried. We are now possessed of a *bonâ fide* lithographic transfer—that is, a drawing in greasy ink, of such a nature that it admits of being transferred to the stone in the ordinary manner, by simply inverting it thereon, and passing it through the press, the albumen, which will be found to have withstood all the washing, acting as the adhesive substance under the ink, to prevent the paper from slipping on the stone.

"The whole of these operations need not occupy more than from two to three hours."

Such was the process as worked by Mr. Osborne in 1859, and we have on several former occasions expressed our conviction that the preceding is certainly the most valuable process for its intended

purpose that has yet been suggested, not excepting that of Colonel James; but we understand that latterly several improvements and simplifications have been introduced into some of the manipulatory details which we hope, in due course, to be able to lay before our readers. The concluding part of the original paper consists principally of a review of what had been done by other operators in this field of photographic research, and an indication of the special points of advantage claimed by the author for his method of proceeding; but as we have before advocated them, it is unnecessary to repeat them here.

ON A NEW METHOD OF PRODUCING ON GLASS PHOTOGRAPHS OR OTHER PICTURES, IN ENAMEL COLOURS.

By F. Joubert.

[Read before the Society of Arts, May 22nd, 1861.]

Of all the inventions to which the genius of man has given birth, and which have been progressively developed and brought, by his industry, to a high degree of perfection and usefulness, the art of glass-making is certainly one of the most interesting and extraordinary. At the same time it is doubtless one which has tended to increase our comforts and our enjoyments in a degree almost unequalled by any other discovery of modern civilisation.

If we look back to the dark ages, and find that in those days even the rulers of the earth had no means of keeping rain and bad weather from their habitations, except by also shutting out the light, we shall be ready to acknowledge the astonishing results, as compared with the present state of things around us, which the persevering efforts of man have, under the guidance of an ever-merciful Providence, been able to accomplish.

Before entering into the description of the process which is more immediately the subject of our meeting this evening, I would, in a concise manner, and, as far as the necessarily limited time I have to occupy this place will allow me, recapitulate the history and progress of the invention of glass itself, and of glass painting, which has led to the process before us.

We have no distinct evidence to show what nation first used glass, and we must therefore be satisfied with the various traditions transmitted to us, from age to age, on the subject. One fact, however, seems established beyond the possibility of a doubt, viz., that the greatest antiquity can be assigned to this invention, since the Egyptians and the Phœnicians had both vessels and ornaments made of glass, crude in form, but of a substance so perfect, by whatever means obtained, that it has stood the trial of several thousand years, and may be pronounced to have suffered no deterioration. Might we not, in consequence, assign to glass a place in the list of useful inventions far higher than that which it occupies; for in this we have a discovery, the first inventors of which seem to have attained, at once, the very condition—durability—which humankind is incessantly bent upon obtaining for any produce of its hands.

But, still more remote is the mention of glass in the Holy Scripture; for, if the interpretation of the text be a correct one, in the 18th chapter of Job, as also in several other parts of the Bible, is found an allusion to a substance which we imagine must have been glass. Next to this, Alexander Aphrodisius amongst the ancient Greeks, Lucretius, Flavius Vopiscus, and other Latin authors, have left us a correct description of glass. Aristophanes also alludes to glass in one of his plays, and Aristotle brings out two problems on the subject: the first, Why is it we see through glass? the second, Why can we not bend glass?

Admitting that these two propositions emanate from the celebrated philosopher, they appear to give conclusive evidence that glass was familiar to the Greeks.

But we may, perhaps, even trace the origin of this invention far earlier, and to the remotest period of the existence of man, by associating it with the art of making bricks, which was, it is believed, practised by the earliest inhabitants of the earth; and it is not difficult to imagine how such an art would originate.

Man was led, for his subsistence, to seek a mode of preparing animal food for his use by roasting it over the fire; and having, in course of time, built, rudely, a sort of oven made of earth, and the earth having become hardened through the action of the fire, our forefathers would soon discover all the advantages which might be derived from such a process for making bricks or pots, and utensils for common use. Specimens of the potter's art in ancient times we have plenty, and in a variety of forms or shapes, which for elegance have not been surpassed. We need only allude to the Etruscan vases in the collection of the British Museum.

In firing bricks it will not unfrequently happen that some kind of vitrification takes place in the bricks placed in the most violent part of the fire; and one might naturally suppose that one process would lead to the other, but such does not appear to have been the case, at any rate, for many centuries. Later, horn and skins were in use down to the third or fourth centuries of the Christan era, and oiled paper or mica were also used in lieu of window glass nearly up to the time of the reign of Elizabeth. If we are to give credence to the narrative of Pliny, to accident alone, as in many other instances, we should be indebted for the discovery of glass:—Some traders, being weatherbound, landed on the banks of a river in Syria, and began to dispose a place in the sand for cooking their meals, after having gathered for fuel a great quantity of an herb, known there by the name of *kali*, which plant must have contained a large proportion of carbonate of soda, and this being mixed with the sand, yielded, through the agency of the fire, a sort of vitreous substance. Such is one of the accredited versions of the origin of glass.

Glass has at all times, until recently, been thought a substance of great importance; and even amongst the primitive inhabitants of South America and of the Indian continent—who were, when first visited by the early European navigators, found to possess gold and silver ornaments in abundance—it is well known that the first discoverers of those countries who happened to land in search of food or for water had no difficulty in obtaining from the natives gold in exchange for some valueless pieces of glass, or a few glass beads, which they would immediately use as an ornament round their neck or their wrist. As late as the middle of the last century, glass beads of various descriptions and of all sorts of colours were extensively manufactured in France, principally for exportation to the colonies of South America and the islands of the Pacific Ocean.

It may be said that although glass is an article of first-rate necessity to us, it is at the same time one with the nature of which very few persons are well acquainted; and the learned have even been often at variance as to the exact classification glass ought to belong to. It is not a mineral, since it has never been found in a primitive state in any country; neither can it be placed in the vegetal kingdom, although one of its most important parts—the alkaline—is undoubtedly a vegetal.

Glass has become with us an article so singularly cheap and common, that we are apt to lose sight of its immensely diversified qualities; but, if only considered from a philosophical point of view, we shall find that few of the substances which we have in daily use, either in a simple or compound state, can be compared to glass in point of importance and of usefulness. Firstly, unlike any mineral, it is inodorous and clean to the fingers, and does not lose any of its weight by usage or wear; it is always transparent, whether in a cold or a red-hot state; it can take any shape whatever while in a state of fusion, and it retains it absolutely after it has cooled. It is capable of receiving the highest polish, and of taking any coloured tint, either on its surface or in its body; and it also has this peculiar and invaluable advantage, that it does not retain any taste of any liquid or acid it may have contained. It is the most flexible of substances while in fusion, and becomes harder than any pure metal when once it has become cold. Lastly, it is not liable to rust, nor to be consumed by fire.

The innumerable applications of glass are such now, that it is difficult to imagine any one branch of industry or of manufacture which could be carried on a single day without the use of glass in one shape or another. To some of the most important amongst the sciences, such as chemistry, physics, and astronomy, the use of glass is a matter of absolute necessity; and in proportion to the gradual and increasing requirement of those last-named sciences, especially astronomy, it will be found that the glass manufacturer has been obliged to perfect his mode of manipulation, and, by the aid of chemistry, has of late years obtained such magnificent results, that the field for astronomical observations has thereby been considerably enlarged.

It appears that, although vessels made of glass had been in use for a considerable time previously, it was only about the third century of our era that glass began to be used for glazing windows. These consisted in an infinite number of small panes of various shapes, which were arranged so as to form certain designs for the ornamenting of windows in places of worship—glass having, on account of its rarity then, been almost, if not entirely, confined to that use.

St. Jerome, who wrote in the fourth century, speaks of glass in church windows; and Gregoire de Tours relates, two hundred years later, in the year 525, that a soldier of the army of the King of the Visigoths, which had invaded Auvergne, entered into a church through a window, of which he broke the glass. Fortunat, Bishop of Poictiers, towards the end of the seventh century, describes with admiration the painted windows of the Cathedral of Paris. St. Philibert, also in the seventh century, had the windows of the celebrated Abbey of Jumuges, on the banks of the Seine, near Rouen, decorated with glass.

In the beginning of the eighth century glass was unknown in England, and it was Wilfrid, Bishop of York, who died in 709, who first introduced glass into England, by sending for some glass-makers from France, according to a record kept to this day. A few years later, St. Bennett, Abbot of Wearmouth, wishing to decorate the windows of his monastery, sent for some glass-makers, also from France; for it appears from some authentic records, that the art of decorating windows with glass was practised in several parts of France, especially in Normandy, long before it became adopted in other countries.

It would seem that the art of staining glass was very early discovered, although no date can be correctly assigned to the period when stained glass for church windows was first used. The practice generally adopted was to make a sort of mosaïque design, by placing an infinite number of small pieces of coloured glass together. This was in use for several centuries before the art of painting on glass, properly speaking, was discovered, which seems to have soon extensively spread, and was cultivated by many excellent artists, if we may judge from the numerous specimens yet in existence on the Continent. But to the sixteenth century, so rich already in artistic talent, was reserved the glory of carrying glass painting to a degree of excellence which has never been equalled

since; and the names of Jean Cousin and Bernard de Palissy will be honoured for ever amongst the large phalanx of glass painters in all countries. The most remarkable, perhaps, of painted windows in this country, are the windows of the various Colleges at Oxford, which were executed during the seventeenth century by Bernard Van Linge and his pupils. William Price also repaired some of the glass paintings in Queen's College, Oxford, and in Christ Church painted a remarkable composition from the designs of Sir James Thornhill. Besides these may be mentioned the windows of Lichfield Cathedral, and several other very ancient windows in Christ Church College, and especially in the residence of the Dean of Westminster, near the Abbey.

Having been, for many years, professionally acquainted with printing in connexion with the fine arts, and having observed the immense development the new art of photography has taken, and the large field it has opened for representing all sorts of subjects, of animated as well as still life, it occurred to me that if a means could be found to print the photographic image on glass, as easily as it is done on paper, and through the agency of some chemical composition which would admit of employing ceramic or vitrifiable colours, and burning them in, a great result would be attained, and a new and considerable branch of industrial art might thereby be opened. Considering the numerous and various attempts which have, from time to time, been made to introduce a substitute for glass painting in the decoration of houses, I believe it can be said that a want was generally felt for supplying the growing taste for pictorial decoration; for glass painting is an expensive process, and requires also a considerable time to obtain a perfect result. There is a process known as lithophany or diaphany, or transparent china, on biscuit slabs, which are now made in Germany principally, and some very good specimens can be seen; but although any kind of subjects, on a small scale, can thus be represented, and with a very good effect, the slabs are heavy and thick, and can never come into use as a substitute for glass painting. Some few years ago a new mode, which was then termed "potichomany," was introduced, which had for a short time very great success. I allude to the mode of pasting coloured prints inside a large glass bowl or jar, and applying a thin layer of plaster of Paris, in a liquid state, so as to fix the paper firmly, and create an opaque background, by giving substance to the whole, when seen from a distance. Some very good specimens of this were obtained, and it afforded for a time an agreeable occupation to many a young lady. Another mode has also been tried, and some very pretty results produced, by applying prints obtained by lithochromy, or lithographic printing in colours, on a pane of glass, and varnishing them at the back with copal or some such varnish: these will for some time resist the effects of the weather when placed in a window, and this is perhaps the nearest approach to glass painting in point of effect yet achieved; but, practically, it does not answer, for the varnish will not stand exposure to the weather from outside, and the constant cleaning glass requires renders it liable to be injured, and the image will soon perish.

In the mode which is for the first time introduced no such danger or liability need be feared, since the colour has been firmly fixed in the substance of the glass by fire, and, being composed of the same elementary materials, has become part of the glass itself, and can only be destroyed by the glass being annihilated by breakage.

In order that the process may be very distinctly understood, I shall now describe it by reading that part of my specification which relates to the placing the image on the glass, fixing it, and passing it through the fire.

This invention has for its object improvements in reproducing photographic and other pictures, engravings, prints, devices, and designs, on the surfaces of glass, ceramic, and other substances requiring to be fired to fix the same thereon.

For this purpose, I proceed in the following way:—A piece of glass, which may be crown or flatted glass, being selected as free from defect as possible, is firstly well cleaned, and held horizontally while a certain liquid is poured on it. This liquid is composed of—

Saturated solution of bichromate of ammonia.....	5 parts.
Honey.....	3 ,,
Albumen.....	3 ,,
Distilled water .....20 to 30	,,

Well mixed together.

The whole carefully filtered before using. The preparation of the solution, and the mixing up with other ingredients, should be conducted in a room from which light is partially excluded, or under yellow light, the same as in photographic operating rooms, so that the sensitiveness of the solution may not be diminished or destroyed.

In order to obtain a perfect transfer of the image to be reproduced, the piece of glass coated with the solution, which has been properly dried by means of a gas stove (this will only occupy a few minutes), is placed, face downwards, on the subject to be copied, in an ordinary pressure frame, such as is used for printing photographs.

The subject must be *a positive picture* on glass, or else on paper rendered transparent by waxing or other mode, and an exposure to the light will, in a few seconds, according to the state of the weather, show, on removing the coated glass from the pressure frame, a faintly indicated picture in a negative condition. To bring it out, an enamel colour, in a very finely divided powder, is gently rubbed over with a soft brush until the whole composition or subject appears in a perfect positive form. It is then fixed by alcohol, in which a small quantity of acid, either nitric or acetic, has been mixed, being poured over the whole surface, and drained off at one corner.

When the alcohol has completely evaporated, which will generally be the case in a very short time, the glass is quietly immersed horizontally in a large pan of clean water, and left until the chromic solution has dissolved off, and that nothing remains besides the enamel colour on the glass; it is therefore allowed to dry by itself near a heated stove, and, when dry, is ready to be placed in the kiln for firing.

It may be stated that enamel of any colour can be used, and that by careful registering a variety of colours can be printed one after the other, so as to obtain a perfect imitation of a picture; also, the borders of any description can be subsequently added, such as those shown in the specimens on the table, without any liability to remove or even diminish the intensity of the colour in the first firing.

It will be easy to perceive that this mode of obtaining an image on glass, in an absolutely permanent substance, and of any description, colour, or size, may prove of considerable advantage and utility for the decoration of private houses and also for public buildings. Now that, through means of the photographic art, the most correct views of any object or of any building or scene—even portraits—can be faithfully and easily obtained; when we see every day the results of the labours of photographers in all parts of the world, in the shape of beautiful prints; when we can be made acquainted, without leaving home, with the actual costume, habitations, scenery, manners almost, of all countries, for instance China and Japan, which have but recently opened their doors to European civilisation; when, through the same means, we are able to see, for the first time, and the learned are able to translate from, the graphic reproduction with which photography furnishes us of those early inscriptions engraved on the rocks in Asia, and by the Egyptians on their splendid monuments—I need only point out the usefulness of the mode of fixing those images, in an indelible manner for ornamental as well as scientific purposes.

In large cities like London, where houses are built so close to one another, in how many places may not the process become available by enabling anyone to introduce, for a very moderate expense, pleasing or instructive images where common plain ground glass is now used, to shut out the sight of a disagreeable object, a dead wall or an unpleasant neighbour, without diminishing the amount of light more than is convenient.

In the library, fitting subjects might be introduced on the windows by a judicious selection of the portraits of favourite authors, or of famous scenery at home or abroad. In the dining room, also, appropriate pictures could be selected, such as flowers, fruits, or game subjects, so disposed as to harmonise with the decoration of the room. Even for domestic purposes, for lamps, or screens, or any object of glass, the process will be found useful, principally on account of its rapidity, which will enable the manufacturer to execute and to deliver an order at a very few days' notice.

At the conclusion of the lecture, in answer to various questions put to M. Joubert, he stated that THE SIZE of his productions was only governed by the limit at which good photographs could be produced, and by the size of the furnaces used for "firing" the pictures into the glass; but at the present moment a picture might be made up to three or four feet square. As to *the number of colours* that could be employed in one picture, he had only as yet attempted mono-chromes for the pictures themselves; but he had introduced various colours into the designs of the borders, and had therein obtained four colours on one glass plate. As his object was to produce *cheap permanent artistic designs on glass*, he had confined himself to monochromes; for, by introducing numerous colours into a picture, he would have to return to the old and expensive method of the glass painters, viz., tinting in and firing each colour separately, and would thus pass into glass painting proper. With regard to THE RISK incurred, it would increase in proportion to the increase in the magnitude of the plate employed, and also according to the number of colours introduced into a design; for they might secure three of the colours with safety, and whilst "firing" the fourth the glass might be fractured. Whilst his *failures* had in his early experiments been at least fifty per cent., they had been, during the last three months, with increased experience, under five per cent. With regard to THE COST of his process, he had estimated that pictures on glass could be produced from 8s. per square foot, the price increasing, however, with the size of the glass plate, and consequent risk of breakage.

FORMIC ACID ACCELERATOR.—We learn from the *Bulletin* of the French Photographic Society that MM. Ferrier, Sons, and Soulier, at a recent meeting introduced a number of stereoscopic views of Paris, obtained, they stated, by absolute instantaneous exposure, whereby people, horses, carriages, &c., were represented in motion. M. Ferrier informed the meeting that the only peculiarity in the process he employed was the addition of a small quantity of formic* acid to the nitrate of silver bath (not to the iron developing solution, as stated by the "Paris Correspondent" of a contemporary) to which the great sensibility of the plates employed was due. The lenses employed were Dallmeyer's new stereoscopic combination.

*We consider this mode of application an error, formic acid being a reducing agent. Mr. Maxwell Lyte was, we believe, the first to employ formic acid in photography.—ED.

SHARPNESS—WHAT IS IT?

By A. H. Wall.

[Read at a meeting of the South London Photographic Society, May 16, 1861.]

If frequent use could wear out a word, where would that poor little word "sharpness" be? No quality has been more lauded, few more frequently denounced than that which has been held by photographers to be represented in this word. Sharpness has influenced the labours of our opticians, chemists, and manipulators; to its attainment far higher and more important qualities have been ruthlessly sacrificed; and it must certainly have seemed to many that if there was one thing above all others for which photography was providentially created, that one thing was sharpness.

I must admit that I do not like the word: it has become associated in my mind with hardness and flatness, with a dull monotonous surface cut up into paltry little sections by sharp outlines, and the unpleasant and unnatural obtrusiveness of minute details. I have more than once expressed my feelings about it in the journals; have smiled with a sensation of gratified malice when it has been severely handled; have given it a vigorous dig in private conversation when I got the chance; and altogether have been anything but its friend and supporter. Having done all which, I begin at length to suspect that the poor thing which has received so much ill-usage at my hands is, after all, a very worthy, good, and excellent friend of mine, deserving far different treatment. Not, however, being *quite* sure that my suspicions as to the character of this quality are justified, and not being the happy possessor of great scientific attainments myself, I come down to our pleasant meeting this evening with a few words about sharpness, written with the sole intention of inquiring from the scientific and experienced of our little fraternity—*What is it?*

In bringing forward this subject, however, I feel, to use the words of a friend of mine, that it is a difficult one to deal with, "because no one has ever fairly committed himself as to what sharpness really is, so that when you attempt to seize the fellow in one shape, *presto!* he assumes another, denies that he ever was anything else than that he is, and protests that everybody's common sense knew him to be that." I shall presently show you that for want of a clear definition of this little word, much misunderstanding has divided artists and photographers; and to prove that the definition I ask for is not altogether so needless as some amongst us may think, I shall refer to such authorities as *Sir William Newton, Messrs. Buss, Leighton, H. Cooke, Rothwell, Lake Price, Professor Hunt, and Mr. Sutton;* assuring you that to these I might easily have added a dozen or two more of good authorities, if I had possessed the necessary leisure to hunt out references.

I have been associated with photographers for nine or ten years, although my own *practical* experience in this delightful art dates from a more recent period. I have mingled with photographers, and discussed photography in many parts of England, and with operators of different degrees of merit, and of varied attainments in both photography, science, and art; and it is from convictions thus strengthened that I feel this question of sharpness ought to be definitely settled.

The optician will, I suppose, define sharpness as "the perfect representation of a point by a point." The photographer, I know, frequently defines hardness as sharpness. And the artist is too apt to take the term for what it is worth in the dictionary, without due reference to its technical meaning.

I suppose sharpness really means the perfect definition of an object in focus. If this be true, what constitutes *perfect* definition? By what standard are we to judge its perfection? By the definition given in the image upon the healthy eye's retina, or that produced by an optical arrangement of glasses which gives the most clearly and distinctly visible view of every minute detail in the natural object? One lens will produce a sharper picture than another, and again by decreasing the aperture we can increase the sharpness; but what is the standard we are to set up for our guide in this matter? for unless we seek sharpness merely for the sake of sharpness, some standard of perfection we must or ought most certainly to possess.

It will show pretty clearly in what spirit this matter has been discussed by photographers and artists if I refer back to the first volume of the *Journal of the Photographic Society*. We there find that at the first ordinary meeting of that body, Sir William J. Newton, Vice-President, being both an artist and a photographer, read a paper *Upon Photography in an Artistic View, and in its Relation to the Arts*. In this paper its author, while regretting that photography had not then realised the truths of atmospherical perspective, pointed out, as a course for the photographer to pursue, the devising and discovering of means by which pictures might be produced "*still more minute and perfect in detail*," without, however, forgetting "that his subjects are principally natural objects, powerfully acted upon by atmospheric influence." Sir William Newton wanted, in short, more "*gradation*," and less "*flatness*," and I think every *artist*-photographer of the present day must acknowledge that this—speaking generally—is a want still to be supplied. In the course of his paper, however, Sir William observed that, for the purpose of the painter only, and as "*private studies*," a "greater breadth of effect" would be attained if the photograph was taken "*a little out of focus.*"

Now the great aim of the painter has always been to secure for his compositions that harmonious unity of parts which constitutes a perfect whole; and not only are crude spots or patches of light, dark, or colour destructive of this, but sharp edges and abrupt terminations have an equal tendency to cut up the surface into sections, and so destroy breadth, or, in other words, the unity of parts—separating and dividing instead of uniting; giving you a weak little bit at a time, as it were, instead of coming down upon you at once with the whole strength of well-united forces. For this reason Sir William advised the artist, or the painter, to take his photographs, as studies, "*a little out of focus.*"

Now, the excellent Vice-President's doing this was nothing very terrible; but it seems to have startled the whole photographic world from its propriety. In vain Sir William asserted "he had no intention of advocating the *general* use of this plan," nobody seemed to believe him; and soon after, when the subject was re-opened by two papers, read respectively by Mr. J. Leighton and Mr. R. W. Buss (artists both, I believe), a grand battle-royal came off in the presence of Sir Charles Eastlake, President of the Royal Academy, at the end of which matters remained much the same as they were before they commenced, so far as the actual merits of the question were concerned. Mr. Buss asserted that, by throwing objects out of focus, forms were rendered indistinct, the minute detail or lines destroyed, and nothing left but large masses of light, half-tint, and shade; and Mr. Leighton, that by excess of detail you sacrificed breadth, or, in other words, exactly the same thing. In the discussion that ensued, Sir William remarked that the artist who copied servilely "destroyed the poetry of fine art," and argued that photography, by copying *servilely*, could never reach "the poetry of *Nature*." Mr. Vignoles said the artist, the optician, and the engineer, each viewed these matters in a different light; but although he himself certainly desired more artistic qualities in photographs, he "should as soon think of attempting the adjustment of his eye instead of using a veil, as of throwing the camera out of focus to obtain an effect he could produce by a variety of other means." Mr. Shadbolt referred to the strong party feeling existing on the subject, and stated that he and Sir William Newton differed in toto "as widely as light from darkness." Dr. Percy believed accuracy and minuteness of detail to be perfectly consistent with breadth of effect, and therefore denied the necessity for throwing a picture out of focus. Mr. Henry Cooke, a painter, said "the whole question of whether photography should be a benefit or a bane as an art, hung upon the successful issue of the pending question. He thought focus a scientific rather than an artistic question; but said, if one part of a picture must be sharper than another, that part should certainly contain the principal object or objects. Such was the character of this often-mentioned and very animated discussion, in which, beyond agreeing to disagree, little was done by those present for settling the point at issue.

In reference to the assertion of Mr. Buss, I would remark that the destruction of detail is neither more nor less than the destruction of gradation, upon which real softness and breadth to so large an extent are dependent. I cannot remove detail from any portion of a photographed surface without removing certain of the more delicate tones which unite and blend the half-tints with the highest lights. For instance, suppose I take a brush, and, with indian ink, lay in a broad line, the edges of which are washed softly away into the white paper on either side: if I then take two pieces of straight-edged white paper, lay them one on either side of the line, and gradually bring them closer and closer, until a very fine dark line alone divides them; this line, owing to the removal of the more tender and delicate tones on either side, must then appear sharp and hard. Therefore, I think Mr. Buss was mistaken in supposing "the minute detail or lines" might be destroyed with advantage; and, with reference to Mr. Leighton's remark, I could easily quote expressions from a score of eminent artists of the highest rank, tending to show that in their opinion the most minute perfection of detail was perfectly consistent with a broad artistic effect.

Sir William Newton's objections to the servile copying of the artist I can understand. There are matters of higher importance which should claim all an artist's efforts and time; for such, therefore, to sit down and copy nature servilely, is waste to their precious gifts by indulging in mere mental indolence and self degradation. But surely the more nearly we approach, by a process demanding no such laborious outlay of time and work, the truths of nature, the greater chance we have to embody her spiritual meaning of poetry. Sir William himself inferred the close ties which unite the poetry of art to that of nature.

I have in my own mind some suspicions that the quality which is somewhat commonly regarded by our practical operators as sharpness is neither more nor less than imperfect focus, or, in other words, not sharpness at all. I believe that perfect sharpness or focus tends to destroy outlines, secure gradation, and give perfect modelling. I have frequently seen pictures produced by inferior lenses in which the contours of the features appeared to be bounded by outlines as clear and distinct as if they had been drawn by hand with a fine-pointed pencil—an effect which has been lauded as the very perfection of sharpness, but which I, nevertheless, attribute to the want of that very quality. There are certainly no such outlines in nature; on the contrary, the boundary of vision glides gently from our sight, and dies softly away.

In this view of the case I fancy I am supported by one who, unlike myself, speaks not only from his observation of natural objects, but from a scientific knowledge of optics. Mr. Rothwell stated, in a recent number of The British Journal of Photography, that "he had never yet seen a

photograph possessing that fine and perfect definition which he wished to see attained."

Sharpness, as at present understood, has never been very popular with our best men. Mr. Sutton, speaking of the waxed-paper process, said, in a recent number of the *Notes*, that one of the evils attendant upon the introduction of collodion was that of "exalting the quality of sharpness," and "lowering the appreciation of higher qualities."

Professor Hunt, speaking of this quality, regretted that "intense illumination was so much sought for under the idea of producing the sharpest picture," saying that, although many productions were remarkable for this effect, it was extremely unnatural, because "*the human eye never sees this extraordinary sharpness of outline in nature.* Upon the edges of every object there are fringes of light, which soften off their outlines, and subdue the general tone of objects, blending all harmoniously." Lake Price warmly denounced "the parrot cry of sharpness;"* and, in short, so have very many others equally eminent. But, as I have before said, it is now a question with me whether sharpness or perfect focus is really the quality thus denounced.

Certainly the artists who recommended that the lens be put a little out of focus made a funny mistake. Sir William Newton was *not* one of these; for, as I have shown, he, in his paper, actually advised that efforts be generally directed to the obtaining "*still more minute and perfect detail;*" and I am, therefore, inclined to believe that his ideas *then* were not unlike those I express *now*. A picture out of focus is certainly blurred at the outlines, but it is not less blurred in its lights and shadows; moreover, it is flat and weak, and, altogether, a thoroughly inartistic affair. I do not think with Sir William that it would be good even as an artist's private study; and I am certain that, while it had lost all worth as a photograph, it would be of no more value as a picture.

I have already referred to the control we have over this quality of sharpness by choice of lens, and method of using it. It is therefore of consequence to settle what part of a subject should be focussed for sharpness.

This question will be answered differently, according to the different ends aimed at. For the architect an equality of sharpness distributed over the whole picture will, of course, be most suitable; but the artist will always desire that every attractive quality of a picture should find its focus where the interest of his performance centres. In a portrait, the head, and those features especially which require the most prominence given to them, will be most illuminated, and most carefully wrought out in their details. In a group the principal figure will receive similar treatment; and in a landscape the vigour and force of *chiaroscuro*, as well as the expression of minute detail, will naturally enough occupy the foreground.

In opposition to this, how frequently do we see photographs in which, through the use of a very small diaphragm, the ear and boundary lines of the hair are as sharp and distinct as features which are more important and prominent; or a group, in which we find no more definition secured for the hero of the action represented, than for a figure which acts as the merest accessory to help the story! And in a landscape do we not frequently see that the operator has focussed for the most distant object in his view?

Sharpness should, I therefore venture to assert, be clearly separated from what would be more legitimately called hardness, should be limited in amount, and judiciously secured for that portion of a portrait, landscape, or composition group in which it will have the most pictorial value as focus. I use the word focus here in its artistic sense.

The painter recognises the value of focus throughout his whole work. To secure breadth of light and shade, he obtains a focus of light and a focus of dark—in short, all his effects invariably have their focus. But if the lights were of nearly equal brilliancy all over the surface of his picture, and the darks of nearly equal depth—if no one part of the production was more attractive than another, and an equality of interest pervaded every part of it—if, in short, it had *no focus*, it would be a very poor and miserable affair, devoid of both art and interest. Yet we "stop down" our lenses to the smallest possible aperture, and bring all their powers of focus to bear upon the most distant portions of a view, in order to obtain *no focus*, and so ruin pictorial effect and natural truth. Sharp distances, as evidence of depth of focus, are mistakes only to be equalled by "white skies." Why, nearly all the poetry of nature lies in the exquisite sensations of the broad free air—the home of the glorious sunlight, and the boundless dwelling-place of the fetterless wind; the ocean of the universe, connecting worlds with worlds, and systems with systems: and we are to shut out this mighty element from our beautiful sun-pictures—are to push back our foregrounds, and drag forward our distances, and crowd them into a little white-washed dungeon, for the sake of "sharp distances" and "depth of focus." Truly it wont bear thinking of.

The other day, being with my friend Mr. Simpson, the editor of the *Photographic News*, we were examining the effect of stops upon the image on the ground-glass. I took my station under the focussing cloth, with my eye fixed on the ground-glass screen, and Mr. Simpson changed stops the while. At every change of aperture, beginning with the larger and coming to the smaller, there was a clear distinctive variation in the character of the view, distant objects growing sharper and coming nearer, until at length an almost flat map-like appearance gradually became apparent. *Sharpness was everywhere, focus was nowhere, and space was annihilated.*

If I am not mistaken, Mr. Grubb, in one of the early numbers of the *Photographic News*, referred to this "effect defective," arising from the use of very small apertures; and pointed out, by way of illustration, the images produced by telescopes and microscopes. The moon, seen by the full aperture of a telescope, is in perfect relief, and the prominences on its surface are seen with their cast shadows and real *chiaroscuro;* but if the aperture be reduced by a small diaphragm, although sharper, it then becomes a mere flat circle with a map-like surface.

The presence of atmosphere is always recognised by the English painter, while the English photographer's prime desire seems to be to ignore it. There is no better illustration of the effect of atmosphere upon retiring objects than that of seeing how their colours become affected by it. As the green grass of a field retreats, every few yards change in colour and tone, partaking more and more of that of the atmosphere. So with form, as veil after veil of thin air interposes between us and the object before us, lights grow less powerful, shadows lose their force, and details disappear—the finer and more delicate first, the stronger and bolder last. Perfect detail, brilliancy of light, and depth of shade, are, then, qualities which, falling in their right place on the more near and prominent objects, represent sharpness where sharpness should be, and thus give a *focus* to the view; for it must be clear that, where all parts are equally sharp, there can be no focus.

And so I leave the matter in your hands. I think I shall produce a discussion, and hope I shall benefit by it. It is somewhat bold of me to come forward and tell so many old photographers and scientific men that sharpness isn't sharpness, and focus isn't focus; but I have done it, and must dare the consequences. The fact is, I want to know what sharpness is, and have in reality only gone in a somewhat rambling way about making the very simple inquiry chosen for a title to this unpretending little paper. Before commencing an argument, the first best thing you can do is to define terms; and, having omitted this preliminary, the next best thing you can do is to begin again, without omitting it. And so I end, as I began, with the short question—*Sharpness: What is it?*

* "The parrot cry of 'sharp! sharp!' which the ignorant in art raise, seems the main point aimed at."—Lake Price.

HOW TO PREVENT STAINS AND STREAKS IN THE COLLODION NEGATIVE.

By R. W. Thomas.

[Being an abstract of a paper read before the Photographic Society of London, May 7, 1861.]

My object this evening is to place the subject of my paper in a practical light, and in doing this I will also endeavour to answer an objection which will present itself in the course of this inquiry. I shall divide the subject into two heads, and discuss them separately, viz.:—

1st. The action of light in the camera.

2nd. The influence of light in the operating-room.

First, the action of light in the camera.—All things considered, is it not wonderful that we have a clear image in a latent state upon the highly sensitive surface of the collodion plate? Light passes equally into the darkened chamber through the full aperture of the lens; but at the focus of the lens it is also deposited, so to speak, in a ratio equal to the reflecting power of the surfaces of the objects to be copied, impressing the first atoms of the sensitive film in a degree equal, as before stated, to the amount of light projected from the bodies to be represented, and I firmly believe that the first atoms only are affected in the camera. Now it will be readily granted, and very easily conceived, how soon a disturbing influence may be brought about by the introduction of any false light in the chamber wherein this image is produced; but notwithstanding this incontrovertible fact, there are those who remain careless as to the manner of rendering the camera absolutely dark.

In furtherance of this proposition, let us imagine that a bundle of thin surfaces, of any material sensitive to light, be placed at the slightest conceivable distance apart in the focus of the lens, the colour of each and all of the surfaces being antagonistic to the action of chemical rays (as yellow, the colour of the iodide of silver in the film), and the homogeneity of the colour favoured by the circumstance that light is not passed absolutely through these atoms, what will be the result of the action of light? Undoubtedly the image of the object to be copied will be deposited upon the first surface of the suppositious arrangement, and there receive a check. The next surface must, if at all impressed, be so through the yellow medium of the first; and so, of necessity, the light parts with a portion of its actinism; and having thus passed through the two yellow surfaces, I doubt whether any other of the series would be affected. I have made use of this hypothetical arrangement of surfaces for the convenience of explaining the views I am about to advance; but I do not for one moment wish it to be inferred that this explains the chemical phenomena involved, or that this action alone is the only force exercised.

I now proceed to examine the action of light in the dark room.—I think it will be allowed that the more sensitive a prepared plate is to objects in shadow, the more sensitive it will be to yellow light; and if a preparation could be made capable of producing a landscape in the camera illumined by moonlight, I need hardly remark that it would be necessary (arguing in the abstract) to prepare this highly sensitive plate in total darkness, and to develop it under precisely similar circumstances. Such a high degree of sensitiveness would be very inconvenient, and has not yet been

obtained; but such a discovery is within the bounds of probability, and the course to be pursued in order to obtain a clear image must, under such a condition of sensitiveness, be the one proposed.

There are those present who can remember the time when the negative paper process was the only one employed for taking portraits. The sitting, under the most favourable circumstances of light and short-focus lens, was sixty seconds; but generally, I think, averaged two minutes. Since the old paper negative process was set aside for the purposes of portraiture, the photographic chemists have been steadily advancing to perfection in the preparation of both collodion, nitrate of silver bath, and a few other less important chemicals, in order to obtain the maximum amount of sensitiveness, preserving at the same time other conditions necessary to the perfection of the result. But, let me ask, what have photographers been doing all this time? Many of them have been treating these improved preparations in much the same way as the man who would take pictures by moonshine and neglect the precautions just laid down necessary for the clearness of the image: in other words, photographers have been working in rooms with as much yellow light as was used in the old days of photography. Now I will endeavour to show the result of such a course. I will not suppose for a moment that any other than a neutral bath is being used. A plate is prepared and plunged into the nitrate of silver bath and the door of the room closed; after a minute or so the plate is taken out and moved up and down, to equalise the action of the bath and remove greasy lines caused by the contact of ether with water, these two not being at first perfectly miscible.

Now, at this stage all the damage is done: the so-called darkened room is by no means dark enough: the greasy lines are impressed more or less according to the intensity of the light prevailing at the time, and appear subsequently in the development as well marked as any other latent image that the lens is capable of producing. Let me ask you to call to mind the illustration I introduced—that the image in the camera impressed the first atoms of the collodion film, and that this film, in its position in the camera, was not translucent but opaque: hence the first atoms only were impressed. But the reverse of this takes place in the dark room. The prepared plate is always more or less transparent, and admits of light passing through it according to the relative position of the plate and the source of light. Moreover, at this stage of its excitation it *may* be in a highly sensitive condition.

Now is the time for me to introduce the only objection that can be made to this theory, viz., How is it that I can get perfectly clean pictures with a particular preparation of collodion, and may be the same or a particular bath, and yet when I take this or that preparation I obtain greasy lines or stains? In reply to this objection, I say, in the first place, that this statement, if it be made, is only partially true, and if true, the reason is evident. The most superficial observer must have been struck with the difference in the appearance of films of different kinds of collodion when immersed in the bath—some (even after a short immersion) becoming opaque, whilst others remain translucent even after a prolonged immersion. I make use of this objection as the strongest proof of the soundness of my views. Is it not clear that this very property of opacity arrests light passing through the film, and prevents the action traversing all the atoms of the mass in its entirety? Now, I think I have shown the use of my first illustration. The fact is, the surface of this opaque film is, in the dark room, in precisely the same position as the first atom of the translucent film, placed vertically in the focus of the lens, with an opaque body behind it, and clearly shows theoretically what is proved to be true by experiment, that the stains are not produced in the camera, whether the film be opaque or translucent, providing due attention be paid to the quality of the yellow light in the dark room; but, on the other hand, the stains can be produced at will, and especially with a translucent film, if the light in the dark room is not of the proper quality, or is too actinic. Herein we have the key to the whole position: the translucent film is more readily impressed by feeble light in the dark room, and this impression is rendered more permanent from the fact that light passes through the entirety of the atoms of the film in consequence of its translucency. I will now pass on to another phenomenon, which must have been to many a matter of astonishment, viz., the frequent occurrence of streaks in the background of a portrait, and their absorption at the point of contact with the image in absolute focus. Is not this an extraordinary fact? and, moreover, one worthy of close observation? I must confess that, until I gave a great deal of attention to this subject, I was not only puzzled but vexed at the want of a satisfactory answer. It was not satisfactory to my mind to be able to say I know how to produce and how to avoid these stains; I therefore set to work to find out some tangible reason and ground of explanation. The experiments I made appeared suggestive. I have the pleasure of handing round the results, by way of illustration. Plate No. 1 exhibits the image of a circular disc of yellow tammy stuck to the centre of a piece of amber-coloured glass. This was supported vertically on a stand, and a scratch made to indicate its position. A plate was prepared in the usual way, and a negative taken of the yellow disc. The exposure required was found to be three seconds. A second collodion plate was prepared, and exposed in the camera the same time—viz., three seconds—and the cap placed on the lens, an image of the same disc having been impressed; then the yellow glass with the disc was removed, and in its place a piece of white cardboard was substituted. Having effected this exchange of objects, the cap of the lens was removed, and an instantaneous exposure of the white card was impressed upon the latent image produced by the first exposure: the slide with the plate was then taken to the dark room and developed. Let me ask, what would you expect to find—the image of the yellow disc, the cardboard, or both? The result is, that the image of the disc is scarcely perceptible, and, moreover, was not any more evident at any stage of the development than is here represented. I ascertained this by stopping the development at various stages when repeating the experimenting. Again, in the third experiment the order of exposure was reversed—that is, the plate first impressed with an instantaneous exposure of the white cardboard was then exposed to the yellow disc. In this case the result is the same, the image of the disc being scarcely visible. To find out whether it could be made visible, plate No. 4, the result of another experiment, will show that it is possible; but, in order to effect it, an exposure of fifteen seconds was necessary, being five times the amount of exposure required under ordinary circumstances. Now, I think that these experiments may be made somewhat instructive. They, at any rate, very clearly show that the fainter impression becomes subservient to that more intense. This is either literally the case—the first disturbance of the atoms again giving place to a higher disturbing influence, and thus assuming the condition effected subsequently by the power of a more intensely acting ray; or if this be not so, the first image remains shrouded from view, owing to the more intensely reduced atoms being superimposed and under all circumstances prevailing.

I think I have said sufficient to show, and these plates will assist in confirmation of my views, that the faint images of streaks produced in feeble light become shrouded or absorbed by the more powerful action of the image in focus. As supplementary to my paper, let me offer a few remarks. What is the amount and character of light which can be safely used in the dark room? In reply to this inquiry there is fortunately a very clear answer. Let me state it: and first I wish to lay down as a rule that with properly prepared collodion, no matter what the light out-of-doors be, the negative image, whether under-exposed or just enough exposed, should more or less on some portions, and generally of course on those parts in deepest shadow, show a bright positive surface. If, therefore, the surface is at all deadened with a short exposure, notwithstanding that a neutral bath be used, then I say there is too much light in the room: no better test can be had. Another guide is the behaviour of the developer. The solution of pyrogallic acid should remain bright brown for some time: too much light in the room will cause it to blacken, and in some cases throw down a loose black deposit at a very early stage of the development. I recommend every one to adopt the course I am now going to suggest. Darken the room entirely, so that no object be discernible: slits, crevices, and holes will then be seen. Now let light into the room, passed through a piece of amber-coloured glass, covered closely on each side with a single thickness of yellow tammy. For the purpose of experiment, let this aperture of yellow light be as small as possible. Under these inconvenient conditions of light develop a picture, and note well its character; then find out by degrees how much larger the aperture of yellow light may be made, so that the beauty and purity of the picture be not less on comparison with the first result, obtained almost in darkness, and which may be called the test plate. It will then be very soon ascertained how large the aperture of yellow light may be made with safety. Let it be, however, remembered that this experiment must be performed on a bright day, when the light is strongest upon the covered yellow glass. I do not believe that either yellow glass or dyed stuffs *alone* can be depended on: the perfection of a yellow light for photographic purposes will be found in a combination of these two substances. The number of superficial square inches of light passing through this medium must be regulated according to the position of the window through which the light passes; hence the necessity for these experiments, and the difficulty in laying down any fixed rules. This is my formula for lighting a room with yellow light; but bear in mind that the want of a perfectly light-tight cover to the bath for use, whilst the plate is iodising, would be equally a source of stains and fogging; therefore, in making the *test* experiment, cover the bath and its case entirely over with black velvet, or some other dark material, should there be occasion to open the door during the preparation of the plate.

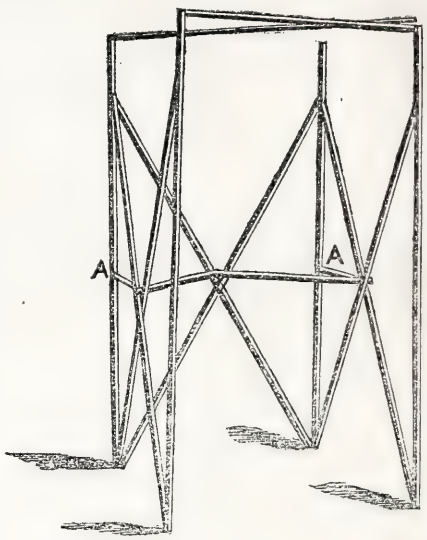
I assert plainly that the truth of this paper lies in a sentence. You may thrust away from your minds every theory that has been advanced, bearing in mind the one statement only, that the principal cause of want of success in photography, and of streaks in the negative, is due to the introduction of too much light in the dark room.

The apology for the length of my communication must be found in the fact that a simple statement of a simple truth is not in itself sufficient to impress men's minds with anything like a strong conviction. In order to do this, the statement must be elaborated, and then it may be expected that a greater amount of attention will be drawn to the subject-matter. I myself feel strong in the opinion with which I shall conclude this subject—that the future of photography lies in the bestowal of proper attention to the quality and quantity of the yellow light used in the operating room; and I shall be well satisfied in having devoted so much time and attention to this subject if a single follower of our art has, through the instrumentality of this communication, been freed from the gnawing anguish and irritation which attend the unsuccessful efforts of those who aspire to perfection.

AMERICAN PHOTOGRAPHIC TENT.

By J. Q. A. Tresize.

Having seen in your very valuable Journal, as well as in American journals, descriptions of variously formed tents for out-door work, with wet collodion, and thinking that none of them are equal to my own in convenience, I send you a view and description of a tent that I have had in use upwards of two years. It is composed, as the view shows, of four posts, 5 ft. 10 in. in height, and 1 in. square, and six braces, of 5 ft. 9½ in. long, and 1⅛ × ¾ in. thick. The braces are riveted or bolted together in the centre in pairs, and are all fastened to the feet of the posts by strap hinges, and to the top of the posts by pieces of iron about ⅛ in. thick, with a T on the upper end, the iron being fastened to the brace; and the T slides up and down in a groove that is cut *through* a piece of heavy hoop-iron, which is fastened to the top of each post, a corresponding groove being cut into the post about ¼ in. deep, to admit the sliding of the T. The irons on the posts are 11 in. long, and the grooves through them 10⅛ in. long; and there is a spring latch at the lower end of each to hold the T down when the tent is open. From top to top of the two front posts is a cross-bar 1 in. square, halved at the ends, with an iron strap round each end, to come down about ½ in. on the posts; and from one end of this to one of the back posts is a bar, with a pin near each end, which drop into holes in the front bar and the top of the back post.



It is then supplied with a frame on which to place the chemical box, as seen at A A.

The frame is all hinged together, and drops into the notches of the braces, except at each back post, where is a pin in the end of that piece of the frame that enters a hole through the post, as seen at A in the view.

This frame and these bars left off, the tent folds up into the space of 4 in. square and 6 ft. long; and, including bars, frame, and camera stand legs, weighs eleven pounds. It may be made of *half* the weight and be abundantly strong. When open it is 3 ft. square, and may be covered with cloth seamed all up, except in front. I use muslin painted with chrome yellow. The cover will add about nine pounds to the weight, and remains on the frame all the time. Then I have a box made of thin poplar boards, 3 ft. 1 in. long, 10 in. high, and 8 in. wide, all outside measurement. The top has 3½ in. of the front attached to it, and raises up and is hooked to one of the braces of the tent, while the lower 6 in. of the front falls down, forming a shelf 14½ in. broad, and the top furnishes a shelf 3½ in. broad. This box or case is set upon the frame in the tent, and when shut can be carried by a handle attached to the lid. Into this I pack my camera, top of stand, chemicals, bath, tin cistern (which holds one and a-half gallons of water), two vulcanite trays, and a gutta percha sink (with elastic pipe to lead off the waste water), each in a compartment to itself. The cistern is set up on moveable wire legs when in use. This case all filled, with plates in box, and *everything* for three dozen stereo. negatives, weighs twenty-eight and a-half pounds. I have carried it in one hand and the tent in the other one mile; and I can set it up in four minutes, put a plate in the bath, and can pack-up in four more.

Zanesville, Ohio.

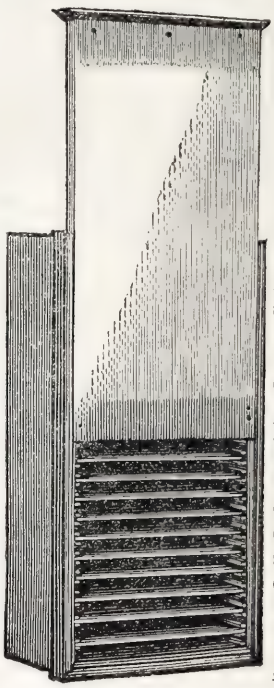
THE NEGATIVE ALBUMEN PROCESS ON GLASS.

By John Cramb.

(*Continued from page* 182.)

COATING OF THE PLATES.

This has been a great, if not the greatest, stumbling-block to the adoption of albumen by amateurs. It has been supposed to be very difficult to get an even or uniform coating on the plate. There is no difficulty in getting such a coating of albumen once on the glass; but there is some in having the plate *dried* so as to have a dry coating of equal thickness throughout. To get this the fluid albumen must be equally disposed over the plate while it is drying; and as it takes some time in the ordinary condition of our atmosphere to dry a plate, some arrangement of keeping the glass level while drying has usually been resorted to, or the plates have been dried over a fire, or stove, or hot plate. Any one will at once see that, on whatever plan we dry the plates, there will be imminent danger of their being injured, by dust falling on them while the operation of drying is going on, as well as while we are spreading the albumen on the plate. The use of a drying-box, in which the plates are all kept quite level while drying, and are also completely protected from dust, has generally been adopted. These boxes are constructed on various plans. A convenient arrangement is to have the box made of a size suited to take in the largest glasses we generally work. The glasses slide into grooves, which are so arranged that when one glass is level all are level. It is easy adjusting the box before we begin so that one glass is so levelled. Between each glass, and alternately with them, thin boards are inserted, which have previously been made very dry: these absorb the moisture from the plates, and so placed the glasses will dry in a few hours. The lid or door should slide so as to cover up each groove as we put a glass in.



A hinged door would expose the plates each time we put in a newly-coated one. A cover, to draw down in front, something like a window-blind, I esteem as the best plan. There can be nothing easier than the making of such a drying-box as I have described. But I would have little hope of many amateurs being disposed to have such a box made before they knew if they could succeed in taking a picture at all by the process. I will give you a plan which gives as good results, but is a little clumsy and inconvenient where a quantity is to be prepared. No special apparatus is required to be got, except, indeed, a simple spirit level, and that I think every landscape photographer should carry with him wherever he goes to level his camera with. We want a levelled place to put our plates on: a smooth table, levelled by wedges under the legs, will do for that. We want a cover to protect the film from dust: here, in the recess usual at the back of a common bead picture-frame, is this protector. We next require something that will absorb the moisture: the deal back of the frame exactly suits for this purpose. For small plates and great exactness a piece of waste plate-glass may be levelled on the table, on which we place the prepared glasses, and cover till dry.

Suppose you are ready to begin to coat glasses.—The albumen, beaten and iodised, is settled: it should now be filtered through sponge or fine linen. The drying-box should be tried if level. All the polished glasses should be rubbed with a piece of silk to remove any dust, and placed up against the wall or any other support. Let the dust so raised settle. The operator should leave the room and brush his clothes with a damp brush. After an hour or less he should go in gently and commence operations, making as little fuss as possible. The operation of coating is much the same as with collodion. Pour on an abundant amount of albumen to cover the plate easily; have a small piece of paper to guide the albumen over the plate, and to remove specks of dust and air bubbles; drain off the superfluous albumen, leaving as much on as *you want*—more or less will do, and the operator soon learns to leave a regular quantity. No one should be deterred from trying albumen by the careful direction given regarding the coating, danger of dust, &c. No great speciality of preparation or arrangement is absolutely necessary. With an ordinary degree of care I have successfully albumenised with the simple apparatus I have described in my bedroom in a Highland cottage and in a metropolitan hotel. Be careful, is my advice; but do not be afraid to try.

When dry, the glasses are ready for the next operation—the sensitising. The silver bath usually recommended, and which I alone used for a long time after I began the process, is:—

Water	1 ounce.
Nitrate of silver	45 grains.
Glacial acetic acid	45 minims.

This will answer admirably for plates with any iodising up to perhaps ten grains to the ounce of albumen. It gives slow

pictures, however. An albumen plate is silvered in an instant, and I am unable to say I ever observed any difference between those which were only a few seconds in the silver bath and those which were for a longer time. The flow of silver over the plate should be very rapid, the most momentary stop leaving a clear mark. A dipping bath will suit well, but a flat bath I prefer. In a dipping bath bubbles are apt to form on the surface, which mark the plate: besides, a flat bath does with a very small amount of silver solution. A bath of this description, made of gutta percha, I found to answer very well in my journey through Palestine.

For rapid plates I would recommend more silver, say sixty grains to the ounce, and not more than a sixth of the amount of acid.

After sensitising, the prepared plates are to be thoroughly washed to remove all the nitrate of silver that will wash out. For convenience and economy of water I generally use five or six dishes. On removal from the silver bath the plate is placed in No. 1 dish, and is there kept in agitation to prevent the insoluble silver salt formed from settling on the prepared surface, till nearly all the silver is removed; it is then passed to No. 2, and so on in succession to the last; finally washing for a short time under a tap, or by pouring water from a jug. I have been in the habit of using the ordinary water of the place I am in for all operations for which water is required in this process. Distilled water would be better for some purposes, but the advantage would not be anything like a compensation for the trouble and expense of procuring it in many places. In certain circumstances something more than washing with common water may be advantageous, if not absolutely necessary sometimes; but as my remarks are more intended for the tyro than the advanced practitioner, I do not enter on that further here.

KEEPING.

The albumenised plates, if properly dried and packed away, so as to be kept from damp, will keep for any length of time. I prepared my plates for the Holy Land before I left Glasgow; and I may say, on the question of the time it takes to coat plates, that some days I coated with my own hands 130 plates.

After silvering I have never tried to keep them longer than about six weeks, and generally I am content with keeping them a far shorter time. I have, however, found it quite suitable to prepare plates at home comfortably; go for a few days—as long as I wanted—to the country; expose my prepared plates as I went along; and develop and finish when I returned. Acting in this way, I have never lost a *view*, and they have generally been published. Many of them—perhaps I should say more correctly all—are far below what I would like to get. Some gentlemen photograph to get perfect pictures, or as near perfect as they can, and some merely to try processes and formulæ. I think there may be a third class, whose ambition is to get easily and with certainty good fair pictures.

(To be continued.)

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. V.

Spherical aberration is caused by the spherical forms of surfaces on which light is incident, or from which it emerges. When a ray is incident perpendicularly on the surface of a transparent body, it is not refracted at all: if the incident ray forms with the perpendicular a small angle, the refraction is little; but if the angle of incidence is greater, the refraction is also greater, and the more oblique an incident ray, the greater its refraction. It will be easy from this to comprehend how it is that a spherical surface is the cause of aberration. Referring again to *fig.* 1, page 85, suppose parallel rays to be incident on the spherical surface A E B of the lens A B, the central ray or axis proceeds on without being refracted, because it strikes the spherical surface, or its tangent at E, perpendicularly, and emerges from the back plane surface, also perpendicular to it. Now the ray C H (supposing it to be parallel to the axis) strikes the surface at H, and because it strikes the surface or its tangent at that point obliquely, it is refracted so as to cut the axis at *d*; all the rays between E and H cut the axis at intermediate points from *d* to infinity. The ray C B (supposing it also to be parallel to the axis) is incident on the edge of the lens at B; and because the surface or its tangent at B is more oblique, that ray is refracted more so as to cut the axis nearer the lens at *b*. It will be understood that the above is an explanation of the way in which the central pencil, whose axes coincide with the axis of the lens, is affected. An oblique pencil is acted on differently; for instance, the axis D E *g* of the oblique pencil D A B strikes the plate at *f*; the outermost ray D A, after passing the plano-convex lens, cuts the axis at *m* before it arrives at *f*, the focus; the opposite outermost ray D B is refracted less (for the reasons I have stated), and therefore cuts the axis at *g* beyond the focus *f*; thus *all* the rays on one side of the axis of the oblique pencil cut that axis before they reach the focus, and all those on the other side of the axis cut it beyond the focus. This is called astigmatism. If the lens were reversed, with its plane side towards the object, the effects would also be reversed—that is, those rays which cut the axis beyond the focus would now cut it short of that point, and so on with the others.

People unacquainted with optics naturally ask whether, seeing the spherical form produces aberration, there are not other curves which would not do so. There are, viz., the ellipse and hyperbola, that is, for central pencils; but these forms would be worse for oblique pencils than the spherical: besides which the thing is at present practically impossible, because it has not yet been discovered how to grind glass into these forms accurately.

From an inspection of the *fig.* and what I have here stated, any one will comprehend how spherical aberration is prevented, or at least reduced by a small stop; for, when the whole aperture A B of the lens is used, the angle A *b* B, formed by the outermost rays A *b* and B *b*, cutting the axis at *b*, is large; whereas if a stop, whose diameter is F H, be introduced, the outermost rays F *d* and H *d* do not cut the axis till they arrive at *d*—thus the angle F *d* H is more acute than A *b* B, and supposing the plate *h k* to be midway betwixt the points *b* and *d*, it is evident that the pencil A *b* B, converging to *b* and then diverging, will be diffused over a greater space on the plate than the pencil F *d* H; therefore the definition will be worse in the former case than the latter; and in like manner a small stop diminishes the astigmatism of oblique pencils, but cutting off the rays from F to A and from H to B, leaves the remainder of the pencil to approximate more nearly to the focus *f*.

Light is composed of the three primary colours—red, blue, and yellow: its decomposition occurs along with refraction. When white or daylight is refracted at the surface of any transparent medium, it is decomposed into what are called the prismatic colours—that is, those above indicated, together with the secondary or compound colours, violet, indigo, green, orange, and innumerable other shades resulting from their intermixture in endless proportions. Violet is the most refrangible colour, and red the least so. In the *fig.* suppose a ray or small beam of light to strike the lens at F, and to be refracted and dispersed in such a way that the red cuts the axis at *d*, the violet at *b*, and the other rays of intermediate refrangibility at all points from *b* to *d*, then it is plain that no sharp or clear image of any object could be formed with the light in this condition. This is chromatic aberration. The greater the refraction the greater the dispersion or separation of colour: therefore the light which passes the lens near the margin shows more colour and consequently worse definition than that near the centre. Here is seen again the value of a small stop as well as in spherical aberration.

It would be out of place here to say anything of the means or contrivances for correcting spherical and chromatic aberration, excepting so far as I have done in relation to stops, as information on them can be obtained from the elementary works on optics.

A knowledge of the chemical or actinic powers of natural colours is of great use to the practical photographer, as it saves a great deal of trouble, as well as enables him to produce superior pictures, particularly portraits. White light acts more powerfully than any colour: of the primary colours blue is the next, whereas yellow and red act almost the same as black. By the mixture of white, blue, red, and yellow, in various proportions, all shades are produced, and operate chemically according to the proportions of the primary colours in any shade or compound colour: thus light blue, a mixture of strong blue and white, is very powerful; so also is lilac or puce, a mixture of light blue and a little red. Pink, a mixture of white and a little red, is an energetic colour; and then come violet and blue. By taking into consideration the composition of any shade or compound colour, it may be guessed very nearly how it will act. Any colour in which there is a large proportion of white or blue acts quickly; but when yellow or red predominate the action is weak. Grey, particularly light grey, is quick acting, because there is a large proportion of white in it. Drab is much the same. Brown is not a slow colour, though there is a great deal of red in it. Orange is weak, because composed of red and yellow. Green is also a feeble colour.

In taking a portrait the face is the most important and first consideration. If the portraits of two persons have to be taken—one with a "jolly red face" and dark eyes, and the other with blanched cheeks and light eyes—it is quite certain that the same exposure

will not answer equally well for both: whatever colours of clothes they have on, the red face must have the longest exposure. The physiognomy most difficult to take is a red face, sandy hair, and light blue eyes. Such a subject must be timed and developed to the greatest nicety, or it will be a miserable thing when done. In taking either portraits or views it is advisable to take into account not only the time of day, and the lightness or dulness of it, but also the *hue* or *colour* of the light at the time.

These considerations in reference to colour must not be forgotten when taking a group, as there is often a wide variation in complexions.

[The Editor is in no way responsible for the opinions advanced by Mr. Rothwell.]

Exhibition.

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Exhibition of this Society, proposed to be held at Aston Hall, was partly opened on Tuesday the 28th ult.; and although only so short a notice could be given of it, the response on the part of some of our first photographers has been most liberal.

We noticed amongst the list of contributors the names of Mr. Mudd, of Manchester, who sends eighteen pictures, including his *Coniston Falls*, *Goderich Castle*, &c.; Mr. Vernon Heath, fifteen, comprising his *Views of Endsleigh*, the seat of the Duke of Bedford, &c.; Mr. F. Bedford, twenty of his architectural and other subjects—and Messrs. Thompson, the publishers, also exhibit twenty-four pictures by the same artist; Mr. Samuel Fry, nine; Messrs. Wall and Co., three, one being a portrait in oil, by Mr. A. H. Wall; Lyndon Smith, Esq., Leeds, four; John H. Morgan, Esq., Clifton, twenty-four; the Rev. T. Melville Raven, eighteen; Major Gresley, of Winterdyne, near Bewdley, sends eight; Major Shakespear, Royal Artillery, five—*Views in the Island of Corfu;* T. C. Earl, of Worcester, eleven, comprising his panoramic and other *Views of Raglan Castle*, &c.; Mr. Robert Gordon, of the Isle of Wight, seven; Mr. Annan, of Glasgow, seven, who is at present the only exhibitor from Scotland, as is Mr. Brownrigg, of Dublin, from Ireland, who sends two pictures; Mr. Lyley, of Bristol, twelve; Mr. Rogerson, of Manchester, four by the waxed-paper process; Dr. Anthony contributes six pictures, being a portion of Robertson's *Views of Sebastopol and Neighbourhood;* Miss Campbell, of Gaud, a beautiful little reproduction; and Mr. Bowen, of Kilbain, a *Study of a Cottage in Middlesex*. A number of photographs from China, taken during the late war, and kindly lent by a Birmingham gentleman, will form a very interesting portion of the Exhibition; while Messrs. Rejlander and Robinson make a good show in their respective departments. Portraiture is as yet the weakest point in the Exhibition, and while M. Claudet sends some twenty-four specimens, we miss with regret the names of Mayall, Williams, &c., in this branch, as in others we also miss those of Fenton, Maxwell Lyte, Lake Price, Frith, Cundall and Downes, Dolamore and Bullock, Negretti and Zambra, Cocke, Wilson, Baldus, Bisson, &c. &c.

The productions from the solar camera are not so numerous as we hoped from the liberality displayed on the part of the Society in awarding two medals to them. Messrs. Smyth and Blanchard of London contribute six, Mr. Angel of Exeter four, and Mr. Atkinson of Liverpool three, all plain untouched prints; Mr. Turner of Birmingham three plain and two coloured in oil, and Mr. Pickering of Birmingham three coloured ones.

The only stereographs we have to notice are those of C. Bruse, Esq., of Birmingham, which are very remarkable instantaneous pictures.

At present the Society has not received any apparatus. This is to be regretted, as they have space at their disposal for a large display; as also for hanging a large number of pictures, should any gentleman who has not yet contributed feel disposed to assist the committee by doing so, either at once or at any time during the continuance of the Exhibition; but of course they will now be ineligible to compete for the medals of the Society.

We were very much surprised to find that the Birmingham photographers had exhibited so few pictures, as there are many gentlemen in the town using the solar camera; but not only in "solars," but in portraiture and landscape, the Birmingham Society is entirely unrepresented, except by Messrs. Rejlander and Robinson; and it is to be the more regretted as there are men in the town capable of producing first-class pictures.

We hope in the next number of the Journal to give a more detailed description, and also a list of the successful competitors.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Thursday evening, the 17th ult., at St. Peter's School Room, Walworth, at eight o'clock,—Sebastian Davis, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman announced that Mr. Wall, their Secretary, had presented their portfolio with four album portraits of public characters, photographed by himself.

Mr. S. Smith read a paper *On the Solar Camera*, and exhibited several portraits enlarged by that instrument. Some of these pictures were on rough paper, so that they might be finished with chalk; others on smooth paper for oil or water colours.

Mr. Blanchard, after explaining the construction of a solar camera that was on the table, said he had never tried to enlarge photographs to a greater size than double *Saxe* paper, but it was quite possible to get a full length portrait six feet high—in fact, there was scarcely a limit to the size; but of course the larger the picture the less of detail and distinctness it presented. In answer to Mr. Simpson he said the size of the sun's image on the back lens of the portrait combination was only one-eighth of an inch, and therefore the remainder of that lens was not employed in the operation, so that a meniscus lens would be sufficient for the purpose. He thought either dry or wet plates might be used, and the picture printed by superposition. The dry plate not being so dense as the wet plate would answer better in the solar camera, as the weakest negative gave the best positive prints.

The Chairman said if stereoscopic plates could be enlarged to about ten by eight or nine by seven, the effect would be very beautiful. Could Mr. Smith enlarge a stereoscopic slide by their next meeting?

Mr. Smith intended doing so, and he had been promised a slide by Mr. Howard for that purpose.

Mr. Wall had always been anxious to get enlarged pictures for the purpose of finishing them in oil or water colours, but he had invariably found that, although the small picture appeared to be full of detail and half-tone, the enlarged one seemed a mass of flat shadows and flat lights. On comparing them carefully he found the larger was a faithful copy of the smaller photograph; but the faults unnoticed in the latter became prominent in the former. The pictures then before them, on the contrary, presented sufficient detail and half-tone, and looked quite round; and this was the result of a somewhat important fact, viz., that they were procured from such negatives as—although full of detail and gradation—were too weak for printing small pictures of their own size.

Mr. Howard, like many other amateurs, had been desirous of enlarging his stereoscopic pictures, and had tried to enlarge his negatives by the old method; but he found that, after enlarging to twice the size, the picture became indistinct, and the effect was decidedly objectionable. In 1859 he had mentioned the subject at one of their meetings, and had exhibited a picture he had enlarged. He had on that occasion used a quarter-plate lens, allowing a strong light to pass through it, and the image was received at the proper distance upon a wet collodion plate. The exposure was about a minute and a-half.

Mr. Fry said he had practised enlarging, and always preferred obtaining a transparency on glass, and printing from it by superposition. By that means either pyrogallic or iron developed negatives might be employed. Transparencies were very superior to print from, as the colour of the print would be regulated easily, and *vignettes* could be obtained by shading the margin of the plate. He did not use a wet collodion plate, but a large Fothergill one. He had used for some time the legitimate Woodward's camera, and, after many trials, he came to the conclusion that it was better to use the north light of the sky than the direct rays of the sun. It did not matter in that case whether the sun shone or not, so long as it did not shine into the camera. Some time ago he had enlarged a negative of an oil picture to 34 by 23, for the purpose of the engraver. Certainly the pictures then exhibited by Mr. Smith and Mr. Blanchard were very fine indeed, and he thought they deserved the thanks of the Society for the trouble they had taken in bringing the subject before them. He had used the pure sea salts to prepare his paper for taking enlarged pictures, instead of employing the regular solutions of bromides and iodides, and he found they answered excellently. A chemist at Brighton, named Schweitzer, prepared the salts for aquariums and artificial sea baths; these might also be used with advantage for albumenised paper, instead of chloride of sodium.

Mr. Blanchard exhibited a print spoilt through too rapid evaporation going on whilst the paper was wet. He also alluded to the purpose to which the solar camera might be applied, viz., throwing the image on the canvas for the artist to trace over with his pencil, and to obtain a perfectly accurate outline in a few minutes, instead of giving some hours to the operation, as was usually the case. He had frequently taken portraits in this manner.

Mr. Hughes said it would be better for artists who wished to paint the enlarged image direct on their canvas to work with a transparent positive, as then they would have light for light and shadow for shadow. With regard to Mr. Fry's remarks, he thought that gentleman was the first who had said a north light acted better with the solar camera than the direct rays of the sun; in fact, the electric and the oxyhydrogen

ights were generally preferred to the diffused light of the northern sky. n his (Mr. Hughes's) opinion there was almost as much difference etween the direct light of the sun and a north light as there was etween day and moonlight.

Mr. BLANCHARD said it must be recollected that Mr. Fry always used ither wet or dry plates on which to take the enlarged picture, which vere far more sensitive than the wet paper.

The thanks of the meeting were given to Mr. Smith and Mr. Blanchard.

Mr. WALL, the Secretary, read his paper *On Sharpness: What is it?* [See page 201.]

After the reading, the Chairman invited discussion on the paper, and particularly asked Mr. Hughes to express his opinions.

Mr. HUGHES said he thought their worthy Secretary had selected a wrong title for his paper: he should have called it "Sharpness, and When is it Properly Used?" He thought photographers were entirely agreed with regard to the nature of sharpness, and the only dispute among them was as to how and when it should be used. The answer to the question, "What is sharpness?" appeared obvious, until a person endeavoured to define it. The fact was, *sharpness* was like one of those primitive sensations that they had no words to describe. He should say—"Go and look at the ground glass at the back of your lens, and, upon accurately adjusting the focus, there you will *see* sharpness." How far it was desirable to indiscriminately employ it was quite a different thing: in most cases it was highly desirable, in some less so. Sharpness, like every other good thing, required to be used in its proper place. It was an excellent thing in a razor, but not in a paper-knife. The old adage that "children should not play with sharp edged tools" applied to inexperienced photographers; for it was clearly an abuse of sharpness to delineate every brick in the wall behind as carefully as the head of the sitter in advance of it. But while admitting its occasional misapplication, he could never forget its high qualities. However artists might disagree among themselves about it, there was no one point upon which photographers were so thoroughly at one with each other as on the desirability of sharpness. To secure it they employed the most skilful opticians, and gave large sums for their lenses; and no pains were considered too great to secure it in its highest and most exalted condition. Why had not enlarged pictures been more general? Because of the loss of sharpness. And was it not the great merit of the solar camera that, while it enlarged the image, it lost less of that vital quality, sharpness, than any other instrument? But all parts of a picture were seldom equally sharp, and hence arose the question, where should be the sharpest part? On that point, too, he thought photographers had sounder views and more correct practice than their artistic friends gave them credit for. Take a portrait, for example, where should be the greatest sharpness? Why certainly in the head, for that was the most important; and of all parts of the head the *eye* was invariably selected as the portion to focus on, for the photographer naturally felt that if there be mind, feeling, or character, in the individual, the eye—"the window of the soul"—must express it. In like manner, in taking a group, some figures were felt to be more important than others, and on them was concentrated the focus; and thus the exigencies of the photographer and the practice of artists were brought into harmony. It was important not to confound *hardness* and *sharpness*, for they were very different. Hardness was absence of half-tone and gradation—a more rapid transition from high light to deep shadow than was natural. A picture might be sharp and hard, or it might be sharp and yet soft. A picture might also be hard and not sharp at all: any impression, if under-exposed and over-developed, would certainly be hard, but whether it would be sharp depended on totally different conditions. Through the whole of Mr. Wall's paper there was a tendency to saddle the faults of hardness on the back of sharpness. Condemn hardness by all means, but not the power of definition. Mr. Wall made a mistake when he said inferior lenses gave harder outlines to the face than superior ones. He thought such hardness was attributable to defective manipulation and lighting rather than to the lens. A lens that was incapable of giving correct definition could never give a firmer or more decided line than a superior lens. Perfect sharpness was entirely consistent with perfect softness. A hard picture was an imperfect picture, for it gave only the highest lights and deepest shadows—and it exaggerated those. Perfect sharpness, however, defined not only high lights and deep shades, but all the intermediate gradations and half-tints, and the presence of the latter constituted softness; therefore, a truly sharp picture was not a hard, but must be a soft, one.

Mr. HOWARD defined sharpness as a necessity arising from the practice that had been adopted during the last few years of representing nature and minute objects in small pictures. In large paintings they saw that only the principal figures were sharp; but in the small cabinet pictures there was as much sharpness as in a photograph. In early photographs only one-third of the picture was visible, and, therefore, the sharpness was confined to one place; whereas now, by the aid of improved instruments, nearly the whole of the picture could be made sharp. Thus sharpness had, as he said at first, become a necessity.

Mr. FRY agreed with Mr. Hughes that enlarged pictures would never be generally made use of, on account of their want of sharpness.

The CHAIRMAN said he should define sharpness as freedom from optical distortion when the picture was seen at the proper angle and distance. Sharpness depended greatly upon the distance at which the picture was to be presented to the eye; for instance, a large picture required less detail than a smaller one, because it was to be looked at from a greater distance. Sharpness ought not to be confined to one spot, but ought to be equally distributed over the whole picture. In a lens he was examining the other day he found the sharpness was confined to a microscopic spot, whilst there was no sharpness over the rest of the picture. Foreign lenses did not give anything like the same sharpness as those of English make, but what they did give was more uniformly distributed over the picture. They ought to aim at equal sharpness all over the picture; but he did not think any person would focus for the back of the picture instead of the foreground.

Mr. WALL, in reply, entered into a discussion with Mr. Hughes regarding certain opinions expressed by various authorities, and tending, he (Mr. Wall) thought, to show that opinions upon this subject were not at all so unanimous as Mr. Hughes had stated they were. He then proceeded to say that he had shown, at all events, that there was a great difference among photographers and artists as to what sharpness really was. Mr. Hughes had said that a photographer need only look for sharpness on the ground glass; but he replied that Mr. Hughes had forgotten that the eye only saw that which it brought with it the power to see. If the photographer mistook hardness for sharpness, he would contrive to get hardness instead of sharpness; and he therefore thought it very advisable that some attempt should be made to define what sharpness legitimately was, so that other evil qualities might not be mistaken for it, and described by its name, to the detriment of the art and the injury of its professors. With regard to the definition given by an inferior lens, he thought Mr. Hughes was right in saying that the hardness was owing to the manipulation and not to the lens. In answer to Mr. Howard, he might say that the same qualities would be required in the large as were required in the cabinet pictures, with this difference, that, to take in the whole of each production, the spectator would have to place himself nearer to or farther from the picture, according to its size, and consequently the treatment would be varied just as much as was necessary to meet such requirements, although the principles of pictorial art would not be changed in the least for either case. Mr. Fry, in his reference to the solar camera, had overlooked this fact in his remarks upon Mr. Smith's beautiful productions. The delicacy and tender finish of a miniature would be out of place, and produce a want of roundness and vigour, if applied to a life-size head on canvas; and just so would the characteristics of a small photograph be out of place applied to large heads like those before them. He was so sure that there was infinitely more detail and drawing in these enlarged photographs than in the smaller, that he would assert that a reduced copy of one of them would give a very superior and remarkably beautiful result. He rather fancied that what Mr. Fry would regard as sharpness he might be inclined to define as hardness, or something approximating to it.

Mr. FRY said not at all.

Mr. WALL, in continuation of his reply, said their Chairman thought no person would be so absurd as to focus for the back or distance of a picture. Now, there were plenty of photographs in existence which might serve to convince Mr. Davis that there *were* such persons in existence; and, by way of instance, he might mention a fact he had once before publicly referred to:—At a meeting of a photographic society, a picture, produced by a celebrated lady photographer, was very highly praised because it represented a church not less than five miles distant as distinctly as objects in the foreground—these being, if he remembered rightly, the very words used. In conclusion, he must add that they should endeavour to train the eye of the photographer to see the qualities most desirable in their productions, and not suppose that the uneducated instincts of every man were sufficient to make him a judge of what did or what did not constitute this or that quality of art.

A vote of thanks was then passed to Mr. Wall for his paper.

The CHAIRMAN announced that the next meeting would be their annual one, and that it was the intention of the Managing Committee to propose great alterations in the management and rules of the Society. He therefore requested there would be a full attendance of members on that occasion.

Mr. HUGHES gave notice of his intention of moving, on the next meeting night, certain alterations in the laws of the Society.

The proceedings terminated with the usual vote of thanks to the Chairman.

EDINBURGH PHOTOGRAPHIC SOCIETY.

WE resume our notice of the last meeting of this Society, held on 17th ult.

At the close of Mr. Davies's paper *On the Photographic Properties of Gold* [see page 183],

Mr. NICOL said he should like to make one or two observations. In the first place they were all much indebted to Mr. Davies for the paper he had just read, in which he had gone pretty thoroughly into the matter. He could not, however, altogether subscribe to his conclusions. It would be evident to most of them who had been accustomed to make chloride of gold, that Mr. Davies's habit of making it of impure gilders' sweepings, with his statement that a certain quantity of these sweepings would give us a certain quantity of chloride of gold, was somewhat open to objection. Besides, photography being an art the beauty of which very much depended on purity, and it being pretty evident that these gilders' sweepings were contaminated with base metals, he thought it was better to make use of as pure gold as they could possibly procure. A half-sovereign would yield ninety-two grains of chloride, which would be at the rate of nine grains for a shilling if they manufactured it for themselves,

which he found few amateurs cared about doing, and he had no doubt fewer still would do so were it not for the fact that the sealed tubes usually represented as containing fifteen grains were often notoriously deficient. They had gone through many hundreds of them, and some time ago his attention was called to a sample by one of the best makers. He opened and tested one tube, which he found to contain only 6·44 grains of metallic gold. He at once wrote to the manufacturer, and received a letter admitting that it contained about 20 to 25 per cent. of chloride of sodium, but that nevertheless there was none purer in the market. Since that time he had given up purchasing tubes and now made it himself, keeping it in solution, which was sold at the rate of 2½d. for each grain of pure chloride. It was impossible to keep chloride of gold in solution along with carbonate of soda. To make it keep, acid must be added; for, if neutral or alkaline, it would undergo decomposition. Although Mr. Davies's process might do for an occasional experiment, yet it was faulty. There should be a process for obtaining a solution of gold quite neutral without the use of alkali. A good way of making chloride was to put a piece of pure gold into muriatic acid, and add nitric acid until the action commenced. When dissolved it was put on a water bath and evaporated to dryness. They had by this mode of proceeding chloride of gold nearly neutral, and which would keep any length of time. Mr. Davies's system, then, he thought to be faulty, first, because it required to be neutralised by sodium. Would Mr. Davies tell the members how many square inches a grain of chloride of gold would tone? Before sitting down he might mention that the amateur had a very simple method of keeping himself square when purchasing chloride of gold. A solution of protosulphate of iron was added to it, when the pure gold would be precipitated in a metallic form, which might then be filtered and weighed.

Mr. Walker said he would like to ask what objection there was to making the chloride of gold by the direct action of chlorine on gold. They all knew that it would dissolve the gold, and it appeared obvious they would by this means obtain an absolutely neutral and pure chloride of gold.

A Member: But will chlorine dissolve gold?

Mr. Nicol said that gold was soluble in a solution of chlorine, and Mr. Walker was quite correct in supposing the resulting salt would be neutral; but the objection to that method was the very great length of time they must wait before dissolution would take place. It was done by getting a Woolf's bottle full of water, to which was added the gold in the form of gold leaf; a current of chlorine to be passed through it until the solution was complete. He had prepared some by this process; but the trouble and expense was such that it was very undesirable to do it.

Mr. Davies remarked that he often dried off the acid by heat, although he had not done so that night. In reference to the number of square inches a grain of gold would tone, he thought it had been estimated at 144.

A Member said that a grain of pure gold should and did tone well 500 square inches.

Dean of Guild Mossman said it seemed that there was a great deal of adulteration carried on in connexion with the manufacture of that article; and if similar adulteration existed in other chemicals, it would be well that, for the benefit of the young and inexperienced members, the Society would enter into an arrangement with some chemist to supply the members with absolutely pure chemicals at a certain rate.

Mr. Taylor introduced the subject of toning prints by the hyposulphite of gold or *sel d'or* process; and, for the benefit of the younger members, explained that by this method the toning and fixing of a print were carried on simultaneously, one solution only being required. This solution was prepared by pouring a solution of chloride of gold into a strong solution of hyposulphite of soda. The convenience of this over what is termed alkaline gold-toning, was marked, and the results were very beautiful. While he was not aware of any great objection to this method of toning, it had one advantage over alkaline gold-toning in that it did not require such over-printing. There had been a cry raised about the permanency of prints so toned; he did not think this alleged objection could be substantiated. He thought that, with proper care, prints toned, even by the "old hypo." process, in which no gold at all entered, might be rendered permanent. He did not wish to decry the alkaline toning (which he often employed), but he wished to speak a word in favour of the other methods, which it was now so fashionable to undervalue. If he mistook not, Mr. Ramage had had some experience with the *sel d'or* process of toning and fixing; perhaps he would give them the result of that experience.

Mr. Ramage said he had never had a print which, when properly washed, faded; and he had toned many hundreds by the hyposulphite of gold. When pictures toned in that way faded, it was always the result of imperfect washing.

Mr. Davies observed that many of the prints belonging to the Architectural Photographic Society, which were recently exhibited in Edinburgh, were toned by the old process, and several of them were nearly totally destroyed; the dingy yellow whites were very noticeable. He had often used the *sel d'or* process, and had no hesitation in saying that by means of it they would get very beautiful prints. Perhaps with some negatives they would get a better quality of print than they could with alkaline chloride of gold; but it was with what he believed to be the "galvanic process" of toning that they would get permanency.

Mr. Nicol thought they were all very much agreed that the alkaline method was the best. He had no sympathy with the outcry raised against an old friend. It was just as permanent every bit; but it required much longer and more careful washing. He had a picture toned in that way which had been for the last five years hanging up exposed to all sorts of treatment, and coming in contact with all sorts of gaseous vapour, and yet the picture was just as beautiful as the day it was first taken. The alkaline process was much quicker than the old way, and he preferred it when toning a number of prints at a time; but when he had only one or two to do, he used the other. As for Mr. Davies's idea of accounting for the action of the gold in analogy with electro-deposition, he feared there were no good grounds for it. He had recently experimented with a view to determine the nature of the photographic image, and he had sufficient evidence to warrant him in believing that the picture did not consist in any degree of pure metallic gold, which it would have done were it toned by a process analogous to that of electro-deposition.

After some further desultory conversation, the meeting separated.

The next meeting takes place on the 5th inst., in George Street Hall.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The fifth annual general meeting of this Society was held at 51, George Street, Edinburgh, on the evening of Tuesday, the 14th ult. There was not a very numerous attendance. George Moir, Esq., occupied the chair.

Capt. Suttie having been admitted a member, the Secretary read the

ANNUAL REPORT.

In presenting their report on the conclusion of the fifth year of the Society's existence, the Council would have been glad if they had been enabled to congratulate the members on the past year having been one of more marked progress. Believing, however, that it rests very much with the members themselves to add not only to the interest of the meetings, but to the usefulness of the Society generally, the Council do not doubt but the prominent place which the Society has hitherto occupied will be fully maintained; and while they trust that before next season they may be able to make such arrangements as will add to the attractiveness of the monthly meetings, they would desire strongly to urge upon members, individually, the many advantages which would arise if they would communicate freely the results of their investigations and experience in particular departments of the art. Great discoveries are possibly not now to be expected; but there is still an ample field for improvement in all the various branches of the art—chemical, optical, and manipulatory; and nothing would form a more attractive feature in the meetings of the Society than the unreserved communication of such details, as well as the exhibition of any new apparatus of which the members of the Society may be in possession. While regretting, however, that more has not been done, the Council may fairly congratulate the Society on having been the means of giving to the photographic world so many interesting papers as were read before them last year, and published in the *Photographic Journal;* and they desire to record the obligations under which they lie to Sir D. Brewster, Mr. Claudet, Mr. Wall, Mr. L'Amy, Mr. Tunny, Mr. Walker, Mr. Taylor, Mr. Maxwell Lyte, Mr. Cramb, Mr. Burnett, and others, for having contributed them.

At the last annual general meeting the Council had the pleasure of recommending that the Society's bronze medal should be awarded to Mr. Macnair, for the account which he had laid before the Society of his new dry collodion process. The Council are glad to observe that further experience of this valuable process has completely justified their recommendation. All who have practised it are convinced that it is much the best dry process yet discovered. Its great advantages are the simplicity and certainty of the preparation, the sensitiveness in the camera, and rapidity of development (approaching in these respects even to wet collodion), the great length of time which it enables the plates to be kept without the slightest deterioration, and the vigour and delicacy of the resulting pictures. Whilst so many new dry processes, or rather modifications of existing processes, are being brought before the public—many of which, by their complication and uncertainty, prove unsatisfactory when tested by the practical photographer—it must be highly satisfactory to the Society to have been the means, through one of its members, of introducing a process which is really valuable and practical.

As the Society is aware, the opening of the last Exhibition was postponed from December to February. This was done under the impression that a larger number of visitors might be expected at a season when there are more strangers in town, and the weather is more favourable for visiting places of the kind; the result, however, has not been such as was anticipated, and the Council therefore propose that the next Exhibition should be opened in December, as formerly. The Council are glad to say that, notwithstanding the diminished attendance, the Exhibition will still leave a small balance at the credit of the Society; and they need scarcely remind members that in all other respects it was completely successful—a similar collection in point of merit, more particularly in landscape photography, having probably not previously been brought together.

The two silver medals of the Society were this year awarded to Messrs. Claudet and Maxwell Lyte; and on the suggestion of Mr. Horatio Ross, who had again kindly acted as judge, an additional bronze medal was awarded to Mr. H. P. Robinson. It would doubtless be gratifying to the Society to see how much the award of their medals is appreciated—Mr. Claudet having come from London specially to receive his, and both the other gentlemen having expressed in very flattering terms their sense of the honour conferred on them.

Notwithstanding the comparatively unfavourable result of the Exhibition, the funds of the Society are in a highly satisfactory position, as will be seen by the annexed statement.

It will be in the recollection of the Society that it was thought desirable to accumulate from the annual income a fund to be applied in procuring rooms for the special use of the Society. From the experience gained elsewhere, however, the Council fear that the great expense attendant on such a scheme, both in reference to original outlay and annual expenditure, places it beyond the reach of the Society. Accordingly, they would now propose that the Society should limit its exertions in this direction, and rather look to entering into an arrangement for acquiring convenient premises along with other kindred societies. As the Council are of opinion that the fund already accumulated should prove sufficient for this purpose, they would suggest that in future years a portion of the annual income should be applied in furnishing to each member a photograph, or photographs, illustrative of the progress of the art; and they would hope that in this way the non-resident members of the Society will be enabled to share somewhat more largely than they do at present in its advantages.

As required by the laws of the Society, the President, the Senior Vice-President (Mr. Horatio Ross), the four Senior Members of the Council (Messrs. A. Y. Herries, George Harvey, T. Melville Raven, and T. B. Johnston), the Honorary Secretary, and the Honorary Treasurer, retire upon this occasion, but are re-eligible.

The Council would suggest that the President, Vice-President, Secretary, and Treasurer should be re-elected to their respective offices; that Mr. Herries and Mr. Johnston should be re-elected as councillors; and that Major Ramsay L'Amy and Mr. Findlay Anderson should be elected in place of Mr. Harvey, who has expressed a desire to retire, and Mr. Raven, who now resides in England.

A state of the funds for the past year is annexed, showing the sum of £386 18s. 11d. in favour of the Society, as compared with £315 12s. 8d. at the close of the preceding year.

On the motion of Sheriff Hallard, seconded by Wm. Walker, Esq., the report was unanimously adopted.

STATE OF THE FUNDS AT MAY 1, 1861.

alance in favour of the Society on the general account, at 1st May, 1861.....	£380	9	3
alance on accounts in connexion with the Exhibition and sale of photographs	4	7	8
rrears of subscriptions due by members considered recoverable.....	2	2	0
Amount of funds as at 1st May, 1861.....	£386	18	11

Mr. Bryson then exhibited a portable stereoscopic camera; Mr. Auchie a mahogany expanding camera, by Thomas, of London (which, as a piece of cabinet work, was much admired); and Mr. Taylor showed some negatives and transparencies by the tannin process, after which the meeting separated.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held in their room, at the Odd Fellows Hall, Temple Street, Birmingham, on Tuesday evening last, the 28th ult., when Mr. W. B. Osborne, Vice-President, took the chair.

The circular convening the meeting having been read, the proceedings of the last meeting of the Society were read and confirmed.

Mr. Brown said that prospectuses had been forwarded to him by the Amateur Photographic Association, copies of which he would be happy to hand over to any gentleman who might desire them. In his opinion the advantages to be derived from joining the Association were very great, particularly to amateurs, for whom it was more especially intended. He saw that the scheme had been written down in some of the journals; but if any gentleman would take the trouble to read the rules, he would find that the Amateurs' Association offered far greater benefits than could be obtained by means of any exchange club or society of that kind. Mr. Brown also stated that he had received the prospectus of a Photographic Exhibition, to be held in Manchester, in connexion with the Meeting of the British Association.

The Chairman then made some remarks upon a paper read by Mr. R. W. Thomas, before the London Photographic Society, on May 7th, entitled *How to Prevent Stains and Streaks in the Collodion Negative.* Mr. Osborn read the salient points in the paper, in which it was contended that the principal cause of want of success in photography, and of streaks in the negative, is due to the introduction of too much light in the dark room; and, in order to remedy this, it is suggested that no light should be admitted into the dark room except through a piece of amber-coloured glass, covered closely on each side with a single thickness of yellow tammy. He then said that he had been induced to make a few remarks upon that subject because it struck him that that paper, coming from one who was such a high authority in photographic matters as Mr. Thomas, was calculated to do a good deal of damage, especially amongst amateurs. Mr. Thomas started with the assertion that they had all too much light in their operating rooms, and that light coming through yellow glass still retained so much actinism as would produce stains; and recommended that the yellow window should be darkened by means of two folds of yellow tammy, a kind of woollen cloth. Now he (Mr. Osborn) imagined that if this was done it would be so dark in the room that nothing could be seen but the plate when in close proximity to the window, the result of which would be a dire upsetting of chemicals, &c. He had his dark room lighted by a window, which was two feet square, and was simply covered with two pieces of light yellow paper, and he had never had a single streak or stain in negatives caused by the light which came through that window. Orange glass not of the proper tint might cause stains in the negative; but if it was of the proper quality, and tested, as it ought to be in every case, with sensitised paper, so as to prove that it decomposed all actinic light, there would be no need to fear stains and streaks from that cause. In his opinion, the principal cause of stains was the want of cleanliness—a sin to which many amateur and professional photographers must plead guilty. If everything was kept scrupulously clean, the bath filtered, and everything in the highest state of purity, he did not think there would be much need to fear stains of any description. There were several methods of producing stains, such as the insufficient immersion of the plate in the bath; even if drawn out before the iodide of silver was properly formed, and then put in the camera, it was extremely probable that oily-looking streaks would be produced on the plate; but then that stain would be produced in the camera, and not in the dark room. In washing a plate in the bath care should be taken that it was properly drained before placing it in the camera, as, if this was not attended to, a quantity of the silver would fall to the lower part of the glass, and either in drawing up the slide or putting it down it was probable that a splash would be caused, which would produce streaks on the plate, or else the silver would sink into the wood, and form a nucleus for future stains. Insufficient exposure was also a cause of stains, as in such cases they were frequently obliged to use the developer to such an extent as to produce stains that would otherwise not have been visible. Dirty fingers were prolific causes of stains, as in preparing many plates, if great care was not taken, a little streak would rise from the thumb, which, if not perceived, would gradually carry itself almost half way across the plate. Stains might be caused by the iron developer used being too strong, and by an improper method of development, which caused much trouble to amateur photographers. The method of development was, in his opinion, the most important part of the photographic process; and so few people understood how to bring out a picture under any circumstances of difficulty by development, that it might be said to be one of their bugbears. The use of a pyrogallic developer too strong would have a similar effect to the iron developer, but not to so great an extent. In washing after development he had seen some amateurs who simply slushed one end of the picture in water and then put on the cyanide, when of course the picture was covered with marks. When the cyanide was too strong it was apt to cause stains; and, being poured on before the iron developer was sufficiently washed off, it produced a sort of Prussian blue which inevitably stained the negative. He had mentioned those few points to show that there were a great many other reasons for stains in the negative besides those which had been given by their friend, Mr. Thomas, and with the hope of exciting a discussion.

Mr. Turner said his dark room was lighted with bare yellow glass, and he did not find that it caused stains or streaks upon his negatives. In his opinion the chief cause of stains was not immersing the plate long enough in the bath, but that did not happen in the developing room. If light got into the camera it caused stains somewhat similar to those caused by want of sufficient immersion in the bath.

Mr. Johnstone said he was sorry that no photographic journal should point out what description of glass ought to be used in lighting the dark room. It had been found out years ago that the only glass proper for that purpose was that prepared with silver—glass stained with copper would not stop the actinic light. Some sixteen years ago he got two kinds of glass—one stained with silver and the other with copper; and, though there was very little difference in the colour of the two, the former decomposed the actinic light in passing through, and the other did not.

The Chairman said that some yellow glass would stop actinic light when placed in a certain position—say looking to the north—but when exposed to the sun would admit it.

Mr. Plante said there were a few remarks in Mr. Thomas's paper on the various kinds of collodion, which was a very important point; and it was also stated that the light given off from the objects to be copied impressed the first atoms of the sensitive film, and that the first atoms only were affected in the camera. Mr. Thomas made it clear that in the dark room the stains occurred before the exposure of the picture, and not after. Now, with the translucent kind of collodion film this was a great annoyance, but in the creamy or opaque films it made very little difference, as the stains did not show through. He had often observed that the stain was in the picture, as it were, between two layers of collodion; but he had never before been able to account for it satisfactorily.

Mr. Johnstone said it appeared clear to him that in the daguerreotype the first atoms of the iodised silver absorbed the whole of the light, which afterwards went on penetrating deeper and deeper; but in the collodion film he did not believe that such was the case. He found that, if he placed a plate in a bath rather highly charged with ether and alcohol, left it in the proper time, and then moved it about in the bath, so as to free it from all greasiness, but exposed without wiping the back of the plate, he often got perpendicular streaks in the background of the picture, caused by the contact of the dipper.

Mr. Turner suggested that this might be caused by light in the camera.

Mr. Johnstone stated that if in varnishing a negative any of the varnish got on the back of the plate, it caused a dull mark on the face corresponding to the varnish on the back; and, though they might rub the latter off, still the dull mark would be left on the face.

Mr. Plante suggested that this might be caused by the glass being porous, and absorbing a portion of the varnish.

Mr. Brown was of opinion that it was caused by an unequal ratio in drying, the evaporation not being so rapid from the place where the varnish was opposite as in the rest of the plate.

Mr. Johnstone said he believed that Mr. Thomas was right up to a certain point, as if any actinic light found its way into the dark room, and the plate when lifted out of the bath was exposed to it, certain filmy lines would form and be left upon it, which, when in the camera, would be more intensified than the rest of the surface, and stains be thus produced. Much care ought to be taken with regard to the proportion of alcohol and ether in the bath, as the contrary was a very frequent cause of stains.

A conversation then ensued on the subject of boiling the bath, after which the meeting adjourned.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

In our number for April 15th we gave the Annual Report of the Council as presented to the meeting held on the 10th April. The report of the subsequent proceedings of that meeting, through an oversight, only reached us on the day when our last number was at press, consequently too late for insertion on May 15th. We now complete the report of the meeting held on the 10th April.

The future working of the Society and the new and amended rules formed the subject of a lengthened discussion, which terminated in Mr. Heywood remarking that, inasmuch as the past management of the Society had devolved entirely upon a few members of the Council, who were no longer willing, if unassisted, to bear that responsibility—and the unusually thin attendance on that evening confirmed them in the opinion that such co-operation would not be forthcoming in future—he thought that the best course would be to dissolve the Society, and concluded by moving a resolution to that effect.

The Chairman (Mr. Griffiths), in putting the resolution, observed that he did so with great regret, as, from the enthusiastic feeling exhibited at the last meeting, he had anticipated for the Society a long and successful career. If one circumstance more than another could tend to discourage and damp the ardour of a few whose anxiety and solicitude for the success of the Society had always been conspicuous, it was to see so

few of the members present on an occasion like that. He approved of the resolution, as, under the circumstances, he did not see that any other course was open to them. He was not without hope that, if the resolution was carried, those members whose sympathies with the art were undoubted would meet for the purpose of reconstructing the Society upon a basis more in consonance with their wishes.

Mr. Hooper, Mr. Sheard, and other members, spoke in favour of the resolution, which was ultimately carried, and the meeting terminated.

At a preliminary meeting of a few members of the late Society, held on the 9th ult.—Mr. Hooper in the chair—it was resolved to re-form the Society.

On the motion of Mr. Griffiths, a draft code of rules having been submitted and approved of, the election of officers took place by ballot, and resulted as follows:—

President—John Heywood, Esq.
Vice-President—W. Griffiths, Esq.
Hon.-Sec.—Mr. Chas. Adin.
Treasurer—Mr. Hooper.

Council.

Mr. Sheard, | Mr. Whaite,
,, Radcliffe, | ,, Archer.
,, Wardley, |

After further preliminary business, the meeting was adjourned until Thursday, June 13.

Foreign Correspondence.

Paris, May 27th, 1861.

In a preceding letter I spoke of the stereoscopic views brought back from India by Major Gordon. At the last meeting of the Photographic Society, on Friday, the 17th instant, another amateur, Count de Nostitz, presented a collection which is also very interesting. It is an album depicting the landscapes and inhabitants of the Caucasus. Enchanting women, whose personal beauty is enhanced by their picturesque costume; manly faces, whose energetic expression materially leads our thoughts to the difficult struggle which the Russians have had to maintain against those sturdy mountaineers. Schamyl and his family figure in this interesting gallery.

The principal communications made at this meeting were descriptions of the experiments which M. Martin and the Abbé Laborde have been severally following out. M. Martin, who has been studying photographic collodion, has ascertained that most of the accidents which interfere with the success of negatives arise from the nature of the collodion, and especially of the bodies entering into its composition. Thus, among the iodides, he marks out two sorts which are quite distinct:—those whose oxide is soluble in alcohol, and those whose oxide is insoluble; as, for instance, the iodide of cadmium. Iodides of the first kind are to be rejected. He advises that iodide of ammonium, in solution at one per cent., should be poured into the ether before the cotton is dissolved therein. The silver bath he recommends is at ten per cent., and contains a little nitric acid. The developing solution is composed of one gramme of pyrogallic acid in fifteen cubic centimetres of acetic acid and five of alcohol. When about to operate, five per cent. is poured into the water. This developing solution is very convenient for travelling; the presence of the alcohol preserves the limpidity of the solution, permits it to penetrate farther into the film, and prevents that too rapid mixture of the reducing agent and the sensitising bath remaining on the image which produces spots. A developing solution of sulphate of iron at twenty per cent., containing one per cent. of acetic ether, has the property of moistening the whole film thoroughly. For the sake of greater rapidity, nitrous ether may be employed instead of acetic ether; but then there is the inconvenience of the spots again.

M. Martin has made the following modification of M. Moitessier's method for obtaining positive pictures by transparency:—He developes with sulphate of iron, washes, and then pours upon the image bichloride of mercury, which fixes upon the silver. A solution of hyposulphite of soda, saturated with nitrate of silver, is then poured upon the glass. By this means very powerful darks are obtained. For fixing, the ordinary hyposulphite is employed.

The Abbe Laborde recommends that one gramme of free iodine should be added to silver baths saturated with iodide by use. In this manner may be prevented, he says, that spontaneous reduction which takes place without the luminous action, and which forms a veil over the image. Solarization is also avoided.

M. Gaumé, of Mans, sent several negatives obtained upon paper prepared with gutta-percha, and then albumenised with albumen and dextrine, according to a method which he has already mentioned.

M. Poitevin's processes, published in the last number of the *Bulletin*, have been experimented on by a Committee appointed for that purpose. Count Aguado, to whom the report of these experiments was entrusted, declares that M. Poitevin's processes and manipulations have been deemed very practical, and have given very good results.

In the present letter, I will only refer to our Exhibition of Photography to mention two pictures which MM. Bisson Brothers have added, and which form part of a series of artistic reproductions intended principally for English amateurs. They are two clever compositions representing Shakspere and Byron. The original designs have a very fine character, and are traced in excellent condition for photographic reproduction. The album will contain all the great names which figure in the history of literature, philosophy, and the arts. Milton, Thomas Moore, Walter Scott, Luther, Calvin, Dante, and Tasso, will appear shortly, The collection will be interesting, on account both of the subjects contained in it, and of the names of the artists figuring on the designs, such as Gustave Doré, Nanteuil, Hamman, &c.

A new application of photography is at present much employed at Paris. Numa Blanc had the idea, a year or two ago, to reproduce the actors and singers of the Opera Comique and the Theatre Lyrique in their principal characters. Thus, all the personages of the "Fanchonnette," of the "Pardon de Ploërmel," and of "Quentin Durward," had been pourtrayed as they appeared on the stage. At present the idea is applied to the principal pieces played at our theatres. Everywhere are to be seen little play-bills announcing such-and-such a representation, and exhibiting portrait cards of the chief characters of the drama or vaudeville in question.

It is needless to reply here at length to M. Negretti's letter, though my name appears in different passages of it. I was the interpreter of M. Ferrier, as I shall always readily and rightly be of any photographer who applies to me. I have not to judge the question in itself; only I have (and use the right) to observe to Mr. Negretti that he might advantageously have struck out from his reply, many useless things, the sole effect of which is to envenom discussion. M. Ferrier's greater or smaller fortune is quite irrelevant to the matter; and the insinuation with respect to the advantage which that gentleman has found in his association with M. Soulier, is, to say the least, out of place. It is very evident that, if MM. Ferrier and Soulier had not considered their partnership useful, they would not have entered into it. The modifications also that this partnership may have introduced into M. Ferrier's processes are quite aside of the mark, for it is the *old* method that is in question.

Were Mr. Negretti more familiar with the pen, he would feel that to leave it to its true office of instructing and convincing is far better and more pleasant than the endeavouring to inflict with it unnecessary wounds, especially when our subjects are science and art.

ERNEST LACAN.

New York, May 11, 1861.

Since my last, New York has become very quiet: the great war excitement has given place to the *semblance* of profoundest peace. The bow cannot be always bent: we seem to know the value of peace and quietness. Our whole army marching down Broadway would not now receive the attention which greeted the single regiments only two weeks ago. War business has lost its attractiveness for the sight-seekers, and is given up to the regular professors and their apprentices. People have great confidence in Uncle Sam—meaning now "Uncle Abe"—for he has a long purse (he spends two millions every day) and a great many friends.

Possibly I may have the honour shortly to chronicle some useful application of photography for the war business—as, for example, lengthy and important despatches executed in micro-photography, and transmitted under such concealment as would only hide a mustard seed. Of course we have plenty of photographers who could manage their part of the work. And such applications of photography are probable enough, for our fighting men are enterprising. In Washington are already two balloons for the service and yesterday a terrible steam-gun, on the road to "Dixie," was seized. I dismiss the subject of the war with the announcement of the supposed truth, that nobody has yet been hurt in battle: it is only a score or two of vulgar rioters who have been shot.

Yesterday I called on my old friend, A. A. Turner, who has recently become quite eminent in photolithography. Mr. Turner was first in the field as a successful collodion photographer, and

his ability was so highly appreciated that, for some years, he received a salary of fifty dollars per week, as a practical operator. Three or four years ago he visited Europe, in the hope of further perfecting himself in the art. Since his return he has devoted himself exclusively to photolithography, and at the present time merits to be considered the highest authority in that interesting branch of our art. His establishment is conducted on a large scale, and with facilities for the execution of any kind and extent of work that might be desired. I have little doubt that Mr. Turner has produced more photolithographs than all the rest of the world together. The single work of greatest magnitude which he has executed is a *fac-simile* reproduction of a large quarto English book, entitled *The Foreign Tour of Messrs. Brown, Jones, and Robinson.* One thousand copies of the book were printed, and found ready sale at three dollars per copy—one-half the price of the English edition. The larger part of Mr. Turner's ordinary work is on maps and views of buildings.

The fact seems not to be well understood in Europe that the earliest attempts at photolithography were made in America, and precisely by that bichromate process which is most approved at the present day. I have seen a relic of a successful experiment which I have very satisfactory evidence to believe was made on July 2nd, 1840, by Joseph Dixon, then at Taunton, Mass. We feel aggrieved that Mr. Dixon's claims have been, as we think, persistently ignored by the European editors and authors in photography, in the face of evidence which has been widely published here. Mr. Dixon holds a prominent place in *our* history.

Photolithography has also been creditably carried on in Boston, by Messrs. Cutting and Bradford, and by Mr. Rehn, of Philadelphia. The latter gentleman has published a very valuable series of microscopical illustrations, for which photolithography seems peculiarly applicable.

CHARLES A. SEELY.

New Books.

The Principles and Practice of Photography Familiarly Explained, in a Course of Easy and Familiar Lessons. By C. JABEZ HUGHES.

(London: Published by the Author, at 379, Oxford Street.)

Of all the troubles to which a competent author is liable in writing an elementary work in any branch of science, there is perhaps not one so perplexing as the judicious selection of the point whence to begin. "Give me but a point to stand on and I will move the whole world!" was the demand of Archimedes. "Give me but a point to start from and I will convert the tyro into the accomplished photographer!" might our author exclaim if he did not understand, or only half understood, his calling; but, instead of this, as a practical man, which he is, he chooses a point and then moves onward, with steady progress, till he brings his reader safe to the terminus.

In the ranks of intending photographers every grade of intelligence may be found, from the man of science down to the thorough simpleton; but, as Mr. Hughes knows too well of what stuff good photographers must be made, to have any hope of recruiting their ranks from the last-named class, he very wisely abstains from troubling his head about them, and commences with the assumption that all his readers are possessed of ordinary intelligence, and not altogether ignorant of common things. More than this he does not require, though it is a task of no common difficulty to state in simple and intelligible language all that is required by the unlearned, and, at the same time, not to offend the taste of one with a more cultivated mind. If the author has not thoroughly accomplished such a task, it is simply from its being impossible; for we cannot deny that he has made the effort to do so, and that he has accomplished more than we have found in most other works in this direction.

The work is divided into two unequal parts. The first, containing about four dozen pages, is written in a colloquial style, as allowing of more familiarity of expression; the second part, of about twenty pages, contains a few useful hints adapted only to the advanced student, in which a more terse and conventional style is employed.

In all that relates to the practical part of photography Mr. Hughes is a safe and experienced guide. Some few of his theoretical opinions may be open to question—*e. g.*, those relating to copying and enlarging; but even these are expressed without dogmatism.

There is one point in particular upon which we cannot express too strongly our hearty commendation: though written by one who deals in photographic apparatus and materials, there is a total absence of "*shop*" in its pages; and so far from its containing any hint or suggestion that *good things* are to be obtained only at the author's establishment, the said establishment is not once named in the book, excepting on the title-page as the place of publication, nor does it contain advertisement or trade catalogue of any kind.

The commencement of a chapter on "Defects, Failures, and Remedies," is thoroughly in the author's own peculiar semi-jocular style that is unmistakeable, and which would certainly have betrayed him even had he desired concealment; and we are pleased to notice that the advantages derivable from a constant perusal of the photographic journals have been specially commended to the attention of the author's pupils. We have little doubt that this pamphlet is destined to pass through many editions, and are equally convinced that in each succeeding edition any real advance made in the art since the previous issue will be duly chronicled.

In conclusion, we quote the following as samples of what the book contains:—

I propose, in a simple and familiar manner, to introduce you to the wondrous and fascinating art of photography. I take it for granted that you are entirely unacquainted with it, and that you are very anxious to learn. Before proceeding, however, to the practical portion, I wish to impress on your mind a few of the leading principles. I would willingly omit this part of my instruction; but I see so many amateurs, and even professional photographers, who get into difficulties, because they do not commence with a clear idea of their subject, that despite your natural impatience to get to work, I must beg your attention to this introductory chapter, as my desire is that you should not only practise the art, but that you should understand it too.

If you acquire a knowledge of the general principles, you will not only avoid those difficulties that so frequently embarrass young photographers, but every step in your path will be rendered pleasant and interesting. Even your very failures, when you have a clue to them, instead of disheartening you, will be stimulants to improvement—stepping-stones to success. I wish you to work not blindly and impatiently for the result, viewing all the intermediate operations as irksome, but I want you to be interested in each stage of the process—to know why you have to do these things—to understand exactly when they are done properly—to be able to explain to any intelligent person the reason you do this and that, and what the result would be if any one thing were done differently.

If you follow the art as an amateur, taking it up as a source of pleasure, this is the only course you can adopt; for, by making each step a labour of love, whether you succeed or fail, you will certainly secure interesting amusement, and, by perseverance, you cannot fail to become sufficiently expert to have pleasure in blending your new acquirement with your other tastes and occupations—depicting bosom friends, multiplying choice engravings, copying rare works of art and vertu, as well as gaining health and vigour by rambling among those charming hills and dales to which your camera will invitingly entice you.

And should you encounter those frowns of fortune from which we are none of us exempt, and have to seek other means of support than those you now happily enjoy, you may discover that you have made no unprofitable investment of time and means; for the period will never occur when a skilful and intelligent photographer may not so far profit by his knowledge as to gain a respectable subsistence.

If, however, you aim at once at being a professional, no matter what branch you attempt, unless you determine thoroughly to understand it, you have but an indifferent prospect. The days of rule-o'-thumb photography are rapidly passing away, and to avoid descending to the level of a mere black-fingered mechanic, you must study hard to master your profession—the scientific part first, the artistic afterwards; and by their successful union you may look forward not only to competency, but even fame, as a reward for your well-applied talents.

Hoping that I have convinced you that, whether you follow the art for pleasure or for profit, by studying its general principles you will secure a certain reward, I pass on to the subject itself.

And, from the manipulatory details—

HOW TO TAKE NEGATIVES BY AN EASIER AND MORE CERTAIN METHOD.

The plan of taking negatives already described is the usual one, and when practised by experienced operators produces the most perfect results; but there is another method getting into general use by which good negatives can be obtained with greater uniformity.

I recommend you to commence with the one I am about to describe in preference to that which I have already given; as, from the progress which I may suppose you already to have made with positives, you will find this very simple and easy.

A positive collodion giving a dense creamy film is required; if the one you are using is not of this character, mix an equal quantity of any good negative collodion with it, and after settling it will be ready for use. Collodionise your plate and sensitise in the usual bath; expose in the camera about half as long again as for a positive. Develop with the usual positive developing solution, only continue the action rather longer—that is, until all the details are distinctly seen; then wash well. The picture in this stage is like an over-exposed and over-developed positive, and on looking through is seen much denser than one, but not intense enough for a negative, but every detail must be distinctly seen; next pour over the plate as much of the "Summer Developing Solution" as it will hold:—

Pyrogallic acid	5 grains.
Citric acid	2½ ,,
Distilled or boiled rain water	5 ounces.

When this has thoroughly mixed with the water on the plate, pour it back into the measure glass and add a few drops of the nitrate of silver solution to it, mix, and pour over the plate; it will speedily begin to intensify, that is, the silver will begin to be deposited over the various parts of the image *in the ratio that the light has acted.* Continue the development until the requisite intensity already explained is produced, then wash your plate and fix with either the cyanide or hyposulphite fixing solutions.

Negatives very soft and full of detail can be obtained by this process, when it would be extremely difficult to produce them by any other means.

Although it is not quite so important to obtain the same exactness of exposure in the camera in this as the preceding method, yet there is a certain margin beyond which you must not go. Nearly the same precautions apply as those I have already named.

If the various parts of the picture intensify in an equal manner, the dark drapery becoming nearly as dense as the head, and when fixed the whole plate is drab, and very little appearance of positive image, the exposure in the camera has been too long; but if the image becomes dense only in the parts reflecting most light, and even then takes the silver reluctantly, and when fixed shows as a good positive, the exposure has been too short.

The plate must be varnished in the manner already described.

Correspondence.

RESIN PROCESS EXPERIENCE.

To the EDITOR.

SIR,—Having recently exposed a dozen ten by eight resin plates with tolerable success, I would observe, for the benefit of those practising this process, that those dried off at the fire, after surface draining, produced more intense negatives than those spontaneously dried; those developed with the addition of citric acid were of a blue-black colour; and those by acetic acid alone in the developer were of a good brown printing colour.

I washed in a flat dish, repeating the *changes of spring water* till all milkiness and oily stains had disappeared off the plate, then drained on very clean blotting paper. The exposure was from one and a-half to five minutes, varying the stop with the subject and distance—Ross's

orthoscopic lens. Nothing but collodion was on the plates; but, as the subjects were some sixteen miles away, I took the precaution, before commencing to develop, to paint the edges of the plates one eighth of an inch all round with benzole varnish, which secured the film *in each case perfectly*. Of the twelve exposed plates I have eleven decent negatives, and one spoiled by the light in changing in the "bag."—I am, yours, &c., CHARLES JONES.

Birkenhead, May, 1861.

HOT WATER PROCESS.

To the EDITOR.

SIR,—May I, through your columns, draw the attention of the Experimental Committee of the South London Photographic Society to a modification of the albumen process, which, judging from their report, they have overlooked, viz., the *hot water*. I have tried most of the dry processes, and have obtained good results by nearly all. The hot water plates which I have now tried for three months give, in my hands, pictures certainly not inferior to those yielded by any of the other dry processes, and surpass them all in facility of preparation. The collodio-albumen plates require resensitising, a second washing, and very long development—the Fothergill a second and most careful washing, and are very liable to stains. Plates prepared with honey, oxymel, gum, tannin, &c., must first be coated with gelatine. I simply wash, coat with albumen, and, without any draining, dip into water nearly at the boiling point. The plate is then finished. Besides facility of preparation, this process has two other points in its favour—freedom from stains and keeping properties. I must confess that, on first reading of the process, I had small hopes of it, as I fancied the albumen would be coagulated *unevenly;* but I found on trial that my fears were groundless.

I send you two pictures taken by the process, that you may judge whether it is worth drawing the attention of the Committee to the subject. They are chosen to show its power of rendering difficult subjects, rather than as the best pictures I could send. The plates on which they were taken had been prepared a month. No. 1, *Tabley Old Hall*, I was afraid would be a failure. The grass and trees were in bright sunlight, while the hall, covered with ivy, was in deep shade, rendered deeper at the right-hand corner by the overhanging lime trees. I regret I could not have the flagged path in front—which spoils the picture—watered. No. 2, *The Chapel, Tabley Old Hall*, has a plentiful crop of daisies in front, and a tree covered with white blossom.—I am, yours, &c., TOM JEFFCOATT.

[The proofs received show that the negatives are excellent: the details are all thoroughly preserved.

If our correspondent will favour us with *full* details of his mode of working we will lay the matter before the gentlemen indicated, and have no doubt that they will report thereon. Particulars required are:—Kind of collodion, strength of albumen solution, how dried after immersion in the hot water, developer, and mode of development. These details have all been published, it is true; but the point is to state precisely the minutiæ of the preparation of the plates from which the *proofs* received were printed.—ED.]

DIFFERENCES IN COLLODION, &c.

To the EDITOR.

SIR,—You have several times before given me advice when in difficulty; therefore I again appeal to you to help me in the following:—

I have been working of late with A——'s collodion and bath, and his prescribed formula for developer—three grains pyrogallic acid, one minim acetic acid, and one ounce water—diluted to one third of its strength when required for use. I experience great difficulty in getting any but very transparent skies in all lights. This with B——'s collodion, generally considered inferior, and my own bath and developer, never troubled me. I think there must be too much acid in the developer. Am I right; and what do you recommend as the best ordinary negative developer? Also, I find A——'s collodion *very* difficult to keep on the plate during the washing subsequent to developing and fixing: it has an unaccountable (to me) tendency to float away.

Another thing: how can I preserve plates moist for an hour or so, so as to be able to prepare say half-a-dozen plates one after the other, take them half-a-mile, and return to develop immediately? Would honey answer? or is there any other simple plan efficacious for so short a time?

Your kind attention to these queries will much oblige yours, &c.,
A PUZZLED AMATEUR.

[The manufacturer of the collodion indicated by A—— has several different kinds for different purposes; possibly you may not have that kind most suitable for landscapes. A portrait collodion requires to be more transparent than one suitable for landscapes.

To keep plates sensitive for twelve hours or so, we know of nothing better than syrup made of distilled water three ounces, honey one ounce, filter. Flood the plate with this after its removal from the bath, and keep it flowing backwards and forwards until all greasiness has disappeared. You will find the sensitiveness very little impaired, and the density will be considerable.

You may add a little of the above syrup to your developer for a *wet plate*, when your density is insufficient. Let your collodion set well on the plate before immersion. But, if you find B——'s collodion suit you best, why not stick to that?—ED.]

FADING OF DEVELOPED PRINTS.

To the EDITOR.

SIR,—Mr. L. Smith has lately given to the photographic world a process of printing by development in which is recommended a weak fixing solution, because, I suppose, a strong one would nearly destroy the print altogether. Now I firmly believe that more prints fade from want of proper fixing than from want of after washing. As Mr. L. S. has not seen any faded ones by development printing, I enclose one or two to you, Mr. Editor, which, with the substitution of gallic acid instead of pyrogallic, have been printed as L. S. directs. They were sent to me as specimens of development printing, and warranted permanent: they faded so quickly in the light that I removed them to a portfolio in order that they might still linger on. But no, they were not fixed: the hypo. solution used was too weak to fix them, and the extra after washing they had only helped them on to destruction. The gentleman who sent them strongly advocates development printing, and gives his prints plenty of after washing: he does not tone them except passing a hot iron over them to finish these permanent prints. If you think proper, Mr. Editor, I can send you a few prints fixed in different proportions of hypo., and some particulars respecting the washing of them, &c. They have been exposed in all sorts of weather, these past eighteen months, in a specimen frame: they will go far to support the opinion I have expressed.—I am, yours, &c.,
Swansea, May 25, 1861. THOMAS GULLIVER.

[There is no question about the prints received having faded, but they have evidently been very good originally. Mr. L. Smith does not advocate the use of imperfect fixing; but, proposing to use a new bath of hyposulphite of soda on each separate occasion, does not think it needful to have it very strong. We shall be happy to receive the particulars offered by our correspondent, though we do not agree with him that the fading of the prints received is due to imperfect fixing.—ED.]

ANSWERS TO CORRESPONDENTS.

ERRATA.—In consequence of the late hour at which we received a portion of the MS. for our last, we have to correct the following:—In page 182 of last number, second column, twenty-third line from *bottom*, for "finished creature" *read* "finished *creation*." In page 184, first column, seventeenth line from *top*, for "you and I" *read* "you and *me*." In the same column, fifteenth line from *bottom*, for "or £4 to £8" *read* "or £4 8s. 0d."

T. CLARKE.—In our next.

BENJAMIN.—No need to do more than send a request as directed.

C. J. JONES.—See paper on the subject of your inquiry in the current number.

ANXIOUS.—"Though it tarry, wait for it." It will surely come: it will not fail.

IMPATIENT—See Mr. Lyndon Smith's paper *On Development Printing*, in our last.

F. M.—We perceive no objection: do as you propose, and we will give our opinion, as you desire.

F. J.—A little stronger solution of nitrate of silver upon which to float your paper will impart additional vigour to your prints.

C. P.—We are making experiments on the subject at the present moment: those hitherto completed are very satisfactory.

F. MORDEN.—A very little more exposure would have impressed the details in the darkest parts. The folds of the dress are "hinted at," if not actually expressed in the proof.

R. L.—We have never heard of the fault of which you complain, and cannot at all comprehend how it is possible for it to arise. Send further particulars, and we will try to help you.

FLAT.—We shall have an article upon the subject in our next. The confusion is principally of words and names; though we confess that it appears very absurd to us to ask such a simple question—that is in public.

R. MUTRIE.—The paper to which you refer was merely an enormously expanded advertisement. The article dilated upon is certainly *very* good; but it has no pretentions to occupy so very much valuable time as was devoted to it.

S. JONES.—A. B.—T. WHEELWRIGHT.—C. LAKE.—R. M.—OLIVER.—You have nothing to do but to fill up the form, put on a stamp, and post it; afterwards you will be communicated with in due course, with all particulars not included in the prospectus, some of which are not finally arranged.

W. G. G.—Supposing the same area to be covered by each of the lenses, then the shorter the focus the more of the subject will be included; and generally the quicker will the image be impressed, but the greater will be the amount of distortion at the edges of the picture. On the other hand, the longer the focus the larger the *scale* upon which objects are delineated, and consequently the less there is included in a given space; but the marginal distortion will be less. We think you will find the four inches and a-half suit you best for general purposes.

W. CLARKE.—Your portable tripod for the operating room we will notice in our next, with a cut. The paper received has all the albumen removed by your solution, hence we should expect to find it alkaline. This expectation is the more probable because we find that the deposit, of which you sent a sample, is soluble in *ammonia*, and also in *nitric acid*. It is very impure, being contaminated with much organic matter, and is either carbonate or oxide of silver. The only thing for you to do is to precipitate the whole in the form of chloride, by the addition of solution of salt.

P. S.—The fault complained of is neither in your process or chemicals, *but in the cleaning of your glasses*. We have no doubt that you have taken great pains with this operation; but are you certain that the cloth or leather with which you give the *last* rub to the plate has not been washed with soap? Wash your cloth in soda and water only, then rinse well, and try again. Your proof has been left *too long* in the toning bath, which is its only fault. Remove it as soon as it has acquired the purple tone: if it approaches too near to a blue it will always, when finished, appear like that received.

C. E. BUSK.—"Depth of focus," or rather what is so called, in a lens is about the worst quality that it can possess; because such can only be apparently obtained by absence of proper correction of the spherical aberration, or, in other words, by preventing the formation of a "circle of *least* confusion;" consequently every such lens must of necessity be slow, and, what is worse, deficient in definition. A lens of comparatively small diameter can only be made to cover *evenly* a large area by thus degrading its defining power—that is to say, by reducing the sharpness of the central pencil the difference between it and the oblique pencil is not quite so apparent. We strongly advise your having nothing to do with such a lens. We may remark about the noted maker whom you mention that you may safely take the lens *one size smaller* than that he quotes for the stated plate upon which you work.

*** SYDNEY SMYTH *On the Solar Camera*, and several other articles are, from press of matter, postponed till our next number.

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 144, Vol. VIII.—JUNE 15, 1861.

Sharpness.—Some time ago our facetious friend, *Punch*, entertained the world with a glimpse of the social amenities prevalent in the mining districts. An illustration was given of a mild, peaceable-looking gentleman passing quietly by a couple of miners lounging against a gate, the following dialogue being supposed to pass between the latter:—

First Miner: "Who's that?"—

Second Miner: "Stranger."

First Miner: "Then heave half a brick at him."

We have had this illustration forcibly recalled to our memory by perusing a paper recently read at one of our suburban societies by a gentleman who has deservedly acquired some reputation as an art-instructor, but who has not a little surprised us by such a display of his want of familiarity with science as to put the question—"Sharpness: What is it?" and we come to the conclusion that he has been perpetually heaving half-bricks at "sharpness" simply because it was a stranger to him. Now although we perceive, from certain indications to be found in the paper quoted, that a slight acquaintance has at length been sought with "sharpness," nothing approaching to intimacy has hitherto been attained.

The fact is, that certain words and phrases have been employed in common both by men of science and by artists in a technical sense, but each class applying them to the expression of totally different ideas—*e.g.*, "sharpness," "focus," &c.

We beg emphatically to assure the author of the paper to which we have alluded that amongst opticians there is no doubt whatever as to the meaning of the word "sharpness" as applied to the image formed by a lens; that there is no connexion at all between it and "hardness," used in an artistic sense; and, further, that the word is by no means inappropriate to the idea intended to be conveyed, as we will endeavour to show.

From each point of a visible object rays of light proceed in every direction. A certain portion of these *diverging* rays being intercepted by a convex lens has the primary direction of each ray diverted, so that the whole of the intercepted rays are made to converge towards another point on the opposite side of the lens, which point is termed "the focus." Now, if these rays could be made to unite accurately in a mathematical point similar to that from which they proceed, there would be formed a *perfect* image of that point; and, if of that point, so also of all other points in the subject. It is therefore abundantly evident that the cone of rays meeting in such a point might not inaptly be compared to the very "sharp" point of a pencil carefully cut. If we were to break off the end of a lead pencil the "blunt point" would represent the section of the cone of rays formed by putting the object "out of focus." What sort of a *highly finished* portrait could an artist execute if he were to employ *only* a broken-pointed pencil? That he sometimes for convenience uses a pencil in this condition for a portion of his subject, so as to save labour by making one thick line do duty for half-a-dozen thin ones, is only analogous to the corresponding practice of the skilled photographer who knows that a well-constructed lens can only give a "sharp" image in one plane; and hence the better the definition the more artistic is the image produced, provided only that the instrument be applied with intelligence. Like the graphic artist who wants a fine pencil to make his delicate lines, so the photographic artist requires a lens effecting a maximum of definition—that is, giving a "sharp" pencil of light to make his fine lines; but also like his graphic brother using the blunted pencil (of light) to delineate the more unimportant parts of his subject.

We have been rather startled by the heterogeneous assemblage of names quoted as "authorities" on the question raised, and also strongly demur to some of the misinterpretations appended to quotations made. For instance: it is attributed to Mr. Robert Hunt (by implication) that he asserted an image produced by a lens under certain conditions to be "sharper" than that produced by the human eye. This is a proposition which, if made, we should flatly contradict. The image formed by the most perfect lens ever constructed must of necessity fall far short in "sharpness" to that in the retina, for the simple reason that, while the lens of the eye unites all the rays proceeding from any given point and of whatever colour they may be accurately in another point, there is no artificial lens that can accomplish the absolute coincidence of rays even of one colour in one absolute point, and still less so those of many colours. But we deny the propriety of the allegation against Mr. Hunt from the context of the passage quoted. His animadversions are directed against the improperly intense illumination of the objects pourtrayed. It is a well-known axiom that the more intense the illumination the greater is the depth of shadow. Hence by too intense illumination an offensive contrast between light and shade is engendered, and this, of course, produces the effect known by artists as "hardness."

What would be thought by the author of the paper respecting which we address these remarks if we were to assert that he taught his pupils never to point their pencils or sharpen their crayons? And yet by decrying sharpness this is practically what he is doing—evidently without being aware of it.

Here is another proposition which we dissent from *in toto*:—"Sharpness, as at present understood, has never been very popular with our best men."

Queries.—1. Understood by whom?

2. Who are our "best men?"

We will take the liberty of suggesting the names of two whom we recognise as amongst our best men, viz., Mr. Francis Bedford and Mr. James Mudd. That "sharpness" is both understood and thoroughly appreciated by them we have only to point to their works to prove; and if we see photographic landscapes "frequently" with the most distant objects most sharply focussed by other operators, we have only to rejoin that we "frequently" see the works of graphic self-styled "artists" frightfully out of drawing, and with every conceivable offence against correct taste. It is merely the assertion that there are pretenders and bunglers in every art in plenty; but they ought no more to influence the judgment we form of the capabilities of the art or the implements used in its pursuit in the one case than in the other.

The fact is, *that upon this point* the opinions of some of

the *quasi* authorities quoted are worthless, and they are all of a piece with a reason given by one of them for advocating the practice of taking pictures a *little* out of focus—because, forsooth, "it is so suggestive, and leaves room for the imagination!" How much more room for the imagination, &c., would a single sheet of paper with a few indistinct scratches leave does not appear to have struck this gentleman at all.

There is but a very small amount of truth in the assertion of Mr. Lake Price—"The parrot cry of sharp! sharp! which the ignorant in art raise, seems the main point aimed at." The truth is that, as a musician shrinks at a false note, so does an optician at an image out of focus; and, when some professional artists first began to show photographers how they should take pictures, those amongst the latter who also knew anything of the use of optical instruments were naturally enough disgusted with what was to them an unbearable offence. For, however fine the "composition" or perfect the "keeping," in nine cases out of ten the model pictures were valueless from being "out of focus"—none more so than those of Mr. Lake Price himself: witness one of the earliest pictures exhibited by him, GENEVRA, the subject being the burden of the ballad known as "The Old Oak Chest." That there were and still are many photographers who could take a "sharp" picture, but not an artistic one, we should be the last to deny; but, though we should attach absolutely *no* value to a photograph out of focus, nor to a "sharp" picture of a worthless subject, we cannot admit that this quality of sharpness has been exalted *at the expense* of art: rather let us say in aid of it.

To show how much an artist may yet learn about the question of "focus," as understood by the optician, we quote the following paragraph from the paper:—

The other day, being with my friend Mr. Simpson, the editor of the *Photographic News*, we were examining the effect of stops upon the image on the ground-glass. I took my station under the focussing cloth, with my eye fixed on the ground-glass screen, and Mr. Simpson changed stops the while. At every change of aperture, beginning with the larger and coming to the smaller, there was a clear distinctive variation in the character of the view, distant objects growing sharper and coming nearer, until at length an almost flat map-like appearance gradually became apparent. *Sharpness was everywhere, focus was nowhere, and space was annihilated.*

That sharpness could be *everywhere* under the circumstances detailed we *know* to be *impossible*—the explanation of the statement made being given by the author himself by his inquiry, "What is sharpness?" The remainder of his observations are accurate enough; but he is evidently not aware of the explanation and remedy for the defects noted. If upon each change of diaphragm he had *re-focussed* the view, he would (if the lens were a good one) have found that his foreground might have in *all* cases been made most distinct, though the smaller the aperture employed the *less indistinct* would have been the distant objects. Only focus properly, and there is no fear of distant objects ever appearing too near even with small stops, nor of loss of atmosphere from the same cause; yet are we by no means an advocate for the indiscriminate use of a small aperture.

We will explain the phenomenon witnessed. The lens, when used with a large aperture, has its "circle of least confusion" (focus) at a definite point from itself; but with a small aperture the place of the "circle of least confusion" is *further removed* therefrom; therefore, as the effective aperture of the lens is reduced, it follows that the focussing screen must, in order to keep the *same* object in perfect focus, be removed further back; and if it be *not* so adjusted, then a more distant object projects its image into the spot formerly occupied by that of a nearer one, which in its turn is "pushed off," as it were, to a spot behind the ground glass.

Seeing how the effect of mere change of diaphragms was tried, can we wonder that our author makes the following remarks?—

Yet we "stop down" our lenses to the smallest possible aperture, and bring all their powers of focus to bear upon the most distant portions of a view, in order to obtain *no focus*, and so ruin pictorial effect and natural truth. Sharp distances, as evidence of depth of focus, are mistakes only to be equalled by "white skies." Why, nearly all the poetry of nature lies in the exquisite sensations of the broad free air—the home of the glorious sunlight, and the boundless dwelling-place of the fetterless wind: the ocean of the universe, connecting worlds with worlds, and systems with systems: and we are to shut out this mighty element from our beautiful sun-pictures—are to push back our foregrounds, and drag forward our distances, and crowd them into a little white-washed dungeon, for the sake of "sharp distances" and "depth of focus." Truly it wont bear thinking of.

Truly it won't! And this brings us to another matter that we perceive has been, to say the least of it, a *particeps criminis* in causing the mystification about sharpness, we mean the quality that has been miscalled *depth of focus*—that *ignis fatuus* which leads its pursuer into a quagmire—that myth which has been exalted by ignorant, lazy, or designing opticians, and which science can prove to be *impossible*. The sooner photographers cease to seek lenses possessing this impossibility the less will they be likely to be troubled with indifferent instruments. The demand is born of laziness; for it needs but intelligent application of known laws to make any lens, *however good*, do all that is required in art, so far as the rendering of different planes in nature upon one plane in the picture.

The indiscriminate use of small apertures is a great mistake. We advise, as a rule, the use of the *largest* aperture that each subject will permit, and to "stop down" the lens only enough to prevent the more distant parts from appearing too indistinct. Too small an aperture obliterates relief; and, as a rule, the larger the aperture that can be used the more "plucky" does the resulting picture appear; but perfect roundness is quite compatible with perfect sharpness.

We find our remarks have run to a great length, such as we never contemplated when commencing this article; but, as the paper on which they are founded was put forth principally to "elicit discussion," and that there was much misapprehension to remove, we have been unable to condense our observations within shorter limits. If in any of them we may seem to have overstepped the limits of calm remonstrance, it is because the subject is one upon which we feel strongly; but we would not voluntarily give offence to any, and least of all to the gentleman whose communication has formed the basis of our dissertation.

AMATEUR PHOTOGRAPHIC ASSOCIATION.—It is with considerable pleasure that we notice the very enthusiastic manner in which the Amateur Photographic Publishing Association has been received in all directions. We have amongst our correspondence published two out of very many communications received by us with reference to the subject, as the replies therein contained will serve for several others. A steady stream of adherents has set in from the first announcement, which has continued uninterrupted up to the present moment; and already the "process of disinterment" of fine and interesting negatives (to employ the phrase of the Honorary Secretary) has commenced, many of which have been sent in.

PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION OF 1862.

WE regret to have to report that since our last issue but little apparent impression seems to have been made on the Royal Commissioners by the very pertinent letter addressed to them by Sir Frederick Pollock, as President of the Photographic Society, in which he pointed out the grave objections to the existing classification of photographs adopted by that body.

To this letter, however, the Commissioners returned the following unsatisfactory reply, which we think our readers will agree with us in saying may be accurately described by the single adjective "evasive:"—

Offices, 454, West Strand, London, W.C., May 16, 1861.

SIR,—I am directed by Her Majesty's Commissioners to acknowledge the receipt of your letter of the 7th instant, to which they have given their most careful consideration.

The views of the Council of the Photographic Society seem to be based on a misapprehension of the intention of the decisions published by the Commissioners, as there is nothing in those decisions which would imply that Photography may not be placed either in a separate room or in juxtaposition with engravings, or any other analogous and suitable class of objects.

It is the wish of the Commissioners to do their utmost honour to the Exhibition of Photography, and the scientific instruments essential to the practice of that art. With

this object they have removed it from the subordinate position which it occupied in 1851, and have constituted it a separate class, to which special space will be allotted.

They hope to induce all the exhibitors in this class to assemble together in one apartment all their photographic apparatus and photography, so as to illustrate fully the state of photography as practised throughout the world at the present time.

Her Majesty's Commissioners entertain no doubt that this explanation will be sufficient to secure the valuable co-operation of the Council of your Society in the forthcoming Exhibition, as requested in my letter of the 26th ult.

I have the honour to be, Sir, your obedient Servant,

The Right Hon. Sir F. Pollock. F. R. SANDFORD, SECRETARY.

Upon the receipt of the above the Council of the Photographic Society assembled together, and after mature deliberation decided upon forwarding the following counter reply :—

Court of Exchequer, Westminster, May 24, 1861.

SIR,—The Council of the Photographic Society have been assembled, and have had laid before them the letter which I have had the honour of receiving from Her Majesty's Commissioners through you.

The Council is most anxious to concur in whatever may promote the success of the Exhibition, either by assisting in the appointment of a Committee or in affording the most zealous co-operation; but they do most earnestly hope that their claims will be admitted and their request be complied with—viz., that their apparatus may not be exhibited in the same room with the results which arise from the use of them.

As a science, Photography, like every other science, is incapable of being exhibited. But when embodied in the artistic results with which every one is more or less familiar, Photography as an Art is capable of contributing to an Exhibition matters of the greatest and most universal interest, embracing every variety of object which can gratify curiosity and afford pleasure. It would be most painful to the Council to have blended with these results the mere apparatus which they use as tools—neither could throw any light upon the other; and I am desired by the Council to press this upon Her Majesty's Commissioners, and to solicit an interview, when the Council will, by a deputation, wait upon the Commissioners, and explain more at large the views they entertain on the subject. I have the honour to remain your obedient Servant,

FREDERICK POLLOCK.

To this letter the following answer was sent, viz. :—

INTERNATIONAL EXHIBITION, 1862.

454, *West Strand, London, W.C., May* 29, 1861.

SIR,—I have submitted your letter of the 24th inst. to Her Majesty's Commissioners, and am desired to express their gratification at receiving from you an assurance of the readiness of the Council of the Photographic Society to co-operate with the Commissioners in carrying out the undertaking which has been entrusted to their management.

They will be glad to learn, at an early date, the names of the gentlemen whom your Council would recommend for appointment as a Committee in connexion with Class XIV.

Any suggestion which this Committee may make with respect to the position to be assigned to the various objects that they may consider entitled to admission to the Exhibition will receive the most careful consideration of Her Majesty's Commissioners, when they proceed to the ultimate distribution of space in the building, and to the arrangements connected therewith; but they feel that it would be premature, at this time, to discuss any of the questions connected with this part of their duties; and so many other matters are at present occupying their attention that they regret their inability to receive the proposed deputation from your Council.

I have the honour to be, Sir, your obedient Servant,

The Right Hon. Sir Fred. Pollock. F. R. SANDFORD, SECRETARY.

From the preceding it is not only pretty evident that the Commissioners, through their representative, decline to recognise photography as a fine Art, but endeavour to obtain the appointment of a Committee by the Council of the Photographic Society in order to compel that body, as it were, to condone the indignity. This proceeding would, in commercial circles, be designated by a rather ugly word, which it is needless for us to employ, as the *hiatus* will no doubt be readily supplied by our discriminating readers.

We are convinced that the Council of the Photographic Society will receive the warmest thanks of the photographers throughout the kingdom for the dignified position assumed by it in this matter; and, in order to strengthen the hands of those who are labouring for their benefit, we have to request the Secretaries of all those Societies the proceedings of which we have the honour to record officially to lay the question before their respective Societies at an early date, and to report whether it is the general feeling amongst the members that the course pursued by the Council of the Photographic Society is calculated to further the interest of our art, or otherwise.

In conclusion, we with the highest satisfaction place before our readers the following letter, addressed to the Secretary of the Photographic Society by a gentleman whose name ought to have no trifling weight in this matter with the Royal Commissioners, and no doubt would do so were there not some counter influence at work :—

TO THE SECRETARY OF THE PHOTOGRAPHIC SOCIETY.

University of Edinburgh, May 27th, 1861.

SIR,—At the request of one of the members of your Council I write to you on the position given to photography in the classification of the Exhibition of 1862. My apology for doing so is, that I was the responsible officer for framing the classification adopted in the Exhibition of 1851, upon which that of 1862 is founded; and further, that as a member of the Committee of Organisation the present classification has been brought under my notice by the Commissioners.

You have no doubt observed that the general principle of the classification is to group the raw materials employed in industry, then to group the machinery used to convert them into utilities, and, lastly, to group the utilities themselves as manufactured products.

The group Machinery cannot embrace photography with any propriety. If it has been placed there on account of the apparatus employed in its production, this in itself is a misunderstanding of the principles upon which the classification was framed. Cameras belong to the general class of "Philosophical Instruments," and have no more title to a separate class in machinery than telescopes, microscopes, electrical or surveying instruments, all of which are sections of one class.

But the mixing up of the photographic pictures with the instruments employed to produce them, when the art has developed in magnitude so as to entitle it to special exhibition, is a gross philosophical error. With equal ignorance the works of the sculptor and engraver might have been appended to cutlery and edge-tools, or the works of painters to the classes which include brushes made from hair, or to chemical products.

But besides this philosophical error, which will deface the classification in the eyes of foreign nations, who have attended more to its principles than we have in England, the proposed arrangement will be inconvenient for the purposes of instruction, and for the consideration of the jurors who have to judge the works exhibited. The visitor to the Exhibition cannot benefit by the abrupt transition from machinery, in its varied forms, to photographic pictures; and the jurors on machinery cannot be appropriate judges of the relative excellences of pictures.

In conclusion, I may express the hope that your efforts to obtain the alteration in the classification will be successful; and that while photographic apparatus is reduced to its proper rank as a sub-section of philosophical instruments, photographic pictures will be raised to the position which they have acquired by the recent progress in the art, by being put in the group of fine arts, which is the only place under which they can be consistently classified. LYON PLAYFAIR.

On the preceding further comment is needless, as it speaks volumes.

The following letter has been addressed to the Secretaries of the various Photographic Societies throughout the kingdom, by direction of the Council of the Photographic Society (London), and is accompanied by all the correspondence which we have already given :—

SIR,—I am directed by the Council of the Photographic Society of London to invite the attention of the body of which you are the representative to that portion of the regulations of the Commissioners for the International Exhibition of 1862 which relates to the photographic art.

In the programme published by the Commissioners, Photographic Apparatus and Photography are classed in Section 2, among machines and mechanical processes, instead of in Section 4, in which are placed Sculpture, Painting, Engraving, and all those occupations to which the title of "Fine Arts" is usually applied.

The Council have been requested by the Commissioners to name from among their body a Committee, whose office it will be to take care that the interests of photography and of its cultivators shall be properly represented in the Exhibition of 1862.

The Council, however, deemed it to be their first duty, before naming any Committee, to point out to the Commissioners the improper classification of the art, and to request that it should be removed from the class of machines and mechanical processes to that portion of the fine arts to which it has so just a claim.

Enclosed for your perusal is the letter of the President of the Society to the Commissioners, and the subsequent correspondence.

The final reply of the Commissioners appears to the Council to be so unsatisfactory as to compel the consideration, not only of the question of the appointment or non-appointment of a Committee, but also whether it will not be their duty to recommend those members of the Society who look upon their art as more than a mechanical process to abstain altogether from exhibiting any of their works.

Before adopting so grave a resolution, they desire to have the advice of the Society of which you are the representative. They have placed the correspondence before the Councils of the French, Belgian, and other Continental Photographic Societies, and requested their opinion upon the course which, in the interests of the art ought, under these circumstances, to be pursued.

It is their wish that any resolution which they may lay before the Commissioners in their final reply shall be the result of the united and deliberate opinion of the whole body of photographers, both in England and abroad.

Requesting you to lay this letter before your Society, and of favouring me with a reply at your *earliest* convenience, I am, Sir, your obedient Servant,

HUGH W. DIAMOND, M.D.,
SECRETARY TO THE PHOTOGRAPHIC SOCIETY OF LONDON.

MODIFIED COLLODIO-ALBUMEN PROCESS.

By H. PETSCHLER.

[Read at a Meeting of the Manchester Photographic Society, June 5, 1861.]

HAVING been requested by the chairman at our last meeting to read a paper this evening on the mode of manipulation by which the negatives of the pictures I then produced were prepared, I do so with pleasure, the more so as the details of this modification of the collodio-albumen process has never been properly put before the photographic public.

When my friend, Mr. Mann, in his paper last year, made known to you that when the free iodides, bromides, and chlorides of the alkalies in excess on the collodio-albuminised film were washed out with water the film would again be sensitive and fit for exposure in the camera, he did so merely bringing these chemical facts before you for what they were worth, not as a process; but the photographic public did us the honour of taking it up as such.

The negatives which I then showed to you were certainly pronounced to be very good, but they were not exactly what might have been desired. They were exceedingly sharp in detail, with plenty of half-tone; but there was a character about them which gave a peculiar hardness to them: perhaps the very sharpness lessened the softening effects which are so beautiful in the Taupenôt process. At the opening of this season, however, I had another trial, and I am happy to say that I have overcome this objection to a great extent, and that by a mode of slow development which I shall hereafter describe.

With regard to blisters, they can easily be avoided by proper management. The principal point to be observed, when coating the glass with collodion, is not to let the temperature of the plate be below that of the atmosphere in the operating room: when colder it is liable to condense moisture on its surface, especially where the plate may not be perfectly chemically clean. In taking the glass out of a cold box, for example, into the warmer atmosphere of the room, the plate is in this condition; and it should, in such cases, before being coated with collodion, be very slightly warmed all over, so as to raise it to the temperature, or a little above that, of the room. For this purpose I use a tin box, filled with lukewarm water.

The mode of manipulation which I follow gives, in my hands, invariably good results, and this certainty adds very materially to the pleasure of my photographic excursions. I generally bring home as many good negatives as I exposed for. They develop very clean; give very soft but vigorous negatives; and they keep bright even with a very long exposure, which I think is a great advantage. Double the exposure necessary makes but very little difference: it shows only in the development, and must be humoured accordingly. The plates keep a long time: they have been kept for months in an ordinary plate box without deterioration.

I will describe the mode of manipulation in detail, so that beginners may follow it up easily. I have, therefore, to crave the indulgence of the more experienced photographers for the benefit of the beginners, to whom, I have no doubt, every little hint will be welcome.

To begin, prepare the following solutions:—

NITRATE OF SILVER BATH.

Nitrate of silver crystals ..... 1 ounce.
Distilled water .....11 ounces.
Iodide of silver .....to saturation.
Acetic acid .....a few drops.

To saturate with iodide of silver: dissolve the one ounce of nitrate of silver first in three ounces of distilled water: add to this three or four grains of iodide of potassium. The whitish precipitate formed is iodide of silver. Stir it, and it will presently dissolve, or nearly so. Now add the remaining eight ounces of distilled water, to make up the eleven ounces, as in the above formula. This will cause a re-precipitation of part of the dissolved iodide of silver. Let this milky-looking liquid stand to settle for some hours, and then filter through clean blotting paper, and add the few drops of acetic acid, so that the bath is slightly acid. It is then fit for use. It should be frequently filtered during usage.

PREPARED ALBUMEN.

The white of ..... 6 eggs.
Distilled water..... 3 ounces.
Chloride of sodium (common clean kitchen salt will do) .....18 grains.
Liquor ammonia .....60 minims.

Dissolve first the salt in water, add the ammonia, and then mix with the albumen. Shake or beat it up into a thick froth. Let this stand a day or so, and filter the liquid formed through a sponge pressed loosely into the neck of a funnel. Keep it in a bottle corked up.

Instead of the three grains chloride of sodium to the ounce, as in the above formula, I sometimes use—

The white of..... 6 eggs.
Distilled water..... 3 ounces.
Chloride of sodium .....15 grains.
Bromide of potassium..... 3 grains.
Liquor ammonia .....60 minims.

The introduction of the bromide, I believe, makes the pictures softer, but the development is a little longer. With an iodide it takes a still longer time to develop.

To flow the albumen over the plate without getting air bubbles, use two beaker glasses or clean cups which will pour well; place a funnel with its spout broken off on one glass, so that it will reach nearly to the bottom, and press a sponge loosely into the funnel. When pouring the superfluous albumen back from the plate, always pour into the funnel, changing it from glass to glass, as the filtered fluid is being used.

Collodion.—I have succeeded best with a good positive collodion mixed with some old negative; but any good negative or positive collodion itself seems to answer well. An ordinary negative collodion diluted with ether works very well. Of course, whatever collodion is used should be of a known good quality. It does not require any peculiar kind; but if it is not good no process will succeed with it. I have not met with any yet which has not given me the desired density, with proper development. Always have plenty at hand when working. When many plates are prepared at a time dilute some collodion in a separate bottle with ether, and keep adding it to that in use as it gets too thick, taking care to shake it up before using it again.

PREPARATION OF THE PLATE.

Before commencing to operate have everything requisite prepared and placed in the places where most convenient to handle. Do this, if possible, an hour or two before beginning, in order that any dust caused by your preparation may first settle. Filter the silver bath, if required. Have plenty of *clean* blotting paper at hand, ready cut and folded, and a clean towel to wipe the hands with; but do not knock this about much whilst using, as the lint is apt to fly from it. Clean and polish your plates well. This should not be done in the operating room, or at any rate not there immediately before the preparation of the plates. See that no dust is flying about while coating the plate.

Warm the plate slightly to a little above the temperature of the room. Get firm hold of it by means of a clean pneumatic plate-holder; but let this holder not be colder or warmer than the plate, else a ring is formed in the film. Brush it over with a clean flat camel-hair brush to remove dust, and coat it with collodion. When well set—say in a few seconds, longer or shorter, according to existing temperature—detach the plate from the holder by getting hold of it firmly with your thumb and forefinger by one corner only; and, whenever the plate requires handling during the manipulation, always confine yourself to this one corner: never get hold of it by the sides. Stains are very liable if the plates, especially when wet, are handled too much. When the collodion is well set dip the plate into the nitrate of silver bath with one even continued motion. I use a wooden well bath for large plates, well varnished inside and out with shellac. Shake up the collodion in the bottle just used, so that it may be equally mixed again for the next plate: this will to a great extent prevent cloudy appearances in the film.

In a minute or so lift the plate in the bath up and down a few times to remove the apparent greasiness from the surface. Leave it in the bath four or five minutes, and give a few more up-and-down movements. Then remove into a dish filled with clean common water, but not into running water.

Coat another plate with collodion, and place into the silver bath as before.

Take the first plate out of the water, always getting hold of it by the same corner as at first; place it on the plate-holder, and pour water over it gently and evenly, until the apparent greasiness on the surface disappears, not longer. This washing should not be too much, as I have good reasons for believing that if too much of the nitrate of silver be removed it will cause uneven sensitiveness on the film. The amount of water used for this washing is immaterial: it may be used either direct from the tap or from a vessel, but it should be done gently and evenly. I have a flexible india-rubber tube, about half a yard long, fixed to my water tap. Holding the plate in one hand and the tube in the other I play on the surface of the plate gently two or three times all over, when the water will flow evenly down over the glass. Drain whilst in your hand for half a minute or so; in the meantime give the second plate in the silver bath a few up-and-down motions.

Now pour the albumen on the plate, sufficient to cover the surface, without spilling, in one continued wave from end to end, on and off twice. Do not let the wave stop until it gets to the opposite end to the one poured on, else the stoppage will cause a line in the negative. Drain in your hand for a few moments, until the bulk of the albumen is dropped off; then place on one corner, on clean doubled blotting paper, face side to the wall, and wipe the back with some blotting paper. Take care not to let the scratching against the wall cause any dust to fly: in the wet state the film soon catches it up and would cause spots in the negative.

Now take the second plate out of the silver bath and proceed as before, until as many plates as you desire to prepare at the time are finished.

When surface dry or nearly so, say in about an hour, bake the plates, by holding them either before a brisk red fire, or in an oven, or on a hot water bath. I use a tin box with two flat sides, the ends conical shaped, with a narrow base. At the bottom of each flat side is a ledge for the plates to rest on. At the top of one of the corners is a spout. This is nearly filled with water and placed over a Bunsen burner to heat. The water need not be quite boiling, but nearly so—say between two hundred degrees and boiling point. I keep them on this to bake for five or ten minutes.

The only thing necessary now is to wash them well in clean water, and they will be ready for the camera when dry.

After the baking the plates are comparatively insensitive to light, and may be kept in boxes for a very long time, until required for re-sensitising. A short exposure to a weak diffused light will not do them much harm. However, where it is not inconvenient, I should recommend them always to be kept in the dark; but, in case they be, by chance or by necessity, exposed to light, it is necessary to give a longer exposure in the camera than usual. In this case the negative will acquire its proper intensity before any injurious fogging may appear.

If the plates are wanted to be finished off at once after the baking, they are placed in a dish of common water, running, if possible, before they are quite cool, and left in there from five to ten minutes or longer, if convenient; then fixed on the plate-holder

and well washed under the tap; and finally (if at hand) flushed over once or twice with distilled water. Let them drain in your hand a few moments and place on one corner on clean doubled blotting paper, face side to the wall, to dry. After a few minutes change the wet blotting paper for some fresh, else it may cause foreign matter to be drawn up on to the film by capilliary attraction. When dry they are ready for exposure in the camera, but do not put them away until they are quite dry. In this state they will keep good and sensitive for months.

When the plates after the baking are kept before being sensitised in water, I should recommend them to be warmed again before the final washing. This will keep the film firmer on the glass.

The exposure in the camera required is about the same as some other dry processes—say about three to thirty minutes for stereoscopic pictures, six inches focus, quarter-inch stop; and about six minutes to one hour for eleven by nine inches pictures, half-inch stop, according to light and subject. This must be learned by experience. When convenient, I should recommend a long exposure, as the pictures in this case are less dangerous to develop.

DEVELOPMENT.

Prepare the following solutions:—

Pyrogallic acid	3 grains.	filter if not clear.
Citric acid	1 grain.	
Distilled water	1 ounce.	

Nitrate of silver	10 grains.	filter if not clear.
Distilled water	1 ounce.	

Fresh nitrate of silver must be used for this solution, not old silver baths. Also—

Protosulphate of iron	8 grains.
Acetate of soda	4 „
Acetic acid	20 minims.
Distilled water	1 ounce.

This last-named developer was recommended to me by a friend for wet plates. I find it answers well for the dry process.

The development is of great consequence, and, in order to get soft and vigorous negatives, it should be begun with very little silver, not increasing that until all the details are well out.

The following mode I find the best:—Hold the plate by means of a plate-holder firmly in the hand, moisten the surface all over quickly and well under the tap or in a dish, and flush it over with distilled water. Take of the strong three-grain pyrogallic developer, as per formula, sufficient to cover the plate well, and pour it on and off several times; then add to the ounce of developer in the cup three to four drops of the ten-grain nitrate of silver solution, and continue pouring it on and off the plate, thus keeping it constantly in motion. After some minutes the picture will appear: first the sky and high lights in the body of the picture, gradually followed up by the less and still less illuminated parts. Continue developing with the same solution until all the details are perfectly out; then take some fresh pyrogallic solution, and dilute it to about half its strength with distilled water, and add about half a drachm of the ten-grain nitrate of silver solution; with this continue developing until the required density is attained. If this should not bring out the intensity, dilute some fresh pyrogallic solution still further, say to about quarter its strength, and add a drachm or two of the ten-grain silver solution: this has never failed in my hands in bringing out the desired intensity. Should the picture give signs of decided fogging before the proper density is acquired, or should it make its appearance with great vigour, quicker than usual—in fact when the plate gives unmistakeable signs of much over-exposure—then dilute the developer at once considerably, and add plenty of silver: this will soon darken the high lights, whilst the shadows will follow but slowly. Experience only will teach the operator how to humour the negative. Any reasonable exposure too little or too much may thus result in a good picture by slow or rapid development; but I would caution you against a too rapid development, as the resulting picture is liable to be hard. The best way to know when the silver in the developer should be increased is when, looking at the surface by reflected light, the strongest shadows in the negative appear to begin to fog. The pyrogallic should then be weakened and the silver increased, not before.

Another mode of development which I have been very successful with, and which promises to be very useful, especially when pictures have been under-exposed, is, to begin with the protosulphate of iron and acetate of soda developer, as per formula above, commencing with little silver, and increasing it according to exposure. When the details are all out, and the negative gives signs of fogging before the desired density is obtained, then change the developer. Take of the pyrogallic solution, diluted to about one grain to the ounce, and add half a drachm or more of the nitrate of silver solution. This will soon darken it. With this iron and acetate of soda developer very soft pictures may be obtained, and a shorter exposure is necessary. Mixed with the silver it soon gets muddy, and should be changed when it gets too dirty.

By a subdued yellow light the appearance of a good negative, before fixing in the hyposulphite of soda, should be almost black or dark brown in the high lights and fogged in the shadows. When the hyposulphite has afterwards dissolved out the iodide of silver it will appear lighter and more transparent. A good negative should not have any perfectly transparent places like the glass itself. A slight fogging in the shadows, with detail and gradation of tone up to dark brown in the high lights, make rather slow printing negatives; but the best pictures are obtained from them.

When the development is carried far enough wash the plate in common water, and place it in a solution of hyposulphate of soda: say—

Hyposulphate of soda ..... 3 ounces,
Common water ..... 20 ounces,

until the yellowish green iodide of silver in the plate is all dissolved out. Then wash well for a minute or two under the tap, so that no hypo. may remain in, and dry either spontaneously or by gentle heat. If the film should wrinkle after the fixing and washing, dry spontaneously: it will then adjust itself.

When dry, examine it by daylight, and see whether all the iodide of silver is out of the film, and whether the negative is dense enough. If all right, then varnish it.

If the iodide be not all out, it may be replaced in the hypo. If it be not dense enough, and the hypo. having been previously well washed out, it may then be strengthened by a very weak solution of pyrogallic developer and a ten-grain solution of silver, mixed half and half. This must be done very quickly and with great care, as the negative is sometimes liable to darken very soon, and too much.

Lastly, I will enumerate the most important points necessary for success in the process.

1. Let the glass be of the same temperature or above that of the atmosphere of the room when coating it with collodion. This will, to a great extent, prevent blisters.
2. After taking the plate out of the silver bath do not wash too much, but merely until the water flows evenly over the glass. This will ensure even sensitiveness of the film.
3. Wash well after the baking, so that all the excess of chloride of sodium in the film be dissolved out. The more they are washed the more sensitive they are likely to be.
4. Give plenty of exposure in the camera.
5. Develop slowly, commencing with a strong pyrogallic solution and little silver, gradually weakening the pyrogallic and increasing the silver.

NEW DEVELOPERS FOR THE NEGATIVE PROCESS.

By M. D. Van Monkhoven.

Believing, with the Abbé Desprats, that processes of the greatest rapidity are to be obtained more by modifications of the sensitising bath and in the employment of new reducing agents than in seeking after novel formulæ for collodions, I address myself to the subject of developers.

The first developer I have experimented with is the sulphate of uranium—properly speaking the proto-sulphate of uranium.

The simplest method of procuring this substance in a perfect state of purity is by dissolving a few grains of the proto-chloride of uranium in ten times or less of their weight in water. On mixing this solution with an equal quantity of a solution of caustic soda a blackish green substance is precipitated, which is the hydrous protoxide of uranium. On allowing the liquid to stand at rest for some hours the precipitate settles: then decant the supernatant liquid, add fresh water, and again decant. Repeat this operation until the washings do not contain a trace of the chloride: this is ascertained by adding a drop of solution of nitrate of silver to a portion of the liquid, and if a cloudy precipitate is not produced the washings are free from chlorides.

Then add sulphuric acid, drop by drop, to the precipitate, and stir the mixture with a glass rod.

The precipitate is dissolved and affords a green liquid. When all the precipitate is dissolved cease adding more acid. The resulting liquid is ready for use and should be preserved in a stoppered bottle, as air tends to decompose the proto-sulphate very readily into persulphate of uranium, which is incapable of developing the image.

The preparation of proto-chloride of uranium is very simple. Calcine nitrate of uranium in a small porcelain crucible furnished with a cover at the melting point of tin. In an hour the nitrate of uranium is decomposed into a reddish yellow mass, which is to be finely pulverised and intimately mixed with double its weight of wood charcoal in a state of impalpable powder. This is made into a paste with oil, and formed into pellets, which are calcined again in a closed crucible. These pellets are placed in a tube of hard German glass and heated to a dull red heat, and a stream of dried chlorine vapour is then passed through the tube. The manipulation is exactly the same as that of the proto-chloride of iron, chloride of silicon, &c.

The chloride of uranium is found in the cold part of the tube in little masses of a very decided green colour. This should be weighed, dissolved, and treated with caustic soda, or potash, as above described, as this chloride is very easily decomposable by the oxygen of the atmosphere.

We have also prepared this solution as recommended by Nièpce; but I do not think that M. Nièpce has observed the laws of development of this liquid on a film of collodion. He places in a closed glass bottle 100 parts of water, two parts of nitrate of uranium, and a bar of zinc. On exposing the closed bottle to the sun the yellow tint is changed into green, for the nitrate of uranium passes into the state of a proto salt. A few drops of sulphuric acid produce a solution having the most energetic reducing power, only this liquid is not readily preserved.

M. Ebelmenn recommends a very convenient method. It consists of mixing together—

Water	100 parts
Absolute alcohol	20 „
Nitrate of uranium	5 „
Sulphuric acid	2 „

and exposing the flask containing the mixture to the sun's rays. The alcohol is transformed in part into aldehyde, and the nitrate of uranium into proto-sulphate.

But these two methods do not give me such satisfactory results as by the process first described.

To develop pictures taken on collodion, the exposure should be about the same as if it were intended to develop with sulphate of iron. The image then develops slowly, especially if a certain proportion of acetic acid be added to the developing liquid. If the sulphate of uranium do not contain a great excess of sulphuric acid, and if it do not include two parts of glacial acetic acid to one part of chloride of uranium, the image is developed as quickly as with pyrogallic acid, and yields pictures of extraordinary vigour. But it is a singular peculiarity that, at the first moment when the developing liquid is poured upon the plate in the dark room, the picture appears very slowly; but in an instant it becomes defined, and attains vigour very rapidly. When the picture is judged sufficiently developed, the action is arrested by plunging the plate into water.

I believe this new developer, from its energy, to be an advantageous addition to photography.—*Le Moniteur.*

ON THE CONSTRUCTION AND APPLICATIONS OF THE MAGIC LANTERN.

By J. T. Taylor.

[Read at a Meeting of the Edinburgh Photographic Society, June 5th, 1861.]

Among the many optical instruments which minister to the instruction or amusement of mankind the magic lantern is worthy of a tolerably high position. It may be defined as a dioptric arrangement for throwing on a white screen, or other obstructing medium, an enlarged representation of a strongly illuminated transparent picture, differing from the solar microscope only in the source of illumination and the size of the object to be magnified. The distinction of the illuminating media is, however, fast being annihilated; for to such a state of perfection has artificial light attained, that even for the solar microscope the sun has been supplanted by the oxyhydrogen and electric lights.

The magic lantern, like most other subjects, has a history; but it is involved in considerable obscurity. We have evidence which, although purely inferential, is still entitled to great respect, that this instrument must have existed at least 300 years ago. About the middle of the sixteenth century lived a Sicilian priest, a man of considerable literary and scientific attainments. He was also reputed for his skill in magic and necromancy. The celebrated Benvenuto Cellini gives a somewhat particular account of an interview held between this priest and several of the denizens of some other world, Cellini himself and one or two others being present. It would seem that, after the usual ceremonies and incantations, performed by the feeble light of a fire in which one of the assistants from time to time threw various perfumes, innumerable troops of devils appeared. On a second occasion similar results followed; perfumes in abundance were burnt, and, as a consequence, demons in abundance were in attendance. Cellini, who narrates these incidents, says:—"When the magician had performed the rest of his ceremonies he stripped off his gown and took up a wallet full of books which he had brought with him. We all went out of the circle together, keeping as close to each other as we could, especially the boy, who had placed himself in the middle, holding the necromancer by the coat and me by the cloak. As we were going to our houses in the quarter of Banchi, the boy told us that two of the demons whom he had seen at the amphitheatre went on before us leaping and skipping, sometimes running upon the roofs of the houses and sometimes upon the ground."

Now, in this description one or two things are worthy of notice. In the first place, volumes of smoke, caused by throwing various substances into the fire, were produced; second, the magician had with him what seemed to be a wallet full of books; and third, some of the demons or figures which had been seen in the amphitheatre were also seen dancing on the walls of the houses as they passed along on their way home—the priest being still in the company, and having in his possession the said wallet of books, or what was mistaken for it. Now, in the present day, every schoolboy knows that some of the most startling and curious effects may be produced by throwing a magic lantern phantom on a wreath of smoke instead of a white screen, more especially when a little art is employed to keep entirely hidden the fire from which the smoke arises. This fact, coupled with the other that the priest or magician carried home with him a box, and that some of the same phantoms which had been seen in the place specially prepared for the exhibition were also seen, now on one side and then on the other of the narrow streets through which they passed on their way home after midnight, establishes satisfactorily that all these various troops of demons, which must have so astonished the people in those days and enhanced the reputation of the sacerdotal magician, were the offspring of a well constructed magic lantern. These things took place, however, one hundred years before Kircher, the reputed inventor of the magic lantern, was born.

I may here say that, although the state of knowledge in optics and artificial illumination in the times of James IV. of Scotland was such as at once warrants us in rejecting as erroneous the story of the aërial herald and pursuivants who appeared over the ancient cross of Edinburgh immediately before the battle of Flodden (for particulars see Sir Walter Scott's *Marmion*), yet at the present day such a feat would be not only possible but comparatively easy. With a jet of smoke or vapour projected into the air an excellent representation of objects could be depicted by means of a lantern placed fifty, one hundred, or even a greater number of feet distant from it. A slight diminution in the magnifying power of the object glass of the lantern, so as to send off the rays at a more acute angle than is usually employed, coupled with a light of considerable intensity, would fulfil every condition.

After its recognised invention by Kircher it would seem to have progressed in a somewhat steady and deliberate manner up to the present time. Within the last few years its manufacture has received an impetus owing to the acknowledged superiority of photographic transparencies over those produced by the hand; and it is from a conviction that the lantern and the camera should, to a greater extent than hitherto, go hand in hand that the subject has been brought before a photographic society.

With these prefatory observations the subject now resolves itself into the following:—firstly, the lantern itself; secondly, the slides or pictures; and thirdly, a few of its applications.

The first part comprises the lighting, the condenser, and the object-glass. The body of the lantern may be made either of common tinned sheet or wood. The best class is usually made of mahogany. The requirements for the body are that it shall be rigid—shall not be affected by the heat arising from the source of light—and shall completely prevent any leakage of light from the inside. The chimney must be constructed so as to give perfect passage to the heated air while it debars the passage of light. The chimney should be put together by means of rivetting in preference to soldering; for, unless the oxyhydrogen or electric lights are employed for lighting it, the heat generated is so great as to melt the solder commonly employed in its construction. This, as I have said, is not the case when the oxyhydrogen light is used; and to some it may appear singular, for up to the present time the oxyhydrogen blowpipe possesses an intensity of heat which is not attained by the hottest furnace. But more of this again.

The following comprise the usual modes by which the lantern is lighted:—candle, lamp, common gas, and oxyhydrogen gas. To

this category might also be added the electric light; but it is employed very seldom, and is of so cumbrous and expensive a nature that it will never be much employed for this purpose. Candle is only employed in the most inferior instruments: the light emitted from this source being of such a weak and puny character as to prove utterly inadequate towards the proper illumination of a magnified picture. Of lamps, although in the toy and cheap lanterns a very primitive form is used, in all instruments of greater pretension the beautiful invention of Ami Argand, resulting in the lamp named after him—the Argand lamp—is employed. The peculiarities of his invention are that the burner is formed of two tubes of metal one inside the other; in the space between, which is closed at the bottom, is a cylindrical wick and a supply of oil. Through the inner cylinder, as well as outside the outer one, a current of air passes upwards, and insures more perfect combustion of the oil than could have been obtained by any other arrangement. In order to provide for the more thorough combustion of the carbon in the oil, an artificial draught was excited by the addition of a glass chimney which, while it very much increased the brilliancy of the flame, also imparted to it great steadiness.

In places where no gas works exist this burner has been largely employed in the shape of *moderator* and other lamps. This light seems now in danger of being quite extinguished by the parrafine lamp, from some alleged advantages possessed by the latter; but I am not yet aware with what advantage it may have been applied to the magic lantern.

When common gas is used, undoubtedly the best form of burner is the Argand, with a glass chimney. For a small room, either this or the Argand oil burner answers perfectly well, and when, in addition, a parabolic reflector is used, the light is really of a very respectable character; but for a large hall like the present, a church, or other similar building, it is inadequate towards giving an enlarged view of a small picture with any degree of force. For this purpose we must employ a light attached to which are such names as "the Drummond light," "the oxyhydrogen light," and "the lime light." This last extremely beautiful, pure, and intense light is produced by allowing a jet of the mixed gases to impinge on a piece of lime, which, being rendered incandescent, emits a strong light. All the requisites for the production of this light are oxygen and hydrogen gases and a cylinder or ball of lime. Oxygen is made by introducing chlorate of potash, mixed with ten per cent. of black oxide of manganese into a retort. This, when heated in an ordinary fire, liberates oxygen in abundance. By means of a proper conducting pipe and purifier it is passed into a bag made of macintosh cloth or vulcanised India rubber. While it is undoubted that the oxygen is formed from the chlorate of potash alone, and also that the oxide of manganese very greatly facilitates the liberation of the gas, it is difficult, if not impossible, to say *how* the oxide of manganese effects this. The generally accepted theory is that it acts by catalysis, or by its presence, for it enters into no chemical combination with the potash, and parts with none of its oxygen, unless, indeed, at a much higher temperature than is required for the operation in question at present. Hydrogen gas is formed by the addition of diluted sulphuric acid to broken pieces of zinc. The gas is at once liberated, and may be put into a bag ready for use.

When these two gases are mixed together they form a compound gas of an exceedingly explosive nature. Formerly the gases were combined in a separate cell or chamber, and conveyed thence to the burner. This, as might have been anticipated, was sometimes attended by explosions of such violence as to sacrifice life. But at the present day this is obviated by the simple expedient of not allowing the gases to mix until they arrive (by separate pipes) at the nozzle of the burner. Here, when ignited, they give little light, but a most intense heat: so great is this that the most obdurate metals—iron, copper, platina, and others—when subject to its influence, melt almost instantly. When a piece of lime is made to receive the flame, the light under consideration is emitted. At the close of the exhibition of pictures to-night you will have an opportunity of verifying all I have advanced in favour of the superior illuminating qualities of the oxyhydrogen over every other form of light.

A modification of this is sometimes made by the omission of the hydrogen and the substitution for it of a spirit lamp, through the flame of which the jet of oxygen passes before falling on the lime-ball. This modification usually receives the name of the oxycalcium light. In character it is the same as the original oxyhydrogen light, but inferior in degree. A more convenient modification consists in the substitution of carburetted hydrogen, *i.e.* the common gas of the streets, for pure hydrogen. This is the process we have employed on the present occasion.

A few words must suffice to dismiss the optical portion of the lantern. It consists of a pair of condensing lenses placed between the picture and the light, so as to ensure equality of illumination all over the picture, and an object-glass—something akin to a camera lens—a few inches outside of the picture.

The next part of the subject is of more interest to the photographer. It is how to make the slides. I will endeavour to answer this by detailing the way by which I made *some* of the slides which in a few minutes will be submitted to your notice. I assume that the operator is in possession of the negative photographs from which his subjects are to be reproduced, and also that he has at least a rudimentary knowledge of the collodion process. The glass should be carefully examined and the best only selected. After being cleaned it must be coated with collodion. Now, it is of considerable consequence that the collodion be porous—capable of receiving a dense deposit of silver—that it stand a long development without fogging—and, above all, that on the lights of the picture there is not the least vestige of a deposit of silver, but that it be represented by clear transparent glass. It would be out of place here to say how I make collodion which shall fulfil all these conditions: this will better be done at one of the ordinary meetings of the society. The bath I use is the ordinary one, acidulated with acetic acid. After remaining the usual time the plate is removed and subjected to a thorough washing. This done, it is coated with a preservative varnish. This, according to the principles enunciated by Dr. Hill Norris, of Birmingham, and carried out in a process for which he obtained a patent in 1856, consists of substances of a gummy nature dissolved in water, which, filling up the pores of the collodion, prevents it drying into the close horny film it otherwise would, and allows, at a subsequent part of the operation, the developing solution to permeate the entire thickness of the film. In 1856 Dr. Norris published an account of some of the various substances suitable for making this preserving varnish.* He says:—"I have not confined myself to gelatine, but have used albumen, gum, dextrine, starch, caseine, gluten, mucilage, sugar, tanno-gelatine, and a great variety of substances, some of which I see are now being set forth by others who have imbibed my views." Such is the historical ignorance or moral obliquity of vision of some photographers at the present day that some of them have, with the greatest coolness, appropriated the valuable researches of Dr. Norris, and, selecting one from the well plenished larder of that gentleman, have trumpeted it forth to the world as some new thing. If any member of this society wishes to be dubbed an *inventor* in photography, all that is required is to select the appropriate substance or something analogous, and, prefixing his name, call it the Brown, Jones, or Robinson process. Seriously speaking, it is rather melancholy to think how often and with what success this sort of "invention made easy" is practised. But to the subject. The plate being coated with a preservative varnish is dried preferably by a tolerably strong heat—such as that from a dull fire, a heated brick, or a hot-water bottle. When dry, it is either ready for immediate use or may be kept for months or years, excluded, of course, from the light. The negative being placed over the plate thus prepared the whole is exposed to an ordinary gas-light from fifteen to sixty seconds, according to the density of the negative and the character of the picture that is desired. The development of the picture next follows. This is the great point in photography, and in this I shall be borne out by all who have had experience. The members present who, on a late occasion, heard Mr. Burns read his excellent and practical paper *On the Fothergill Process*, will recollect his dictum that more pictures were spoiled from improper development than from any other cause whatever. Now, any expression of this kind coming from Mr. Burns is entitled to consideration; for to him has been generally awarded (and this award I from my very heart endorse) the high position of being among the first, if not the very first, dry-plate operator at least in Scotland. There is no doubt that protosulphate of iron will *not* produce such a good picture as pyrogallic acid. True, on one occasion I did recommend it pretty strongly; and on my authority Mr. Macnair recommended it as the best developer for that modification of Dr. Norris's discovery which he brought under the notice of the Photographic Society of Scotland, in which the varnish consisted of wort or malt infusion in preference to any other of this class. Since that time, however, I have discarded it for all kinds of dry plates, in favour of pyrogallic acid and *another substance* sometimes employed by me—of which

* In the *Journal of the Photographic Society*, which serial is also the organ of the Photographic Society of Scotland.

further particulars will be forthcoming—these latter giving a much finer quality of picture, and being much more manageable. The degree of development must be determined by the taste of the operator and a consideration of the kind of light to be employed in the lantern; for it is evident that a picture to be exhibited by the comparatively feeble light of an oil lamp must have its details rendered in much greater transparency than when the oxyhydrogen is intended to be used.

When developed, fixed, and varnished, the picture, if successful, will have its highest lights of the clean glass. If preferred, it is now coloured. While some use water colours with very great success, it is generally thought that colours in oil are usually more advantageous. From the perfect transparency required in the colours, but few are available: yellow lake, gallstone, madder lake, Prussian blue, burnt sienna, and madder brown, rank chief among those used. Without further remark I dismiss this part of the subject, and this the more readily that I hope to get my able coadjutor, Mr. Ramage—whose skill in this department is of a very high order—to favour us with an evening on this subject at an early meeting of the Society.

We have now arrived at the application or various uses to which the lantern may be applied. Only a few of these can here be glanced at. Perhaps the use with which all our earliest ideas are associated is that of the amusement of children. For this purpose the lantern stands altogether unrivalled. At a party of children, the intense delight depicted on the little eager faces when it is introduced leaves no doubt as to its popularity with them.

A few of the class of pictures—usually of a somewhat comic character—best adapted for the amusement of children will now be exhibited. * * * * * * *

But, with respect to children, a higher and more important application of this instrument is, to assist their tuition in the rudiments of geography, natural history, geology, and astronomy. Before giving illustrations of some of these, a few very rudely-painted slides, illustrative of one of Æsop's fables—"The Old Man and his Ass"—will be shown. A judicious exhibitor will, of course, when showing such a picture to children, accompany it with a narration of the fable—which, in the present case, I assume, you all know already. * * * * * * * *

Not to encroach too much on your time, we shall submit one or two out of a great variety of astronomical slides. The first one represents the solar system, in which, by a complicated system of wheel work, each planet revolves round the sun—no two performing their revolutions in the same time. The next is a telescopic view of the moon. I may state that this is not a mere fancy picture, but a real map, executed from the photograph exhibited before the British Association at Liverpool.

As a number of pictures of a general nature are now to be submitted for your inspection as dissolving views, allow me to explain how the dissolving effect is produced:—Two lanterns, placed side by side, must be employed, and the discs of light on the screen must exactly coincide. A pair of fans are made to move in front of the lanterns, in such a way as to allow free passage of light from the one, while that from the other is entirely stopped. While the picture on the screen is being examined another picture is inserted in the darkened lantern, and on gently sliding the fans the one picture is gradually covered from the light, while the other as gradually is brought to view. The effect of the pictures merging into one another is very beautiful.

And now a few words about the pictures. Some have been photographed from nature, and a considerable number of them from engravings. Many of them are parts of sets for the illustration of lectures—such as the Polar regions, the life and career of Napoleon, and others. Some of you may not be aware that there is a firm, in Edinburgh, who get up such lectures periodically for the benefit of their numerous *employés* and their friends. I allude to Messrs. Nelson, the eminent publishers, of Hope Park, who provide these intellectual and pictorial feasts, interlarded with music of a high class; and which, judging from appearances—for I have had the pleasure of being present on two occasions—seem to be, indeed, highly appreciated by those for whose benefit they are given. This, indeed, is an ennobling use of the magic lantern; and let all honour be awarded to the Messrs. Nelson for taking the initiative in a movement which very much tends to strengthen the ties which bind employers and employed. Others may be acting in a similar manner: I sincerely hope they may—only I am not aware of it. I may say, further, that our Society being, from its extreme youth (not yet three months old), unable to afford a suitable lantern for itself, is indebted for the use of the lantern before you to the Hope Park printing establishment.

THE NEGATIVE ALBUMEN PROCESS ON GLASS.

By John Cramb.

(*Continued from page* 204.)

EXPOSURE.

The length of time required to expose for good results in any process is a matter on which no very definite rules can be given. Albumen is generally considered slow. It is very difficult to compare processes under this head, as so few persons are equally competent to try several, and so much depends on development and the previous preparation of the plates for the trial by each process. Perhaps, after all, different operators, equally skilled in different processes, and trying the same subject at the same time with similar lenses, would be the only fair trial. It would be no easy matter to get such a comparison made. Personally I believe albumen to be the quickest dry process. I have not turned my attention much to rapidity of exposure, and not at all to instantaneous exposures. I believe albumen capable of yielding instantaneous pictures with no important difference in the plan of working I generally adopt. The instantaneous pictures of my friend, Mr. Kibble, are on collodio-albumen—a process I esteem as generally slower than plain albumen. I have taken two pictures in one day: the one was exposed for twenty seconds, the other for twenty-four hours, getting all the light that was going in a day in the middle of October. The twenty-seconds' picture was over-exposed; the twenty-four hour one—a view of the interior of Westminster Abbey—was under-exposed. In both the preparation of the plates was the same. The darkest subject, photographically, I ever tried was the interior of the House of Lords. I got a picture by an exposure of six hours, with the full aperture of a double combination lens. I exposed some for three days on the same subject, and, though sharper, from using a landscape lens with a small stop, yet I prefer the double lens picture as being more perfect.

While in Syria I scarcely ever tried rapid working, and *never prepared* for it. My object there was to get fair pictures with certainty and with as little trouble as possible.

DEVELOPMENT.

The development of a dry plate is an important part of the manipulation. Almost any amount of exposure can be made to yield good pictures in albumen by adapting the development to the exposure: at least as much as a difference of twelve or fifteen times can be made to yield similarly finished pictures.

Any of the usual developing agents employed in other photographic processes will answer in albumen. I almost invariably use gallic acid, which I prefer to be warm, adding a little aceto-nitrate of silver. I develop in a porcelain dish, and generally have several going on at the same time. My usual mode of procedure is something like the following:—Get a kettle of warm water, put a little gallic acid in the dish, and pour the hot water over it. My finger tells me when it is about the temperature I want. I then add the silver, mix well, then drop in the plate. If properly exposed, the picture appears in about half a minute. I attend to one picture till I see how it is going on. If it can be left I proceed to another dish, and so to a third—seldom more, except they are much under-exposed, and even in that case I cannot have a large number profitably going on, as I prefer using a fresh hot developer if under-exposed. With stereos I generally put six plates in one dish, and with three dishes that makes eighteen pictures to look after. With eight by ten, the size I frequently work, I could not risk so many. A picture which appears in less than half a minute will generally be fully developed in half-an-hour. I have had fine pictures fully developed in a few minutes, and I would always prefer to err on that side. Some of the finest pictures I have ever done were about an hour in developing. I do not at this time remember having got any very fine results by long development; but yet it is a great matter if by such means one can get a picture in a case in which, without long development, there would be none. The aceto-nitrate of silver to be used in developing should contain a larger *proportion* of *acid* than the sensitising bath; and it is more convenient to have it weaker—say ten or fifteen grains to the ounce.

FIXING.

The fixing is done with a solution of hyposulphite of soda, or the proportion of one of hyposulphite of soda to six of water. I prefer it generally much weaker, and not alkaline.

I had purposed saying something on the history of this process and the chemistry of it; but, on looking over my notes, I saw there would be little of practical value to the beginner, and my time is far gone, and so I fear is your patience.

I would yet wish to say a few words on some of the special difficulties and objections to albumen. Small holes in the film are

a frequent annoyance, and arise from several causes. Imperfect beating up of the albumen produces the innumerable number of minute holes equally distributed over the whole plate. Somewhat similar effects are produced by using impure or *alkaline* iodide of potassium. The use of *free iodine* prevents this.

Dust falling on the plates in any of the various stages of the manipulation will produce holes, but quite different in character, and only here and there, over the picture. Bubbles is another of the vexations. Abundant beating assists in preventing that, and having the plate in proper season when it is silvered,—not too dry. This is not a serious trouble at all, and can be readily *cured* by avoiding the use of *alkaline* hypo. or washing waters.

Most of the objections generally urged against pure albumen have been referred to, and in some measure met already, viz.:—the length of time required in preparation of the plates, both albumenising and silvering and washing; the long developing and long exposure; and uniformly giving harsh pictures. All these charges we meet with a flat *non sequitur*. Try the process. I will not promise too much; but have confidence that a fair proportion of those who try will persevere and be satisfied.

It is fitting that I should say something of the advantages or superiority of albumen. I believe that is not much required—they lie so much on the surface, and will strike every one at once; so that if I can remove objections and convince my auditors that they could easily succeed in it, if they would only try, my work is perhaps done. When albumen on glass was introduced to the photographic world there were no competitors, it may be said—there was no negative process but on paper. It must be confessed that there is something to explain—why, if it be so simple, so easy, and so superior, it has been so little used, as we must allow. For how few exhibitors have we ever had at any British photographic exhibition whose pictures professed to be by this process! And how much fewer—almost none—were resident among us! It came to us from France, and seems never to have been properly naturalised. Some years ago I would have had more hope of success in recommending it, when there was no dry process on glass. In some respects the time may be esteemed favourable. The attention of photographers is now more than ever turned to the desirableness of a good workable dry process; and, above all, it is now fully acknowledged that dry plates can, if skilfully used, give good pictures—as fine as wet, some high authorities say. My own opinion is so modified that I could not either say yes or no to that proposition. Under every favourable condition I would be disposed in favour of wet plates; but, taking the average of the positions in which an operator will be placed, I would incline to the opinion that the resulting picture, with equal skill and experience, would very often be in favour of dry plates.

Comparing albumen with dry processes in which collodion is used, I think the superiority is much on the side of albumen for ease and simplicity of working. It has an important advantage in the certainty of obtaining the raw material in any country, and also, in its extreme cheapness—a consideration where large plates are used.

For transparencies no other process can be compared with it. I have not used it in large quantity for this purpose; but, to the extent that I have, I found it quite as easy as taking negatives. Mr. Negretti, of London, has been calling the attention of amateurs to the superior suitability of albumen negatives for printing transparencies from, because they will bear being pressed into close contact without being injured, while those by other processes will not. I have found no necessity for this absolute closeness of contact; but I prefer to leave a full description of the apparatus I use for this purpose to a future occasion, when I can also show specimens and perhaps operate in your presence.

I conclude with an earnest recommendation to those who hear me to try this process. Begin with one egg. Nothing peculiar is required. But determine, before you begin, that one failure will not discourage you. If I can assist in helping any one personally over a difficulty, my services are at the command of those who will try the albumen process; and nothing will give me greater pleasure than to smooth the path for fellow-labourers in the cultivation of our art in this department.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

No. IV.

PROF. WM. THOMSON'S REGISTERING ELECTROMETER.

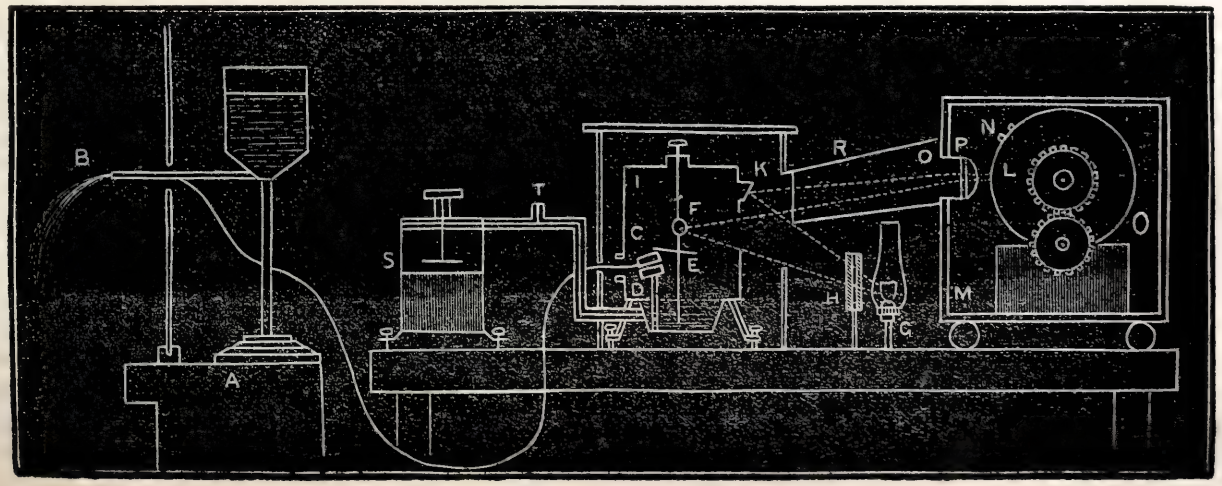
Professor William Thomson, of Glasgow, has recently invented an electrometer for registering, by photographic agency, the diurnal variations in the electrical condition of the atmosphere. This places another instrument in the hands of the meteorologist for foretelling the advent of fine or stormy weather. The apparatus has lately been set up at the Kew Observatory; and, as we have had an opportunity of examining it since it has been in action, we purpose devoting the present article to its description, as it furnishes a very good type of the arrangements usually adopted for registering, by photographic appliances, the action of meteorological instruments, wherein an uninterrupted series of observations, from hour to hour, day to day, and year to year, is of the greatest importance, and where, otherwise, human observation would have to be employed.

The Collector consists of a copper reservoir, A, *fig.* 1, capable of holding about ten gallons of water, fixed on an insulated stand. From this projects a metal tube, B, that passes through an insulated aperture in the wall of the Observatory, and terminates at some feet from the building in a jet, from which a fine stream of water is allowed to flow: a copper wire passes from this collector to an insulated plate, C, in a reflecting electrometer. Professor Thomson finds the water-jet to be a more energetic and convenient collector* of electricity than the flame of a spirit or other lamp, or the fine metal points hitherto used for similar purposes.

The conducting wire is, as we have said, attached to an insulated metal plate, C, fixed within the glass jar of the electrometer: this plate is a semi-circular ring (as shown in *fig.* 2), and is separated by about one-tenth of an inch from a similar metal plate, D, but which is in communication with the metal-work of the instrument, and so with the earth. A little above these two plates, a delicate counterpoised aluminium needle, E, is suspended by a fine glass fibre from the top of the electrometer. A fine platinum wire is also attached to the aluminium needle, and hanging in a line with the glass fibre it dips downwards into some sulphuric acid placed in the bottom of the glass portion of the instrument. The interior of the instrument is thus similar in arrangement to that of a Leyden jar. The object of this arrangement is, that when electricity is communicated to the insulated plate, C, the aluminium needle, E,

* *See* "Electricity, *Atmospheric*," *Nichol's Cyclopædia of Natural Philosophy, 2nd Edition.*

FIG. 1.

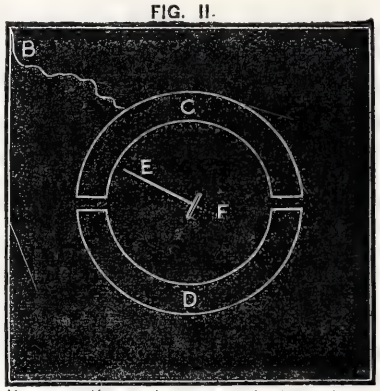


shall, by virtue of a fixed charge of positive electricity previously communicated to it, be attracted or repelled, according to the nature of the electricity (+ positive or — negative) collected by B, and that it shall be deflected to a greater or less extent, according to the amount of the charge imparted to C.

Behind the aluminium needle, and attached to the wire by which it is suspended, is a very small and light mirror, F, consequently, when the needle is effected by an electrical charge, this mirror will be also deflected from side to side.

As only *a portion* of the semi-circular plates, C and D, can be shown in section in *fig.* 1, the absolute arrangement of the electrometer plates, needle, torsion fibre, and mirror, will be better understood by reference to *fig.* 2, which is a horizontal section as seen when looking down from above the electrometer.

FIG. II.



C is the semi-circular ring connected by the wire with "the collector," B; D the other half ring in connexion with the earth; E the aluminium needle of the electrometer; and F the little mirror that receives and reflects light from the lamp, G (*fig.* 1). The electrometer is enclosed in a square mahogany case, which is indicated in *fig.* 1.

We now come to the photographic arrangements for registering any deflections of the electrometer needle.

The light from *the edge* of a very flat gas flame (unnaphthalised), issuing from a burner, G, of peculiar construction (similar in shape to that employed for the consumption of paraffine), passes through a slit, H, in a metal screen, so as to cast a beam of light on the mirror, F, and also on *a fixed* mirror attached to the outside of the electrometer at K. Before the electrometer is connected with the collector, B, the mirrors, F and K, are so adjusted that the rays incident on their surfaces shall both be made to fall, by reflection, on *one spot*, namely, the zero line on the drum, L, that supports the photographic paper or register enclosed in the dark box, M. The mirror, K, is simply adjusted by screw movements; the mirror, F, together with the electrometer needle, by aid of a mechanical arrangement fitted to the top of the electrometer.

The dark box, M, contains clockwork, by means of which a broad brass drum, L, is made to rotate, with an uniform motion, at the rate of one inch an hour. Over this drum a sheet of waxed-paper, prepared according to Mr. Crookes's formulæ,* is stretched, and clamped by two brass bars, with trigger catches, N. The rays of light reflected from the two mirrors, F and K, are admitted to the interior of this dark chamber through a narrow slit, O, in front of which a bar-shaped semi-cylindrical lens, P, is placed, so as to concentrate the rays to a focus on the surface of the sensitive paper. A conical tube, R, blackened on the inside, extends from the electrometer to the dark box, M, so as to exclude all extraneous light but that proceeding from the mirrors alone. Now it will be seen that whilst the rays reflected from the fixed mirror, K, will always fall on *one spot* on the paper, the slightest motion of the mirror, F, will cause a dot of light to fall upon the photographic paper, varying in position according to the amount of its deflection, to the right or to the left. Thus any electrical action effecting the needle will be indicated; for if the electrometer needle, E, moves, the mirror, F, must also move, and according to the amount and number of deflections of the needle so will there be corresponding curves impressed upon the photographic register paper, as it progresses onwards, as shown in the following diagram, which is a *fac-simile** of one of these records forwarded to me by Professor Thomson, who, from recent mathematical investigations, has given a value to such registers of the atmospheric disturbances that has hitherto been wanting.

These register papers show the actual electric condition of the atmosphere at the time and place at which they are exposed. While the air is destitute of electricity the spot of light reflected from the mirror, F, falls upon the zero line; but, according as the collector is charged from the atmosphere with negative or positive electricity, the spot of light traces the record on one side or the other of the zero line, the amount of disturbance being measured at any instant of time by the length of a perpendicular drawn from the zero line to the point in the curve occupied by the spot of light at that instant. These register papers prove, however, that the atmosphere is hardly ever in a state of absolute rest, electric disturbances of a greater or less extent being ever indicated.

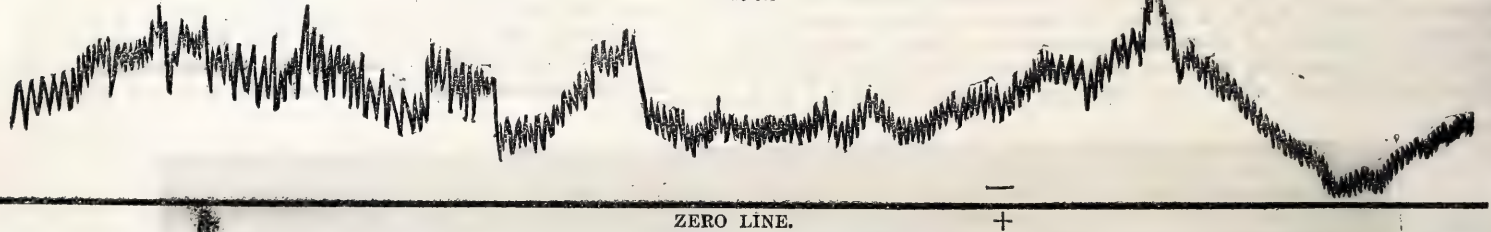
The mirror, K, which is an addition to the instrument as originally described, is for the purpose of laying down, photographically, the "zero line," which has otherwise to be ruled in, in ink or pencil, on the prepared paper before being placed on the drum. If, however, the paper is not very carefully adjusted on the cylinder, or vibrations are imparted to the instrument, the zero line will not be in true relation to the indicating lines of the mirror F. By this addition they are kept in unison with the self-printed zero line.

The glass vessel that encloses the torsion needle, E, to protect it from currents of air, also includes, as previously stated, a Leyden jar arrangement which is in connexion with another Leyden jar and torsion arrangement, S, which may be called the "tell-tale electrometer;" for before the apparatus is set to work, an electrode, T, common to both electrometers, is charged with positive electricity, and the charge thus imparted is kept as constant as possible: this is indicated by the "tell-tale" torsion electrometer, S, and when necessary the charge is again adjusted. The object of the electrometer, S, is to guage the amount of electricity communicated to the aluminium needle, E.

The air in each electrometer is kept dry by means of the sulphuric acid placed at the bottom of each glass vessel that forms the Leyden jar of the arrangement.

There are some other minor details; but, as our object is more to show THE PRINCIPLE of the method by which PHOTOGRAPHY is made available for registering the indications of scientific instruments employed in meteorological and magnetic researches, &c., we omit them, but refer those who may desire a more minute description

FIG. III



of the electrometers used by Professor Thomson to an abstract of a lecture he gave at the Royal Institution, published in the "Proceedings" of that Institution, from which we extract the following passage as illustrating the practical value of this very ingenious and important invention:—

"The water-dropping collector constructed for the self-registering apparatus to be used at Kew had been previously set upon the roof of the Royal Institution, and an insulated wire (Beccaria's 'deferent wire' led down to the reflecting electrometer on the lecture-room table. The electric force in the air above the roof was thus tested several times during the meeting; and it was at first found to be, as it had been during several days preceding, somewhat feeble positive (corresponding to a feeble negative electrification of the earth's surface, or rather housetops, in the neighbourhood). This was a not unfrequent electrical condition of days such as these had been of dull rain, with occasional intervals of heavier rain and of cessation. The natural electricity was again observed by means of the reflecting electrometer during several minutes near the end of the discourse; and was found, instead of the weak positive which had been previously observed, to be strong positive of three or four times the amount. Upon this the speaker quoted† an answer, which Prior Ceca had given to a question Beccaria had put to him 'concerning the state of electricity when the weather clears up.' 'If, when the rain has ceased (the Prior said to me) a strong excessive‡ electricity obtains, it is a sign that the weather will continue fair for several days: if the electricity is but small, it is a sign that such weather will not last so much as that whole day, and that it will soon be cloudy again, or even will again

* *Description of the Waxed-paper Process Employed for the Photometeorographic Registrations at the Radcliffe Observatory*, Oxford, 1854.

* The "zero line" is not laid down in the register forwarded to me, but is indicated in *fig.* 3.

† From Beccaria's first letter "On Terrestrial Atmospheric Electricity during Serene Weather"—*Garzegna di Mondovi, May 16th*, 1775.

‡ *i.e.* vitreous, or positive

rain.' The climate of this country is very different from that of Piedmont, where Beccaria and his friend made their observations; but their rule as to the 'electricity of clearing weather' has been found frequently confirmed by the speaker. He therefore considered that, although it was still raining at the commencement of the meeting, the electrical indications they had seen gave fair promise for the remainder of this evening, if not for a longer period. [At the conclusion of the meeting it was found that the rain had actually ceased. The weather continued fair during the remainder of the night, and three or four of the finest days of the season followed.] There can be no doubt but that electric indications, when sufficiently studied, will be found important additions to our means for prognosticating the weather."

The earth's surface is, in serene weather, generally, in most localities hitherto examined, found to be negatively — or resinously electrified, but sometimes, at instants, positively + or vitriously.

SIMPLE MEANS OF MAKING THE COLLODION FILM ADHERE TO THE GLASS.

A writer in *La Lumière* states that, having wished to try some iodised collodion that had been prepared about eleven years, he found it red, very fluid, consequently of little consistence and of feeble sensibility; but, on adding to it new collodion, it gave very beautiful proofs. This mixture, however, *per se*, readily became detached from the glass, on account of its non-adherent character.

He therefore endeavoured to make this otherwise valuable sample of collodion available by imparting to the glass plate an almost imperceptible film of albumen. This was produced by rubbing the surface with a pad of rag, over which had been spread one or two drops of albumen, the glass being eight and a-half by six and a-half inches in dimensions. The albumen was simply unbeaten white of egg in its natural state, without any addition, of such a consistence, that, on soaking a piece of rag or bibulous paper in a cup filled with the albumen, and rubbing it rapidly over the plate (at the same time assisting equal distribution by breathing on it), it formed a very thin pellicle, whose presence was only indicated by irisated shades. On coating the plate thus prepared with the non-adherent sample of collodion, it no longer broke away from the plate, even when put to severe tests.

The author recommends this simple remedy with confidence. The albumen thus applied does not give rise to striæ, &c.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The last ordinary monthly meeting of this Society for this session was held on Tuesday evening, the 4th inst., in the Lecture Theatre of King's College,—Joseph Durham, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed and declared duly elected members of the Society:—Earl Cawdor, R. C. Oldfield, Esq., and Major Shakspeare, R.A.

Mr. Vernon Heath rose, pursuant to a notice given at the last meeting, to draw the attention of the Society to the anomalous position in which photography had been placed by Her Majesty's Commissioners in the approaching great Exhibition of 1862. He was happy to say that after reading the forcible, logical, and excellent letter of their worthy President, his task had become much simplified; and he thought he might content himself with asking the Chairman to explain to the meeting what had occurred since that letter had been forwarded. Whatever answer that question called forth, he was sure the President's letter, and the manner in which the Council of the Photographic Society had conducted this question throughout, merited the warmest and best thanks of the members of the Society for their endeavours to place the art of photography in the rank which it ought to hold on such an important occasion.

The Chairman thought the best way would be for the Secretary to read the correspondence and the minutes of the meetings that had taken place since their last meeting. By that means every one would be put in possession of what had been done, and the results of such proceeding. Unhappily things had not gone exactly as he could wish.

[Dr. Diamond then read the correspondence which had taken place since the President's letter had been addressed to the Commissioners, which will be found under the head of *Photography at the International Exhibition of* 1862. [See page 214].

After a long sitting of the Council that morning it was determined to send another letter to the Commissioners on the subject.

Mr. H. G. Bohn was quite sure that photography was placed under the Fine Arts Department in the Exhibition of 1851. It came under his management as chairman of a sub-committee, in conjunction with Mr. Owen Jones, and was classed in connexion with colour-printing, which occupied a very prominent position among the fine arts on that occasion.

Mr. Malone said Mr. Bohn could not have noticed the remarks he had made at a former meeting. He was one of those who took part in the actual arrangement of the photographs in the Exhibition of 1851, and therefore he could speak most positively as to the place they then occupied in the classification. He had stated at a former meeting that a portion of the photographs were placed under the Fine Arts Department with the colour-printing, as stated by Mr. Bohn; but the best and greater portion of the collection was sent up into the gallery with the apparatus. On complaint being made a gentleman, whose name he need not disclose, decided in an arbitrary manner that no alteration could be made in the classification. He did not wish that this should be repeated in the forthcoming Exhibition.

The Chairman did not think it would be right for him under the circumstances, as the matter was in the hands of the Committee, to state on that occasion the course they intended adopting.

Mr. Vernon Heath thought that if the Council found it necessary to call a special meeting of the Society, every member would attend and support them in any course they might think advisable.

The Chairman stated that that was the determination the Council had arrived at.

Mr. Shadbolt wished to call the attention of the meeting to one point in the letters laid before them—namely, the cool assumption of the Commissioners that the Society was about to appoint a Committee to assist them in arranging the Photographic Department of the Exhibition, when they had been distinctly informed by the Lord Chief Baron that the Council refused doing anything of the kind until their just claims had been complied with. He thought they ought to record their strong and unanimous protest against such an assumption.

The Chairman said he might state that the Council had for the present declined to appoint any Committee for such a purpose.

Mr. Bedford exhibited several fine photographs, characteristic of his style, taken with one of Mr. Ross's orthographic lenses. A charge had been made against one of those lenses by a gentleman who had purchased one, that it was deficient in depth of focus, and otherwise wanting in necessary qualities. He had therefore tried the lens under the most unfavourable circumstances, by using an absurdly large aperture, and he had succeeded in taking a picture twelve by ten with a lens only intended for a field of eight and a-half by six and a-half inches. That was about the most severe trial a lens could be put to. The convergence of the lines in one of the pictures produced was owing to his having "cocked" the camera to get in the whole of Ely Cathedral. The exposures were about eight seconds for the exterior, and five minutes for the interior. He thought the result was a satisfactory proof of what that lens was capable of.

Mr. Shadbolt laid on the table two prints from negatives taken by the gentleman who complained of the lens to which Mr. Bedford referred, with that lens, and also two others taken by the same operator with another lens, to show by comparison the alleged inferiority of the former. He was informed that the malcontent asserted that the two sets of pictures were regarded by him as "corresponding subjects" respectively, but in both instances the subjects were really of an opposite nature, instead of similar in character; for in one the objects in the centre of the picture were the nearest to the spectator, whilst in the other the objects at the side were the nearest. In another pair of test pictures the objects were all in one plane: in the other there were several planes. It was, therefore, impossible to call these in any way corresponding or analogous subjects, and he thought any one so regarding them utterly unfit to judge of the capabilities of a lens. There was a mistake commonly made by photographers to which he might as well refer—namely, that a lens with a great "depth of focus," as they called it, must be a good lens. Now, in his opinion, a lens with great depth of focus was as bad a lens as could possibly be produced. The term "depth of focus" was in itself an absurdity, and only to be regarded as a myth invented by opticians either ignorant of their trade or for the purpose of deluding inexperienced photographers. Instead of good pictures being produced by a lens enjoying that property, it should only be regarded as a special contrivance for deteriorating the character of the picture. It was an impossibility for any properly corrected lens to render objects situated in different planes all equally sharp. "Depth of focus," in plain language, means *no focus at all*.

Mr. Sutton said there were two kinds of "depth of focus,"—that produced by a bad lens with a large aperture, and that produced by a good one with a small diaphragm. Mr. Shadbolt seemed to confound the two things together.

Mr. Shadbolt maintained that depth of focus was altogether a myth. By using a small diaphragm the rays formed a more acute angle, and objects that were out of the plane of focus did not appear quite so much out of focus as when the rays formed a more obtuse angle by the use of a larger diaphragm, and the result was that the image did not appear so blurred. In other words, by using a small stop "the circle of least confusion" was not so readily discernible.

Mr. Malone said Mr. Ross used the term "depth of focus," but in a correct sense. He quite agreed with Mr. Shadbolt that where all objects were made to look equally sharp and in their true planes, by using a small stop, there was no real depth of focus; but that was quite different from the real "depth of focus" produced by a lens of full aperture, where all the objects retained their true positions with equal sharpness. He knew of one lens now in daily use that took excellent portraits, and

was generally liked for giving that depth of focus that was so much approved of by some photographers; but Mr. Ross would have said that it gave no part of the picture in proper focus, for in such a lens there was no true or mathematical focus anywhere. So far so good; but he also thought it was quite possible with a good lens, and by proper management of the subject and the stop, to get one portion of the picture in focus and the rest but so slightly out as not to be perceptible. But to secure depth of focus by this means it was at the expense of a large portion of the light, and, with long focussed lenses, they might arrive at a point at which it would be impossible to secure actinic action on the photographic medium employed.

Mr. SHADBOLT again denied the possibility of getting two planes of equal sharpness at the same time. He thought that Mr. Malone had followed the French philosopher's definition, and had employed language to conceal his thoughts.

Mr. SUTTON had taken a picture with one object only twenty-five feet from him, and another a mile distant, and yet both were as sharp as could be desired.

Mr. SHADBOLT.—In that case, *no* object could have been properly in focus.

The CHAIRMAN said it had often struck him that photographers tied a lens down to do a single thing, and if it exceeded that they called it bad photography. It might be bad photography, but it was good art. He had seen photographs of landscapes, portraits, and groups, in which the camera lens had represented the object as his eye had seen it, and as Raphael, Claude, Turner, and other celebrated painters had seen and painted it; yet many photographers would call such photographs as he referred to, bad. They might be so to photographers, but they appeared very beautiful to him. Such failures were just what artists thought useful, though they were very difficult to get hold of; but, when secured, they were much prized.

Mr. SHADBOLT denied *in toto* the allegation of the Chairman, as applying to photographers and artists. He himself had just stated that no good lens would give two planes quite in focus at the same time: if either of them were in focus, the other could not be so. But in affirming this of a lens, he was only stating what was equally applicable to the human eye; but he thought it was true art to represent faithfully what was depicted on the retina. He was only contending for an optical principle, and, artistically, agreed with the Chairman.

Mr. MALONE said Mr. Ross had, some time ago, made a very beautiful lens, five inches in diameter, for the Austrian Government, and he had been invited to attend its trial. The object was a house on the opposite side of the street, about twenty-five or thirty feet distant, and they found that they could not get the iron railings in front of the house in focus at the same time as the bricks of the wall. They could not get what they called "depth of focus." Mr. Ross thought that they were unreasonable to expect to do so. They then tried a small lens, one inch and a-half in diameter and six inches focus, when they obtained both the bricks and the iron railings in presentable focus. Under some circumstances it might be necessary for photographers to use a smaller aperture than they generally ought to do, in order to obtain a given effect, as, although theoretically wrong, it was practically right.

Mr. VERNON HEATH then proceeded to read a paper *On the Applicability of Professor Way's Mercurial Electric Lamp to Photographic Purposes*, and to make comparative experiments between that form of instrument and Duboscq's carbon-pointed electric lamp. Whilst Duboscq's lamp emits rays of a purity and brilliancy almost equal to those of the sun, Professors Way's, from the nature of the electrodes, gives forth a light peculiarly deficient in the red rays of the spectrum, and consequently produces very remarkable phenomena with objects under the influence of its illuminating power. Thus, a crimson silk handkerchief appears *mauve coloured*, and "the human face divine" frightfully cadaverous and as if in an advanced stage of decomposition after death, whilst the lips appear purple. The persons present at the meeting had the aspect of a solemn conclave "*In Inferno*." With the assistance of Mr. Hughes, papers placed in pressure frames were impressed by the Way and Duboscq lights, under similar conditions, and pictures were produced by development printing in the course of a few minutes. An enlarged picture was also produced from an image thrown on a sheet of sensitive paper from a magic lantern arrangement, illuminated by means of the Way light. It was demonstrated that pictures could be rapidly impressed in the printing frame, but the arrangements were too imperfect for a fair trial as to the capabilities of this light for producing enlarged photographs, as the lamp leaked and allowed light to fall upon other parts of the paper than that whereon the image was projected, and during development diffused actinic light was reflected on to the moist surface of the paper: nevertheless a faint outline portrait was obtained, and there is little question that satisfactory pictures could be produced under proper conditions and more perfect optical arrangements.

Mr. MALONE objected to the experiments made that night being regarded as fair *comparative* tests as to the qualifications of the two lamps. As regarded the cost of the electric light he had some time since estimated the waste of materials at 10s. per half hour, while Mr. Heath considered it to be only 2s. per hour; but had he taken into consideration the loss of mercury that probably occurred every time the instrument was used? He thought the mercurial lamp was placed at an advantage over its rival, the carbon light of Duboscq, by having a glass shade placed over it (to retain the fumes) which would act as a reflector: this he thought was unfair, as it would be auxiliary to the effect of the mercurial light, whilst the carbon light was without such aid. Again, Duboscq's lamp was not the best form of electric light with carbon electrodes. A lamp had lately been introduced by M. Serrin, and that lamp ought to have been employed at any comparative trial of this kind. He thought he was only doing his duty to protest against the idea going forth that Way's light was the best for photographic purposes, or that it had ever been proved to be *better* than the ordinary electric lamps. He was at a loss to know why Way's light was better than that of M. Serrin.

Mr. V. HEATH denied that he had ever said the mercurial lamp was the very best that could be used for photographic requirements. All he had done was to bring it before the Society, to show what it did do, and leave those present to judge for themselves. He was in no way interested in advocating its use, but there was no question as to its superiority for photographic purposes over the carbon lamp before them. Instead of the glass over the mercurial lamp acting as a reflector it was a great disadvantage, as it became coated with mercurial vapour and so impeded the rays.

Mr. MALONE protested that it was impossible to say that the experiments just performed were comparable, and it was only misleading people to say that they were. He objected that the paper was placed much nearer to the mercurial than to the carbon lamp.

Mr. V. HEATH said Mr. Malone might have every facility for testing the qualifications of the two lamps. He begged to state that the papers were in both experiments at exactly the same distance from the source of light, the distance having been guaged by one of his assistants with a piece of string.

Mr. HIGHLEY remarked that, as Mr. Malone had laid much stress on the fact that Duboscq's light had been used in the experiments, which he (Mr. Malone) conceived was not so good a one as that recently invented by M. Serrin, he might state that the improvement in Serrin's lamp was not in the *quality* of the light given out, but in the mechanical appliances for securing a *continuous* beam. Any one in the habit of attending the lectures at the Royal Institution must be aware of the intermittent character of Duboscq's arrangement, and the annoyance resulting, from the light frequently going out in the middle of an experiment.

Mr. MALONE replied that if the light was continuous instead of intermittent, more light would be given off in the same time of exposure; therefore Serrin's would be better than Duboscq's light, even if the improvements were only of the mechanical nature described.

Mr. HIGHLEY begged to remind Mr. Malone that that evening an assistant had *secured* the continuous action of the Duboscq lamp by manually keeping the mechanical parts up to their work, so that the carbon light was as steady during the experiment as the mercurial one against which it was put to trial. Moreover, as the assistant had shielded his eyes with a piece of purple glass, and this was immediately behind the light, it acted as *a reflector* for the Duboscq, even better than the small glass shade placed over the mercurial light, to which Mr. Malone had raised objection.

Mr. HUGHES, in reply to questions put to him by various members, said that the print he had just taken by the lamp in five seconds' exposure was upon the same paper he employed in the solar camera, which was not the most sensitive. It was a paper which would enable him to expose until the image was distinctly seen. He could prepare paper that would receive an impression in one second's exposure. There was very little iodide employed in its preparation, but principally bromide and chloride. He then explained the construction of Woodward's solar camera he had intended using, in conjunction with the electric light, that evening, but which time would not admit of. He thought it would be very desirable if photographers could secure an artificial source of light, so as to render them independent of the sun, especially in a climate like that of England. It had been proved that evening that, with an exposure of five seconds, they could print from the negative, and that by a more prolonged exposure it was possible to obtain enlarged photographs by the solar camera arrangement.

Mr. V. HEATH said he had just been informed that M. Duboscq had experimented with the mercurial lamp before them, and had given it as his opinion that it was infinitely superior to his own for photographic purposes.

Mr. MALONE was glad to hear it. What he had said was, that they could not form any judgment on the relative merits of the two lamps from anything they had seen that night. He might say that, with the light produced by burning phosphorus in oxygen, pictures might be printed in five seconds, without going to the expense and trouble of the electric light.

Mr. SHADBOLT could not permit the opportunity to pass without saying a word or two relative to the solar camera. He now publicly stated his belief that it was IMPOSSIBLE to produce with such an arrangement a sharp image, whatever enlarging lens might be used. The condenser was an uncorrected lens, and no subsequent correction by passing the rays through another lens could remedy the evil caused by the decomposed light. In his opinion a mistake had been made in throwing the image of the sun on the front lens of the double combination, as it ought to be thrown somewhere between the two lenses to get the best effect. He merely commenced the discussion at the present moment, and he hoped Mr. Sutton would take up the gauntlet he had thrown down, and continue the subject at another meeting.

Mr. Sutton said it was too late at the present moment to begin such a discussion. All that he could say was, that he denied the accuracy of everything Mr. Shadbolt had stated. He contended that the condenser was quite good enough, and that any defects in it did not affect the result at all, and that the image of the sun ought to be thrown exactly on the front lens of the combination.

Mr. Malone said M. Claudet had just published a paper upon this camera, in which he stated it was perfectly useless to photographers unless it was made with the accuracy, and, consequently, costliness, of an astronomical telescope.

Mr. Sutton exhibited his panoramic camera and lens as made by Ross, and produced the first and only negative he had taken with it. The negative was curved, and embraced an angle of about ninety-five degrees.

The thanks of the meeting were then given to Mr. Vernon Heath, for the great trouble and expense he had incurred to place so interesting and instructive a subject before the meeting.

The proceedings terminated with the usual vote of thanks to the Chairman.

The next meeting will not be held until the first Tuesday in November

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary monthly meeting of this Association was held on Wednesday evening, the 29th ult., at eight o'clock, at Myddelton Hall, Upper Street, Islington,—George Shadbolt, Esq., V.P., in the chair.

The minutes of the last meeting were read and confirmed, and Mr. George Elphick and Mr. T. Hearn were elected members of the Society.

Mr. Barnett read a description of his *Vertical Camera for Copying* [see page 197], for which he received the thanks of the meeting.

The camera could be used for copying transparencies by placing it in a horizontal position, and Mr. Barnett stated that he had thus obtained pictures three times as large as the originals. It was elicited that the camera was of home manufacture, and was constructed of Quebec yellow pine.

The Chairman noticed this with satisfaction, but stated that Christiana white deal would answer better for the construction of the plate holder and dark slide; for though a trifle heavier, it is not so readily affected by moisture as regards expansion and contraction.

Mr. Highley stated that he had seen a large folding camera made of lime tree wood, which was excessively light, and seemed to answer for the purpose exceedingly well. He did not know whether any objection existed against the employment of that material for cameras, as its lightness was otherwise a recommendation.

The Chairman said that lime tree had a tendency to become rotten under the influence of moisture. He used that wood for cutting the edges of photographs on, before mounting them, as lime was a very homogeneous wood, and had not a tendency to produce asperities when the knife was passed in a direction crossways to the grain, as was the case with deal and many other woods. Lime wood was used by curriers to cut leather upon, in consequence of this quality.

Mr. Mainwaring said he employed glass for the purpose of trimming his photographs on.

Mr. Shadbolt having vacated the chair, which was temporarily filled by Mr. Barnett, he proceeded to read *Some Remarks on Mounting Stereographs*. [See page 197.] A vote of thanks having been tendered to him, he resumed his seat as Chairman.

A conversational discussion followed on some methods of mounting stereographic prints, in which Mr. Moens, Mr. Shave, the Chairman, and others took part.

Mr. Dawson stated that Mr. Sedgfield, who used a single-lens camera, adopted an ingenious plan for cutting his stereographs. He made pin holes on the margin of the negative, which were printed on the positive, and then he ran a quantity of them on long pins and stamped out a number of sets together. The result of this plan was that his stereographs were always uniform as to the parts introduced.

Mr. Hughes said Mr. Sedgfield also used a bi-lens camera. His plan was to cut the negative plate in two, transpose the two pictures and attach them permanently to another glass plate, and then print from them. He never separated the prints down the middle line, but cut them with two domes, so as to leave them united. He used a press like that employed by envelope manufacturers for cutting them. A great saving of time was thus effected.

The Chairman announced that Mr. Mainwaring had presented the Society with thirteen fine photographs, consisting of various groups of flowers, for which donation a vote of thanks was accorded to him.

Mr. Barber exhibited some photographs taken by the resin process. He used one grain of resin to the ounce of collodion. Those negatives taken without the addition of glacial acetic acid to the bath were very murky, whilst those taken with the maximum of acid, three minims to the ounce, gave clear pictures. Mr. Barber thought that on the whole this method gave promise of being one of the simplest of the dry processes, but he did not find it by any means so rapid as stated by Mr. Glover.

The Chairman said it was difficult for persons to work under exactly similar conditions so as to make fair comparative trials of new processes; therefore discrepancies resulted in reported trials by different operators. Mr. Glover had come to the conclusion that the minimum quantity of resin answered best; in fact he only used just sufficient to cause the collodion to adhere to the plate. It was necessary in this process to re-dip the plate after exposure, as was done by Mr. Corey, of Liverpool. The re-dipping in fact was half the battle. It was said that the exposure might be diminished one-third if this were done.

Mr. Barber said that perhaps the re-dipping adopted by those gentlemen accounted for the difference between his and their results. He would try that method before the next meeting.

Mr. Godbold had succeeded in getting a very good negative, free from spots, &c., ten by eight inches in size, in five minutes' exposure, at eight o'clock in the morning, by the resin process as described by Mr. Glover, but without re-dipping. He added one minim of acetic acid to the bath, and had sensitised the plate three days before using it.

Mr. Barber stated that d his plates had been prepared a week before using.

The Chairman said it would appear, *prima facie*, that acetic acid would be necessary when any organic matter was present in the collodion. One of the great defects of the process was that the film was very much inclined to wash off. Mr. Glover was of opinion that the pinic acid in the resin exerted some effect upon the preservation of the collodion in a sensitive state.

Mr. Barber thought the resin acted so as to protect the iodide of silver from atmospheric action. When any circular spots appeared he should feel inclined to flood the plate with spirit to equalise the distribution of the resin over the surface of the film.

Mr. Hughes referred to Mr. Hannaford's admirable modification of the Taupenot process, viz., the addition of nitrate of silver to the usual mixture of albumen, water, and ammonia, and treating such as a preservative solution. It yielded clean and uniform results over the largest plates.

Mr. Barber asked why that gentleman did not add ammoniacal nitrate of silver to the albumem in the first place, instead of first the ammonia and then nitrate of silver?

The Chairman said that both Mr. Hannaford and Mr. Barber advocated the same principle, though the latter's suggestion in practice was more philosophical. By adding the ammonio-nitrate of silver to the albumen the latter could not be over-dosed with oxide in an insoluble state.

Mr. Barber said that Mr. Hannaford called the solution "albuminate of silver," but albuminate of silver was insoluble.

The Chairman said the possible result of the solution might be albuminate of silver, as all the free ammonia evaporated whilst the plate was drying. If a solution of nitrate of silver in ammonia were evaporated the ammonia would fly off, and a grey powder would be left behind, forming with albumen an organic compound, which would fully account for the sensibility of the plate without the addition of more free nitrate of silver.

Mr. Hughes said Mr. Hannaford's idea was to combine the nitrate and the ammoniacal albumen together at once, instead of sensitising with nitrate first and then pouring on the albumen mixture, as in the old process.

The Chairman thought Mr. Barber's method was certainly a step further in the same direction.

The Chairman then said that notice had been given at the last meeting that the Committee proposed to alter the night of meeting from the last Wednesday in the month to the last Wednesday but one in the month, so that they might get an earlier report of their proceedings than was at present possible. They would in that case also have the advantage of meeting a fortnight before the London Photographic Society, which might be of advantage to many of the members who belonged to both Societies.

After some discussion upon the point, a resolution embodying the proposal of the Committee was carried unanimously.

The Chairman said that the alteration would be announced in the next number of The British Journal of Photography. The next meeting would be held on the 18th of September.

Mr. Godbold exhibited a print that had been toned by the old hypo. process, which he had restored after it had faded by means of a saturated solution of bichloride of mercury. It had assumed a very warm tone, although it had previously presented a dingy yellow appearance.

Mr. Hughes said it was well known that a saturated solution of bichloride of mercury would take out the yellow tone of a faded print, but how far the effect was permanent he could not say.

The Chairman said it was the first time he had heard of this method.

The proceedings terminated with the usual vote of thanks to the Chairman.

MANCHESTER PHOTOGRAPHIC SOCIETY.

This Society held its usual monthly meeting on the 5th instant,—Mr. Parry in the chair.

In consequence of the absence of the Secretary through severe domestic bereavement, Mr. Cottam again occupied his place. He showed some specimens of prints from hot water negatives, with which he had been very successful, and also exhibited a copy of the Cornwall portion of Domesday Book, photozincographed by Sir H. James.

Mr. Petschler showed some very beautiful prints from negatives by his process, which were much admired, both for the artistic feeling displayed by them, and also as specimens of the process. They were chiefly views at Matlock and Chatsworth. Some fine pictures by Mr. Wardley

were also handed round, and a splendid large view of *Conway Castle* by Mr. Rogerson, by the turpentine waxed-paper process, was presented to the Society's portfolio.

Attention was also called to the opportunity now existing in this Society for obtaining a large collection of photographs without the risk of an unsatisfactory exchange. The portfolio contains a number of prints on paper and on glass, and the offer of pictures in exchange is particularly requested in order that the scheme may be generally understood and fully tested.

The Chairman, referring to a letter which appeared in the last number of The British Journal of Photography, which speaks of dipping the plates at once in the hot water after coating with albumen, said that that was not to be recommended, as the drop which invariably forms at the corner would, on coagulating, not fail to damage either the plate to which it was attached, or by remaining on the surface of the bath would injure its successor. He exhibited a negative on waxed-paper coated with collodion, and dipped in the hot water bath. He then called upon Mr. Petschler, who read a paper *On a Modified Collodio-Albumen Process.* [See page 215].

After the reading of the paper, a discussion arose upon the subject.

Mr. Mann said he was very much surprised at the decision come to by the Committee in London who had reported upon this process and condemned it in such a brief and off-hand way that he could only conclude that, in consequence of the details of the process not having been sufficiently made known, it could not have had a fair trial, as he believed the objections raised by them were, on the contrary, not usually met with by those practising the process here.

Mr. Hooper asked Mr. Petschler what part he thought the ammonia played in the albumen? whether or not oxide of silver was formed by its introduction.

Mr. Petschler in answer, said that the ammonia would neutralise the acid state of the film; but he thought the most important part it played, was, that the ammonia must necessarily dissolve part of the chloride of silver formed on the surface of the film, and thus spread this salt more evenly through the albumen coating. After the ammonia had been driven off by the baking, the insoluble silver salts would be left behind, in a more finely divided and even state. With regard to the formation of oxide of silver, he could not speak with certainty, but he should think that the chloride of sodium in the albumen would decompose all the nitrate of silver, before the ammonia could deprive the silver of its nitric acid.

Mr. Cottam said that the ammonia, at first, had been introduced into the albumen to make it more limpid, and keep better, but he had no doubt it played an important chemical part on the film.

Mr. Wardley said he had used the albumen without the ammonia, and had good results; but he had no doubt it was better to use it.

Mr. Hooper suggested that, instead of slightly washing the plate after the sensitising in the silver bath, if the plate were thoroughly washed, and then dipped into a solution of nitrate of silver, say one grain to the ounce, a more uniform amount of silver might be got on the film.

Mr. Wardley, however, thought that when once the pores of the collodion film had been deprived of nitrate of silver, and soaked up with water, no silver could be introduced into these pores again to such an extent and so evenly as they had previously been.

Mr. Petschler quite agreed with Mr. Wardley on this point. He said the amount of water used was immaterial; only it must be applied gently and evenly, so that the mechanical position of the silver might be disturbed as little as possible.

The Chairman also quite agreed with what Mr. Petschler stated in his paper with regard to the washing after the silver bath; he thought they had made a great mistake to wash too much. He had found that his hot water plates had insensitive patches where the film had been too much washed, and that it was only necessary to remove the apparent greasiness.

The room was then darkened, and Mr. Petschler developed a plate which had been exposed that morning. He succeeded in producing a very satisfactory negative, full of detail and half-tone. It afforded the members much pleasure to watch the neat and clean manipulation of Mr. Petschler; and it was considered that a practical demonstration of this kind afforded more opportunity for acquiring an acquaintance with a process than any other plan.

Votes of thanks to Mr. Petschler for his paper, to Mr. Rogerson for his picture, and to Mr. Parry, the Chairman, concluded the business of the meeting.

The next meeting is fixed for the 3rd of July.

[We have been favoured with an opportunity of inspecting the proofs exhibited, and can testify to their excellence and abundance of half-tone. A little more bromide would probably have improved one or two, in rendering the green of some of the trees at Chatsworth not quite so dark; but they are very good.—Ed.]

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on the evening of the 5th inst., in George Street Hall, when there was a large attendance, every part of the hall being densely crowded by the members and their friends, nearly one-half of those present being ladies. The President (Mr. Marwick) occupied the chair, and in a few appropriate remarks explained that this was the first of a series of popular meetings which the Society intended holding at regular intervals, and it must be looked upon just as an experiment.

The Secretary (Mr. J. T. Taylor) then read a paper *On the Construction and Application of the Magic Lantern* [see page 218]; at the close of which above one hundred pictures were shown, as dissolving views, by Mr. Ramage, by means of the oxyhydrogen light. Many of these pictures were of great beauty, and called forth repeated applause.

At the close of the exhibition Baillie Blackadder proposed the thanks of the meeting to the two gentlemen who had so well entertained them. This was carried by applause; and after inspecting the lights, which had then been removed from the lantern, the meeting separated.

BRADFORD PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Society was held on Wednesday evening, the 5th inst.,—Dr. R. Parkinson in the chair.

After the minutes of the last meeting had been read and confirmed, the President called the attention of the members to the stereo lens by Ross, which was to be sold that evening to the highest bidder. A large number of members being present it was expected the lens would have commanded a higher price than it did: the Society, however, sustained no loss.

Many members spoke in very flattering terms of the tannin process, which they declared to be the most uniform process yet introduced.

Mr. Leather said he had lately been working some 10 × 8 plates, and out of a number had no failures that he could attribute to the process.

A Member hinted that it was difficult to meet with a collodion suitable for the process, as many he had tried would not stand the quantity of washing whilst it was desirable to give, to secure perfect results.

The President named a collodion which he said completely overcame the difficulty referred to.

Some conversation then took place in reference to a proposed excursion of the members, with their cameras, it being suggested that no doubt such would be advantageous to the health of the members, and might possibly increase the contents of their portfolio; but the matter, not coming strictly within the limits of the rules, was left for private arrangement, after which the meeting adjourned.

Foreign Correspondence.

Paris, June 10th, 1861.

We will, if so it please you, pay a second visit to the Exhibition of Photography in the Champs Elysèes. The crowd of visitors is large—much more so than on previous occasions of the same kind. True, the merit of the works exhibited, and the importance that photography has acquired among the industrial arts, count for much in the curiosity which attracts the public to the Palace of Industry; but, still, we who have for years past given to the improvements in photography all the publicity in our power, each one in his sphere, may we not say, without excessive vanity, that we have contributed our share to the creation of a taste for the new art? If photography had not had its press, its writers, its advocates, it would not have taken possession of the public mind to such an extent as it has done. That being said (and I trust we shall be pardoned this innocent vote of thanks to ourselves), I will proceed to our subject.

In my first letter on the Exhibition, I said I should have to speak further of the specimens of new processes which figure therein; and I alluded especially to the different methods of printing. One of the most important subjects which now occupies the investigators of all countries is the production of permanent pictures. Now, I believe that whoever has carefully examined the present Exhibition will come to the conclusion that the problem is solved. Putting aside the engraving processes, which constitute a particular branch of photography, I will speak only of the carbon printing processes. Three exhibitors have sent the results of their investigations in this direction: they are Messrs. Poitevin, Fargier, and Lafon de Camarsac.

M. Poitevin's system, as improved by its author, has been published, and I need not here describe it. It has not only the merit of bringing into play the hitherto unknown properties of certain substances, but it further possesses the advantage—and that a capital one—of being varied in its results and essentially practical. It gives images of excellent modelage, of vigorous tone, and as minute in their shades as are the most transparent pictures produced with salts of silver. The larger or smaller size of the *cliché* in no respect interferes with the operation. These are certainly conditions of great promise.

M. Fargier's method is, as you know, a modification of M. Poitevin's first process. It produces pictures of undeniable beauty. The shades are remarkably powerful, and the lights are of great

purity; but the difficulty offered by the manipulation of a collodion film floating in a bath, and which must be, so to speak, fished out before it can be mounted on the sheet of paper, limits the application of this method, which cannot, in its present state, answer the requirements of printing on a large scale.

As the processes of M. Lafon de Camarsac have not been published, they can only be judged of by the results obtained. Those results, which appear to be regular, have an artistic value of the first order. In all M. Lafon's pictures on enamel and on porcelain there are such contrasts of intense light and of dark shade, such delicacy in the modelage, and such finished detail, that they are really perfect productions.

This is how we stand in France at the present moment with respect to printing processes and to the very important question of the permanence of positive pictures.

In the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY there is a short article in which you compare M. Ferrier's instantaneous pictures with those by Mr. Wilson, and give the palm to the latter. I have seen Mr. Wilson's pictures, and think them charming; yet I am not of your opinion as to their superiority. Doubtless that gentleman has operated with extreme rapidity, and has shown great taste in the choice of pleasant picture-like sites; but you are only acquainted with the earlier essays of our fellow-countryman. For some time past he has been improving his process, and he has intentionally grappled with the greatest difficulties. Thus, he has not been merely satisfied with reproducing a crowd in motion: he has taken carriages moving across the field of the objective at a very short distance from the instrument—which you will allow to be far more difficult than to photograph a boat upon a lake or a sportsman firing his piece and, practically, posing as he is taking aim. Let me call attention to another difficulty surmounted by M. Ferrier:—One side of the Boulevard is in full sunlight, and the other in deep shade; and yet the passers-by on either side are depicted with equal clearness.

If I dwell somewhat upon this point, it is because M. Ferrier himself chose the most unfavourable circumstances in order that his success might be more striking, and, at the same time, all the more honourable to the photographic art. ERNEST LACAN.

New York, May 28, 1861.

THE May meeting of our Photographical Society was a brief one—in short, only long enough to get through a little customary routine, and to decently adjourn. The veterans of the Society console themselves with the fact that this is the first failure, and that for it there was an extraordinary cause. American science yields in a temporary access of inanition: it is a necessary *casus belli*. It was also a stormy night, and the few members who came, waiting for starlight, gathered in little social knots about the room. But little of the photographic was talked. Such words as "Sumpter," "Pickens," "Anderson," "rebels" (which an observer might catch above the hum), showed plainly where the minds of the speakers were.

I chanced, however, to be one of the group who found something besides the war of sufficient interest for conversation. We discoursed chiefly on the manufacture and properties of optical glass; arriving at the conclusion that the manufacture is exceedingly uncertain, and that apparently fine specimens of glass might so deteriorate as to be utterly worthless. Mr. Fitz (our most eminent manufacturer of telescopes), told us that he had seen a polished plate of glass become full of minute specks in every direction; that it was not a rare circumstance for a finished lens to become rough or covered with a film on the surface; and that it had been reported that one of the largest telescopes ever made was becoming useless, from deterioration of the object-glass. Mr. Fitz has just completed a dialytic telescope with an object-glass of sixteen inches aperture, which he considers the most perfect of his work. The glass was made in Lennox, Massachusetts, and was cut out of rough plate intended for skylights. Mr. Fitz procured it at the warehouse of the Company in this city, intending to use it for trials of his tools; but, after giving it a rough and careless handling for a month or two, he discovered that it was the finest piece of glass he had ever operated upon. Of course this specimen was a freak in the art of glass-making: the Lennox Company might not in a thousand years manufacture a mate to it. Mr. Fitz has looked at tons of skylight glass but has not found any which was not worthless for optical purposes. The telescope is valued at ten thousand dollars, and has been purchased by a gentleman in Buffalo, for the use of two daughters who are fond of star-gazing.

The conversation shortly turned upon the art of electro-plating; and Mr. Hilgard, of the Coast Survey, gave his experience in electro-coppering iron cylinders, under circumstances where the whole of the iron could not be entirely immersed. Mr. H. had once a good opportunity of observing the protective power of zinc towards other metals which are negative to it. The Coast Survey to which he was attached was sunk, and, being raised after a lapse of a few months, it was found that the magnetic and other metallic instruments which were packed in zinc boxes were perfectly preserved, so that they needed only to be wiped dry to look as bright as when the ship went down. The instruments in wooden boxes were thoroughly ruined, some of them only leaving their traces in iron dust.

You have heard of our fashion of Presidential electioneering by the aid of photography. During the late contest one of our New York establishments disposed of 100,000 medallion badges, each one containing one or two photographs. The most ordinary form is circular, and about the size of a dime, the picture on one or both sides being garnished with the gilded rim of the setting. These pictures of last fall were mostly positives on japanned iron; but lately photographs on paper seem to be preferred, and especially as they are cheaper and may be more rapidly produced. The specimens are supplied at the rate of two dollars per thousand: they are about one-third of an inch in diameter on albumenised paper, and are printed from a negative which yields two or three hundred at each exposure. A gentleman in this line of business, who has just called, says his greatest difficulty arises from delay in procuring negatives. In the first place, it is necessary to get a good photograph, then copy it to a large size, re-touch it, make fifty or more copies to a whole plate size, set them up conveniently, and make the negatives from which the pictures are finally printed. All these operations may consume two or three days, and the excitement which was to carry off his badges has subsided: perhaps his hero has made a fool of himself. These photographic badges are sold in the streets at five cents or more. CHARLES A. SEELY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

MR. NEGRETTI'S REPLY.

To the EDITOR.

SIR,—It may be a pleasure to some parties to write letters and to appear in print, but I cannot say that I share their happy feeling; and I should certainly forego the honour of seeing myself in your pages were it not that my silence would probably be misinterpreted. Mr. Hardwich, in your last number, kindly tells me, at the first onset, that he intends breaking a lance with me. Now, this is rather too bad, as if I had not enough with Mr. Ferrier on my hands, just now, without having Mr. Hardwich to cope with; however, of the two, I candidly confess, from what I know of Mr. Hardwich, I would rather deal with him. Let me, therefore, start by asking him if he has read my letters? Has my lecture on the albumen process, given some six or seven years ago, ever come under his notice? If so, I ask him did he detect anything in those letters to lead him to believe that my motives in writing or demonstrating were with a view to puffing or selling any particular camera, lens, paper, varnish, &c.? I am rather precise on these points; for many, in fact the majority, of the articles written or communicated by photographic tradesmen, may be looked upon as gigantic posters.

I flatter myself that Mr. Hardwich will exonerate me from having any way attempted to make a job of the albumen process. If I am correct in my supposition, will Mr. Hardwich tell me what motive I could have had in publishing what a contemporary of yours calls "an imaginary" process. Have not all the words I have said been directed against parties who, by attributing all sorts of absurdities in the working of the albumen process, were misleading and deterring persons from attempting it? Why should Mr. Hardwich, therefore, suspect that all has been a farce, and that *I* also have been misleading photographers? I have stated, and do so now, that for at least five years we printed on albumen plates. There have been a few exceptions, when we tried various experiments with a view of getting over the difficulty of the dust, which is in reality the only bad point with the albumen. I do not say that the process is not capable of any modification: I am not wedded to it, and shall only be too glad to adopt any other. Mr. Hardwich may infer from my reply to Mr. Lacan's letter, that I half fancy Mr. Ferrier has modified his mode of operating, this is probably the reason why I am suspected of having done the same. I can only say, I wish I could find a medium as hard and not liable to dust as albumen, then I would bid albumen adieu at once. Until then, Mr. Hardwich (as well as all others) must remain satisfied that we still work as formerly.

With reference to my asking for an evening at the Society's room, as suggested by Mr. Hardwich in his letter, I can only say that at present I have quite sufficient on my hands, as most of my friends well know, so that I must forego the pleasure of making my obeisance just now. Some of these days, perhaps, I may follow his advice, and *come out*. Until that time,—I am, yours, &c., HENRY NEGRETTI.

[*We* neither had, nor have the slightest doubt about the perfect integrity of his communication; which it is but justice to him to say was not volunteered but granted in accordance with our request, a circumstance most likely unknown to our worthy fellow-labourer Mr. Hardwich, who we are convinced did not intend to impute to Mr. Negretti any intentional sophistication of his process, but probably imagined from its great simplicity that some of the details were inadvertently omitted, as regards the attainment of the particularly pleasing "tones" of Messrs. Negretti and Zambra's productions.—Ed.]

AMATEURS' PHOTOGRAPHIC ASSOCIATION.

To the Editor.

Sir,—Whilst the Amateur Photographic Association has elicited an outburst of approval far exceeding the most sanguine expectations of its projectors, some few objections or queries have reached me which deserve, I think, to be noticed.

I will, for the sake of brevity, put them in the form of question and answer.

Objection 1.—Is it just that the prize negatives shall become the property of the publishers when the prizes are paid for by the Association?

Answer 1.—The prizes are *awarded* by the *Committee*, but *paid* for by the *publishers*. This objection, therefore, falls to the ground.

Objection 2.—Is it not an anomaly to declare that "none but amateur photographers shall be admitted as members," or, in plain words, to exclude the profession, whilst the fact is that as soon as a photographer takes to selling his pictures he becomes a professional, for professionals do no more?

Answer 2.—This objection I have placed in the strongest possible light, and it is exceedingly plausible; for although we well *know* the difference between an amateur and a professional photographer, yet it is difficult so to define the terms as not to lay oneself open to criticism. Suffice it, however, to say, that, whilst an amateur photographer is one who is wholly independent of photography, but practises it for the love of it, and who will love it none the less should he find that the public are glad to purchase copies of his pictures at such a price as to make his amusement self-supporting, a professional photographer is one whose income upon which he depends is derived wholly or in part from the practice of the art.

Objection 3.—Will not the selection of prints, the choice of negatives for publication, and other matters connected therewith, be apt to engender feelings of dissatisfaction or even mortification?

Answer 3.—It cannot be expected that a scheme so complicated and comprehensive will be altogether free from difficulties; and if the rules are somewhat vague on certain points, it is because it is thought that there are matters which will be better left to the judgment and management of the Committee and referees; and the public may well rely upon it that they will act with an impartiality above suspicion, that in no case need members select pictures inferior in quality to the negatives which they send, and that justice and liberality will be shown to all. In conclusion, sir, allow me to add that, although (as you well know) no thought nor labour has been spared in drawing up the rules, yet we do not pretend that the thing is yet perfect; but we do confidently believe that it is so substantially good that we may reasonably hope to make it so.

I am, yours, &c., A. MELHUISH, Hon. Sec.

P.S.—Since writing the above I have received a letter from the chaplain of H.M.S. ———, in which, after characterising the association as "the very thing we have long wanted," the writer asks one or two questions which suggest to me that it may not be unnecessary further to mention that the publishers alone are responsible for all expenses incurred, and no member can, under any circumstances, be called upon for anything beyond his yearly subscription, which, as usual, is payable in advance.

FAULTY PAPER.

To the Editor.

Sir,—Twice following, while working with two *different* samples of highly albumenised paper, I have had a large batch of prints ruined in a manner so strange and unaccountable that I would gladly call your attention, or that of some of your many readers, to the circumstance—feeling assured that you will not only not refuse to give me such information as will prevent my getting into the same difficulty again, but will likewise give me, if practicable, the probable reason of its occurrence, which was briefly this:—

The prints, after having been washed and toned with an alkaline gold bath as usual, were placed in a fixing bath of hyposulphite of soda—strength one ounce soda to one fluid ounce distilled water—and allowed to remain there about fifteen minutes. When taken out they appeared blistered all over, with marks much like smallpox, but convex instead of concave. These marks I cannot get entirely out, though they show much less when dry and pressed. I have only to add that I have been working with chemicals for some time, but have never had such an occurrence happen before.

I should feel very grateful for any information on this subject.—I am, yours, &c., MARTIN HENRY PAYNE.

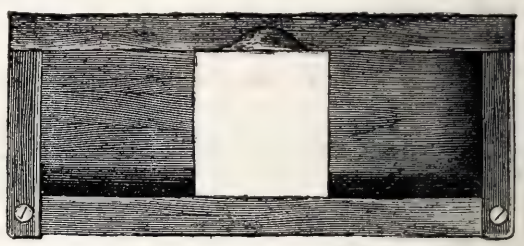
[We have no doubt that the fabric of the paper is in fault, not the albumenising; so that although you may have used two samples from different dealers, it by no means follows that the paper itself does not come from the same batch made at the same mill. On microscopic examination of the paper, the fibres appear to be more loosely agglomerated in some parts than in others—as it were in spots corresponding to the cavities. We can only suggest that you should moisten the proofs well just before mounting, in hopes that the tension arising from the drying in contact with the cardboard may remove the faults. Subsequent pressing may also do something towards this end.—Ed.]

PRINTING TRANSPARENCIES WITHOUT CUTTING THE NEGATIVE.

To the Editor.

Sir,—I was somewhat surprised, while scanning the pages of a recent number of your Jersey contemporary, to find a statement by the Editor (in one of his lectures to the students at King's College) to the effect that it is not possible to print transparent glass positives from negatives taken in the bi-lens camera without cutting the negative or positive. Such a statement, coming from such an authority, is likely to mislead those who have not given the matter consideration; and, by way of helping the lecturer over what he designates an impossibility, I would crave leave, through the pages of The British Journal of Photography, most respectfully to direct his attention (and that of your readers who are not already acquainted with it) to the method of doing so published in in the then *Liverpool and Manchester Photographic Journal* for May 15th, 1858.

The plan which I adopted much about the same time is I think more simple in manipulation, and does not involve the necessity of printing two plates at the same time, or taking the pictures on the ends of the plates with a blank space in the centre. My lenses are mounted three inches apart, and give proofs about three inches broad, so that it is only necessary to cut out the smallest possible slip of paper from between the pictures when mounting the ordinary paper proofs. The following diagram will make the *modus operandi* for glass positives easily understood.



Place the negative in the frame, face up, and push the end of it against the *right* hand side of the frame—the part of the negative to be first exposed will then be over the aperture in the bottom of the frame; then place the sensitive plate face down, the end of it against the *left* hand side of the frame—cover in with a shutter and expose: it will now be quite apparent that by moving the negative to the *left* and the sensitive plate to the *right*, and again exposing for the same length of time, the pictures when developed will be in the proper position for viewing in the sterescope. I am, yours, &c., A. B.

Edinburgh.

P.S. The aperture in the frame should be the exact size of each picture, and the spaces on each side of the aperture should be half the length of the stereo plate (whatever size is used), and in the resulting positive the two pictures will be edge to edge on the middle of the glass plate.

This simple plan is identical with that used in taking negatives with the single lens stereo camera, and was adapted from it.

PRESERVATIVE CASE PHENOMENON.

To the Editor.

Sir,—In photography everything strange should, if possible, be accounted for. As a student therein for some years, allow me to ask you for an explanation, if possible, of the following:—

Not printing every day, I purchased, two or three years back, one of Marion's cases; but I found that my prints with paper so preserved evidently underwent some chemical change, as they took longer to tone (gold and carbonate of soda) and were very much inferior to those printed when the paper was sensitised and used the same day; consequently, from time to time, I merely put therein the surplus fragments from sensitised sheets larger than were used, and intended to give the box the best of trials in the keeping point of view, in which I must admit it is very successful so far as keeping the paper white (other defects excepted).

Now comes the pith and substance of my inquiry. Last evening upon opening the case I found the inner slide (which encloses the preservative substance) perfectly saturated, and from out the box poured about six drachms of liquid, which to the taste was extremely bitter. Will you, if

possible, explain what change has taken place in the contents of the inner slide, and whether the preservative influence is gone. By so doing you will oblige an old subscriber to THE BRITISH JOURNAL OF PHOTOGRAPHY. I am, yours, &c., JOHN BOCKETT.

Kentish Town, June 5th, 1861.

[The explanation is simple enough. The preserving quality of the case depends upon the presence of a substance that has great affinity for water—that employed in the case you name being chloride of calcium. The quantity in your case is no doubt exhausted, having pretty effectually, as it appears, done its work, and should be replenished, when your case will be as good as new. The water which you poured out is of course saturated with the lime salt; hence the bitter taste. When using the papers thus preserved for printing, you should leave them in a dark place, but *exposed to the air*, for about an hour before putting them in the pressure frame, in order to allow of the absorption of a small quantity of moisture, as they are, when first taken out of the case, *too dry*. For reply to your other query see "Answers to Correspondents."—ED.]

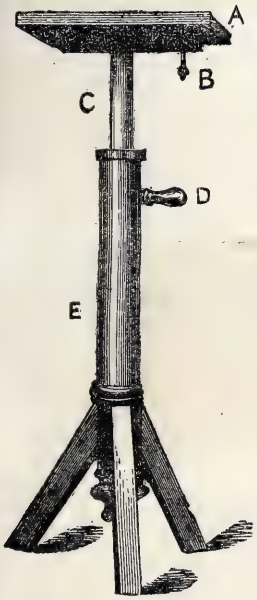
PORTABLE CAMERA STAND.

To the EDITOR.

SIR,—I beg to forward you, as per enclosed, a photograph of a camera stand for the operating room.

It is a very simple affair, consisting of a cylindrical pillar on three legs, into which slides a piston, carrying a board, to which the table is hinged. The movements are regulated by the two screws.

If you think it worthy, I shall be glad of a notice in your columns, as I intend bringing it into the market, believing it to be a novelty.



A Table, moving in any direction horizontally.

B Screw to elevate table to any pitch.

C Piston rising fifteen inches, or falling eighteen inches (two inches in diameter, eighteen inches long).

D Screw to fix it in position.

E Pillar three feet high, four inches in diameter.

When the piston is down, the board (which is one and a-half inch thick) carrying table rests on top of pillar.

I have not yet weighed it; but I can move it easily with one hand, and yet it is *very firm*, and *quite free from the slightest vibration*.

Waiting your opinion as to its merits, previous to advertising,

Bath. I am, yours, &c., W. CLARK.

APPARENT DISCREPANCY EXPLAINED.

To the EDITOR.

SIR,—I am so pleased with the "Amateur Photographic Association" scheme that I have returned the printed form, delivered with my last Journal, to Mr. Melhuish.

I wish to ask one or two queries, which, doubtless as a member of the Committee, you can, and with your known courtesy will, answer. In "Rule 10," I see—"The publisher shall print for the Association two guineas' worth of prints during the year from each member's negatives." Does this mean two guineas' worth from each negative, or two guineas' worth from all one sends? If the latter, which I rather suppose it means, it will be needless sending many negatives; for, supposing one sends a dozen, two guineas' worth would not be a print from each! And yet, "Rule 7. Each member will be expected to forward for publication, as well for his own interest as for the interest of the Association, as many good negatives as he conveniently can; and members sending *less than six* during the year may, at the option of the referees, be ranked as subscribers." These two rules do not work together. Can you assist me?

I am, yours, &c.,

Oxford, May 29, 1861. OXONIENSIS.

[Your note reached us only on the day on which we "went to press:" hence our delay in replying. We publish your note for the benefit of others who have also made inquiry on this point.

The Association is, *per se, not* a commercial undertaking; but in order to accomplish all the advantages contemplated some commercial risk had to be incurred by somebody. This has been undertaken entirely by the publishers, their remuneration being solely that arising from the printing, and the prospective advantage of gain of *prestige* by the firm. It is not meant that *only* two guineas' worth of prints should be struck off from each member's negatives, but only that number *for the Association* as an exchange club—that is, without the owner participating in the profit arising from the popularity of his productions. It is not likely that every member will confine himself to the two guineas' worth of proofs, though some may.—ED.]

A LETTER FROM MISS SPRIGGINS.

DEER MISTUR HEDDITUR

hi dessa u rekullekt mi muther a ritin 2 u about er givin hour litle sofi witch she korld er a *golding aird hangle* sum kallermel wen she wos took hill has she got horf uv hour jim's fotergruf kos u printed er lettur in the jurnle—wel muther wos a redin hof the jurnle yesterdi and ses she—wi theres a jentlemun a haskin—wot his sharpnis—hif eed honli kum ear ses she woodent hi soon sho im nithur—so ses hi—muther—wi donte u rite 2 the hedditur and tel im so—no ses muther hi got korld a littery karikter last time has I rote so hi hant a goin 2 rite agin jist now—so has hi think hit a pitty the jentlemun shooddent no wot sharpnis his hi thort hide jist rite miself and tel im ware 2 kum, but hi dun hit hunbenode 2 muther so no more hat this present time hof harskin from MARIA SPRIGGINS.

UNWASHED PYROXYLINE.

To the EDITOR.

SIR,—I should esteem it a favour if you would enlighten me on the following subject, through the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY:—

A short time ago I obtained a quantity of soluble cotton, said to have been manufactured after a formula of Mr. Hardwich's. This I made into collodion, and iodised it according to Mr. Hardwich's formula in the *Almanack* for 1861. Upon developing plates prepared with this collodion, the solution of iron, after two or three seconds, turns muddy, and the plate fogs all over. With pyrogallic there is no intensity and no half-tone, even with a long exposure, though the plate remains clear. The bath, which had previously given perfectly clear pictures with ——'s collodion, now fogs very much with it also.

I think I have a clue to this difficulty. Finding that the collodion liberated iodine rapidly, although the ether was good and free from acid, I tested a small portion of cotton that I had left: upon applying litmus paper damped, it immediately *reddened strongly*.

Would sulphur find its way into the bath by the above-mentioned collodion? and, if so, I should be obliged by your pointing out a remedy for the bath and collodion also.—I am, yours, &c., A VICTIM.

Hull, 5th, June, 1861.

[The pyroxyline was no doubt insufficiently washed, hence all the evils of which you complain. Your bath is most likely very acid, and probably contains organic matter. Over-neutralise the acidity by the addition of caustic potash or of ammonia, until there is a *slight* dark grey deposit; expose the bath to the light, filter, and finally add a drop or two of dilute nitric acid. See a paper by Mr. Barber on this subject, in page 159 of the current volume of this Journal. We do not perceive how sulphur can have been introduced.—ED.]

ALBUMENISING PAPER.

To the EDITOR.

SIR,—Can you help a photographic artist and printer in albumen with instruction for making albumen and albumenising paper. The great difficulty in obtaining a satisfactory article that is uniform in substance and in toning is so great, that if you can you will confer a positive boon upon a numerous class of admirers of your useful Journal.

I am, yours, &c., W. H. G.

[It is not often that we albumenise our own paper, but some years ago we conducted a series of experiments upon the subject, and arrived at the following conclusion, viz.:—that in order to obtain an even and brilliant surface it is needful to dry the paper *rapidly* after it is floated on the albumen, and to use the latter undiluted. The course we pursue in coating paper is as follows, viz.:—take the white of any convenient number of eggs and add to that of each egg five minims of liquid ammonia and fifteen grains of chloride of ammonium. Put all into a large bottle with some scraps of glass, and shake up the white into a froth; filter through a clean sponge in the neck of a funnel into a dish. Use Hollingworth's *thin* or else a good *thick* Saxony paper; float until it lies flat; remove and allow it to drip from *each corner in succession*, causing the sheet to revolve as it were on its centre as an axis; when the drip has nearly ceased, *hang it in front of a brisk fire*, albumen side next the fire, while you float and manipulate a second sheet of paper, and so on: finish the drying in a warm room. Keep your sensitising solution slightly acid with *nitric acid;* you will find this assists the subsequent toning operation in the gold bath.—ED.]

HOT WATER PROCESS.

To the EDITOR.

SIR,—I have already tried the effects proposed for the use of hot water. Make an edging of dilute albumen on the glass (one-eighth inch) and let it dry: it will be almost invisible. Any collodion will hold fast on this edging. Sensitise, and put the plate on a pneumatic holder; flush with water, and then pour over it the albumen. It is now only necessary to flush this albumenised plate with a dose of hot water (almost boiling) and it is finished. The plate, on exposure, gives a very satisfactory result.

June 1, 1861. C. E.

BLACK TONES.

To the EDITOR.

SIR,—Shall I be considered intrusive if I ask your Foreign Correspondent, M. Lacan, if he can assist me to the formula for obtaining the magnificent dark tones so generally given to the *cartes de visite* portraits by the French professionals? or is the process altogether a secret?

June 4th, 1861. I am, yours, &c., IGNOTUS.

A PAT ON THE BACK.

To the EDITOR.

SIR,—There was a paper read at a meeting of the South London Photographic Society, on the 17th ult., by Mr. Wall, *On Sharpness—What is it?* and a capital, good, useful paper it is, as well as the discussion which ensued on it.

There has been as much, or perhaps more, misconception and error on sharpness, even by our leading men, than almost on any subject connected with photographic pictures. Sharpness, or at least extreme sharpness, has been condemned over and over again, even editorially, as producing hardness. The assertion has been so often reiterated that it has become almost a settled conviction in the minds of some, that when the definition is very fine or sharp the picture must of necessity be hard. Nothing of the kind—never was there a more absurd statement.

Mr. Wall quoted a statement of mine, and I believe *photographed* my meaning so *correctly* that I wish to quote several remarks of his and Mr. Hughes's, wherein they *develop* so unmistakeably correct views on the subject, that I think (if not written in chloride of gold) they ought to be *fixed* in the mind of every photographer.

Mr. Wall says—"I would remark that the destruction of detail is neither more nor less than the destruction of gradation, upon which real softness and breadth to so large an extent are dependent. I cannot remove detail from any portion of a photographed surface without removing several of the more delicate tones which unite and blend the half-tints with the highest lights. I believe that perfect sharpness or focus tends to destroy outlines, secure gradation, and gives perfect modelling. There are certainly no such outlines in nature. On the contrary, the boundary of vision glides gently from our sight and dies softly away." Very good, and very true, Mr. Wall.

I differ with Mr. Wall as to using small stops: we are one as to sharpness, and as to fulness, gradation, and perfection of detail; and yet he seems to object to the means by which those effects are mainly produced, viz., small apertures. Let him take a landscape with the full aperture, focussed for the foreground, and his distance will be a confused, indistinct mystification, having none of the desirable qualities enumerated in the above extract.

Mr. Hughes says—"It was important not to confound *hardness* and *sharpness*, for they were very different." "Hardness was absence of half-tone and gradation" [true]—"a more rapid transition from high-light to deep shadow than was natural." "A picture might be sharp and hard or it might be sharp and yet soft." That's right, Mr. Hughes. "A picture might also be hard and not sharp at all. Condemn hardness by all means, but not the power of definition. Perfect sharpness was entirely consistent with perfect softness. A hard picture was an imperfect picture; for it gave only the highest lights and deepest shadows, and it exaggerated those. Perfect sharpness, however, defined not only high lights and deep shadows, but all the intermediate gradations and half-tints, and the presence of the latter constituted softness; therefore, a truly sharp picture was not a hard, but a soft, one." Very good, Mr. Hughes: that is *multum in parvo*.—I am, yours, &c., J. ROTHWELL.

ANSWERS TO CORRESPONDENTS.

⁂ We are again compelled to hold over a number of interesting articles in type. As nearly all the Societies have now discontinued their meetings for the summer months, we hope for some time not again to have to claim the forbearance of our valued contributors. We have made arrangements for a regular succession of important articles during the recess.

JAMES LARPEY.—In our next.

CANDIDA.—The best white is that of plain paper—far superior to that of any glass positive.

ROBERT HOLMES—C. JONES—J. A. S.—R. R.—F. SMITH.—See Mr. Melhuish's letter in our "Correspondence" column.

M. A.—THOMAS JULES—F. O. B.—CURATOR—SEL D'OR—FAITHFUL—BABE.—See reply to "Oxoniensis," and also Leader of the current number.

S. P.—We are unable at present to say how soon we shall commence; but you may depend upon it no delay beyond what is absolutely requisite will occur.

H. B., L. K. C., and NEMO.—You need have no hesitation in the matter: we can promise at least a courteous reception, and anticipate a hearty welcome.

HENRY C.—It is not that professionals are ineligible; on the contrary, they are admissible if they please to put themselves on the same footing as amateurs.

CHARLES ROBINSON.—You have only to apply to the Secretary, who will afford you all the requisite information. What you suppose to be impossible is, nevertheless, *un fait accompli*.

TOURMALINE.—We are of opinion that a rich field of inquiry is open for research in the region of polarised light and its bearing upon photography. Prosecute your experiments by all means.

W. BESSELL.—Pyrogallic acid kept perfectly dry, and protected from the air, will remain good indefinitely. If exposed to the air it turns brown, and this the more rapidly in presence of moisture.

INQUIRER.—There is no necessity for acetic acid when you use citric acid to restrain the too rapid action of the pyrogallic, except it be to modify the colour of the proof when printing glass transparencies.

TIMON.—A little more or less is unimportant as regards the final result. Give time enough, and do not be in a hurry with your manipulations. More plates are spoilt by over-haste than by bad chemicals.

JOHN BOCKETT.—The subscription to the Ray Society is *one guinea* per annum. You can procure any back volume that is in print by subscribing for the special year in which it was issued. You can obtain the rules on application to the hon. secretary, Dr. Lankester, 8, Savile Row.

G. J. T.—We are unable to give you the information desired about customs duties on photographic apparatus and plates on the Continent; but we advise that you should at any rate cover your plate boxes with a sheet of yellow glass, in case you find the officers persist in looking into them.

EUGENE.—You will find in the best of the albums for card portraits, where provision is made for two pictures to each leaf placed back to back, that the central blank piece can readily be *slid out* at the bottom of the thick leaf, which is really composed of three thicknesses of cardboard. The proofs are then to be introduced back to back instead.

GEORGE JUDKINS.—You can send mounted or unmounted positive photographs by post at the cost of one penny for four ounces of weight, provided that you send the packages *open at both ends*, though you are permitted to tie a piece of string round them to prevent them becoming detached from the envelope. Unmounted specimens are best rolled round a piece of cylindrical wood.

J. H. SLATER.—Focus your extreme distance as perfectly as you can, and it will certainly do for the clouds which you wish to take. The purer the bath the more rapid the impression. Your ideas are correct about intensifying clouds, if treated the same way as a landscape the effect is always heavy. We should *not* think the addition of so small a quantity of water to the bath of any consequence.

T. JONES.—Messrs. Horne and Thornthwaite keep boxes for stereographs that are thoroughly adapted for your purpose. They will contain about six or eight dozen of paper ones, and have one *end* hinged; so that by opening that as well as the top, and raising the pile of slides with the finger, they can be glanced quickly through like the leaves of a book, so as to find any particular one sought for.

R. B.—Not well grouped, and rather too near the top of the plate to look well: the left foot is also awkwardly posed, so that the effect of a very thick ankle is implied, and this effect is also exaggerated by slight over-development of the negative, which destroys the *roundness* of the part by want of shading. The same attitude, but with the left foot placed obliquely towards the operator, will entirely remedy the defect.

H. H. H.—If you will again refer to the copy of the rules of the Association you will perceive that, to become a *member* simply because you are a photographer, without furnishing any negatives, would be to obtain a *quid* without affording the *quo*. Members, in consideration of their supplying their quota of negatives, are entitled to have proofs at *half* the publishing prices. We cannot perceive the justice of giving to the bird that can sing, but won't, any advantage over the bird that cannot sing.

J. BOWEN.—Your plate would have borne a trifle more exposure with advantage, as you might then have stopped the development a little earlier, and avoided the spottiness of the ivy. Again: you would have had a more artistic picture had you selected a point of view a little more to the right of the position you took up; as the little tree behind the slope of the outhouse would have been more visible, and this would have broken the too stiff diagonal line at present existing. Your manipulation is very good. You will do well.

M. L. R.—Yours in common with several other letters only reached us on the morning upon which we were last "going to press," hence the unavoidable delay in replying to you. Thanks for your good opinion. It is not necessary to use fresh solution of hyposulphite of soda for fixing negatives on glass for every plate: on the contrary, you may continue to use the same solution over and over again until you find that it ceases to dissolve out the iodide of silver. It is only for paper proofs that a *fresh* solution is recommended, and that not for every proof but for every day's work. Your other query you will find answered in our Leader.

D. C.—The negative received wants further development; it is not nearly intense enough. You should develop very slowly upon waxed-paper, using but a few drops of nitrate of silver solution with your gallic acid until all the details are well out, after which you may bring up the intensity with a fresh portion of gallic acid and more silver solution, that is to say four or five times as much silver as at first. Some operators will take five or six hours in the preliminary development, and we have known twenty-four hours expended thereon on special occasions. When the negative is over-exposed, it begins to develop of an ugly reddish colour. Except in want of intensity there is not much amiss with your specimen.

A SUBSCRIBER.—No. 1 is "hard" as a rock—it is very evidently printed from an intensified positive as you state: no treatment could make a good picture of it. No. 2 is "flat" and wanting intensity, although it is like the other from an intensified positive; but it is better than No. 1, inasmuch as you have some half-tone. Your toning was carried a little too far, hence its pale colour. Negatives are quite as easy to take as good positives; but you had better try some other collodion: we have nothing to say against that you use, except that it does not appear to accord with your manipulation. To keep it firmly on the glass, rough the edge of the glass before use, and let the collodion set well. Send a stamped directed envelope and we will return your specimens.

JAMES LAW.—Your manipulation is unquestionably good, clean, and neat. There is, however, some want of vigour in your proofs, notwithstanding an evident under-exposure of your negative; hence we conclude that the collodion which you employ is, perhaps, somewhat deficient in iodising material, or else in pyroxyline. Of the proofs received that of Annaty Burn is decidedly the best, and is, in fact, good in every respect, but in want of a little more vigour. Strathbraan comes next in excellence; but the large fir tree in the foreground is manifestly under-exposed. The water in the fall of Moness is too hard and chalky, and that in Glenalmond is still more so: both of these slides require very much more exposure—twice, or even perhaps thrice, as long as you have allowed. In the absence of any definite information from you, we can only indicate a course of proceeding contingent upon certain facts being correctly guessed at. If your collodion be *very* thin and fluid, add a little more pyroxyline. If it contain no bromide of any kind in the iodiser, add about half a grain of bromide of ammonium or cadmium to each ounce of collodion. If the sensitised film be pale and translucent, add more iodising solution; and, lastly, give longer exposure than you have hitherto done. The detail is all good in the foliage in Annaty Burn; but it is too faint. It is probable that, from want of a sufficient quantity of iodide of silver it was impossible to get up the intensity by development: hence our advice to add more iodising material. You need make no apology for seeking our aid: it is always cheerfully and honestly afforded.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 145, Vol. VIII.—JULY 1, 1861.

Halation.—The author of a paper entitled *Halation—Its True Cause and Remedy* (see No. 140 of this Journal for April 15th), has taken umbrage at our remarks, both oral and editorial—at least so we gather from the tenor of an article which appeared in the last number of the *Journal of the Photographic Society* by the same gentleman, entitled *A Reply to Various Objections*, &c., wherein he figuratively pours boiling oil on the heads of all who presume to differ from him in opinion; but we personally come in for a double share of his animadversions, and if we do not tremble thereat it is simply because we are incorrigibly hardened. But to drop bandinage, we are really sorry that this last article was not sent to us, for we make it a rule to publish *in extenso* every complaint against ourselves; and this we have invariably done, with one solitary exception, in which the excepted communication was marked "*private*," and we could not prevail upon our correspondent to grant, although we earnestly solicited, his sanction for the insertion of his letter.

With regard to the subject before us, we can only refer those of our readers who take an interest in the matter to the Society's Journal, pp. 210 to 213 inclusive, for the article is far too long for a mere reprint. We shall notice one or two of the points adverted to, and leave the rest for others to deal with if they see fit to do so.

We find:—"Notwithstanding Mr. Shadbolt's endeavours to establish his views, and make the name he would apply to certain phenomena binding on every photographer," &c. We had no particular views to establish, nor did we contend for the appropriateness of any particular designation as applied to a phenomenon termed "halation," and which was certainly none of our devising; but we have some pretty extensive experience regarding the terms *generally* employed by photographers and the sense in which they are used, and we again affirm that by "halation" what we described at the meeting is what is *generally* understood. We are unconscious of having exerted any "strenuous endeavours" "to ridicule the title of the paper," though we certainly perpetrated a mild joke upon it when specially called on by the Chairman to speak.

Much fuss is made by our opponent about some fancied discrepancies between the reports in this and in the Society's Journal, which, though taken by separate reporters, rather remarkably corroborate each other's accuracy in the main; for instance, Mr. Archer's tent in one report is called a camera in the other—appropriately enough, for his tent and camera were united in one article.

While on the subject of "reporting," we notice a remark towards the close of Mr. Marlow's article, relative to what he calls the "wise omission" of certain observations in the Society's Journal which were published in this Journal. They were *not* reporter's imperfections, as he suggests, but statements of what actually occurred; neither were they *in reply* to questions, as he funnily insinuates. If a question be asked, to which no one cares to reply, is that of necessity to close all discussion? If our objector were to attend many photographic society meetings he would soon learn to know the *value of abstaining from reply* upon some occasions.

"Mr. Shadbolt's belief" in black velvet is just what it was; for, as regards the experiments performed in the pressure-frame, we do not value them at all with reference to this question. We were so astonished at finding what was the subject of the paper after hearing the title of it read, that our attention was not for some time after its commencement directed with any degree of concentration to the former—hence we may have missed some points therein; and our editorial comments were certainly written and in type ere we had an opportunity of perusing the paper itself, and therefore we had nothing but memory on which to depend.

Mr. Marlow appears to be eminently dissatisfied with *all* who took part in the discussion, which is a pity, but, we presume, unavoidable under the circumstances. Our principles will not allow us to offer him space in these columns to vent his ire upon others; but we can honestly say that he is quite welcome to such as he may require for any directed against us, if he will accept it.

Large Lenses.—By the special desire of Herr Voigtlander, the celebrated optician, of Vienna, we have been favoured with a series of unusually large-sized portraits for critical examination: they are the production of Herr Wegner, of Amsterdam, by aid of one of Voigtlander's gigantic double-combination lenses. Of these portraits there are twelve in number, each plate being not less than seventeen inches by fourteen in dimensions. In one proof there is a group consisting of two ladies, in another of a gentleman and two children, the remainder being single figures. Some idea of the scale upon which the delineation is effected may be gathered from the fact that the length of the faces of the figures represented averages about two inches. The lens employed was the No. 8, of five inches in diameter. We cannot omit this opportunity of according willing testimony to the artistic skill of Herr Wegner. Each portrait is a perfect study in itself, and would, were the Royal Commissioners for the International Exhibition of 1862 open to reason, be alone sufficient to refute the preposterous notion entertained by them that photography is a mechanical art. The individuality of each sitter is not more perceptible than the individuality of the artist, who has unmistakeably left on each picture the impress of his own mental labour. But this is somewhat of a digression, and we return to consider the operation of the lens, which was the point to which our attention was solicited. We are assured, by the way, that the specimens submitted to us are perfectly "untouched;" and indeed they bear evidence to the verity of the assertion. As large specimens for suspending on the walls of a room they are truly admirable, and so presented are not subjected to the close scrutiny to which ordinary photographic portraits are exposed; but when closely

examined they certainly present certain defects to which all images of objects not in one plane, and delineated by aid of lenses of large aperture, are more or less inherently liable—that is to say, the faces of the sitters give one a notion of being inspected through a magnifying glass: every crease and wrinkle, nay the very texture of the skin also, are somewhat painfully apparent; while certain objects are to some extent unnaturally thickened, such as the hair of the beard and whiskers in the male sitters. But, on the other hand, the textile fabrics composing the various dresses are distinctly rendered. The reason for the existence of this peculiarity is sufficiently obvious to those acquainted with optical science; and the better the lens the more perceptible is the difference of distinctness between the parts to which we have alluded. Operators who are ambitious of working with very large lenses become involved in very unexpected difficulties: not only do the photographic manipulations require more care, but optical troubles of no trifling kind are superadded. If the artist lacks a knowledge of that science with reference to the action of lenses—as is most frequently the case—he naturally lays all the blame of his ill success upon the unfortunate maker of the lens, because he is well assured that his photographic dexterity in all that regards the chemical part is not deficient.

It must not be supposed from these remarks that we are in any way detracting from the merit of the optician who produced the lens with which the specimens upon which we have been descanting were taken, nor from the excellence of the lens itself—on the contrary, we estimate them both highly. We consider that the lens is as perfect as it is possible for a lens of its size to be made, and, further, that in Herr Wegner the maker has found one who has known well how to apply it; but we could not allow so appropriate an opportunity to pass by without recording a word of caution to those who imagine that, if they do but obtain a large lens, of good quality, they will necessarily be able to execute large portraits of a satisfactory character as easily as they can small ones.

Preservative Plate-box.—We have recently received from Mr. A. Keene, of Leamington, a specimen of his new plate-box, for preserving undeteriorated sensitised dry plates. It is constructed of block tin, with grooves of gutta-percha, or some similar material, of a form that precludes injury to the film. There is ample provision for perfect exclusion of light, and a simple arrangement to obviate the accidental opening of the lid. The whole is well designed, compact, and appears to fulfil its intended object.

Redivivus.—It is with gratification that we notice the reformation of the Chorlton Photographic Society under the presidency of Mr. J. Heywood. It is always to be regretted when a bond of union that has been in existence for any considerable time becomes broken; and we cannot but rejoice that the new Society has arisen, phœnix-like, ere the ashes of its predecessor had become cold.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

The series of papers which we now commence is undertaken with the object of placing before our readers a description of the means by which the quality of the chemical preparations used in photography can be ascertained.

The necessity for such information will be obvious to all scientific students; and those photographers who practise the art by "rule of thumb" must be no less convinced of its utility, after a very little experience. The last-named practitioners cannot be occupied in any process very long without discovering that their guide-books and chemicals can only produce failure, notwithstanding the "*dreadful facility of the camera*," unless they be properly informed as to the nature of the chemicals employed. For apparatus cannot do everything: the process is essentially chemical; and, if the material be impure, the result cannot be satisfactory. There is, in point of fact, no requisite for which the unscientific photographer is so much at the mercy of the shopkeeper as his chemicals. It is further intended that those who are at a distance from "home"—men "up country" in the Australian bush or Indian jungle, quite beyond the reach of chemists' shops—should, from these papers, learn the method for supplying themselves with the chemicals they require.

To illustrate the necessity for such instructions as we propose to give, we will cite the case of the phosphates and carbonates of soda—substances now largely employed in the new method of toning paper positives.

Without alluding to the fact that the acid which forms the first class of salts is capable of existing in three different conditions, viz., monobasic, bibasic, and tribasic—each one of which forms with soda *a* phosphate of soda—it is sufficient to mention that the ordinary tribasic modification which is usually employed is capable of crystallising under different circumstances with fourteen and twenty-four atoms of water of crystallisation respectively. And as it is manifest that these two salts must contain a very different per centage of anhydrous phosphate, the importance of knowing which salt is supplied becomes obvious.

With reference to the second class of salts—the carbonates of soda—similar remarks apply with equal force. Carbonic acid combines with soda in three different proportions, forming three separate and distinct salts, all three of which are to be found in commerce under the general name of carbonate of soda; added to which, the commonest of them, *the* carbonate of soda, may, by particular treatment in its preparation, be had with seven, nine, ten, and fifteen equivalents of water of crystallisation, possessing, of course, a corresponding variation in the proportion of anhydrous carbonate contained in equal weights.

These instances sufficiently show that success in photography depends not only upon the chemicals being accurately prepared and without adulteration, but also upon their composition and qualities being known to the photographer who employs them.

The arrangement adopted in the following papers has been resolved on by the writer after careful consideration during the last eighteen months, while engaged in collecting the information now brought forward; and, in view of what has been said above, they will necessarily contain a statement of the *impurities* which may occur, and the method of ascertaining, by *tests*, the presence of those impurities in photographic chemicals. The method of *preparation* will also claim to be accurately treated. In addition to the ordinary name of the compound, its *synonymes* will also be mentioned, while its *composition* and *equivalent* will be expressed in the manner employed by Berzelius and Turner. The *uses* or *method of acting* in photographic processes, with the ordinary *physical characteristics* and *per-centage of pure in the commercial article*, will also be stated. Subsidiary, also, to the more immediate object in view, it has been deemed advisable to include a statement, where practicable, of the *effect* of each substance *on the human body*, with its appropriate *antidote* where injurious.

Where desirable, also, the *specific gravity* will be stated, and, further, the *boiling point* of liquids, with the solubility of certain salts in water, alcohol, or ether (whichever may be their most suitable menstruum), likewise the proportion necessary to make a saturated solution.

As an important chemical agent, we will commence with—

IODIDE OF POTASSIUM.

Synonymes.—Hydriodate of Potash, Ioduret of Potassium.

Composition.—K.I.

Equivalent.—166.

Preparation.—This compound, so important in a medical as well as a photographic sense, may be prepared by three different methods. The one most generally adopted is that in which iodine is added to a solution of caustic potash until it becomes coloured; the solution so obtained (consisting as it does of iodide and iodate of potash) evaporated to dryness, heated to redness, and crystallised by resolution in water. It may be obtained, also, by adding iodine to a hot solution of caustic potash to saturation, and then decomposing the iodate of potash formed by passing a current of sulphuretted hydrogen through the solution. Any excess of sulphuretted hydrogen may be expelled by heat, and the solution, being filtered and neutralised with potash, may be evaporated and set aside to crystallise. By the third method, iodine, water, and iron filings, or scraps of zinc, are digested in a Florence flask with a gentle heat until the combination is complete, which is indicated by the solution becoming colourless: it is then filtered and exactly decomposed by a solution of pure carbonate potash. The precipitate of carbonate of iron or zinc resulting from this reaction is then

separated by filtration, and the clear solution evaporated until it crystallises. This last method will be found the most practicable for amateurs desiring to prepare only a small quantity to meet their immediate wants. The chief point to be attended to in order to insure a satisfactory product is the careful decomposition of the iodide of iron or zinc with the solution of carbonate of potash. If too much of this be added, the resulting iodide is contaminated in a way which will surely mar the delicate reactions which occur in photographic manipulation; if the quantity of carbonate, on the other hand, be insufficient, some undecomposed iodide of iron or zinc remains in solution, producing a corresponding contamination with one or other of these metals. Both these untoward results may be avoided by having the solutions fairly diluted, and adding the carbonate cautiously and just until no further precipitate is produced and no more.

Properties.—Iodide of potassium forms semi-opaque white cubic and prismatic crystals. They are anhydrous, and slightly deliquescent in damp air. One hundred parts of water, at 65°, take up 143 of this salt. It is only sparingly soluble in absolute alcohol; but much more so in alcohol, sp. gr. ·850, which takes up about 70 grs. to the ounce. It should be purchased in crystals, which ought not to be very deliquescent, and should perfectly dissolve in six or eight parts of alcohol, sp. gr. ·836. Iodide of potassium is insoluble in ether.

Uses.—Iodide of potassium is employed in nearly all the more important photographic processes, for the purpose of producing by what is termed double decomposition an iodide of silver, either in a film of albumen or collodion, or on the surface of a sheet of paper. The solutions containing it, alone or in combination with other iodides, are called "iodisers," iodising compounds, or iodising solutions.

Impurities.—A very pure form of this salt is now introduced into commerce, prepared expressly for photography, and obtainable at any of the more respectable houses where photographic chemicals are sold. The ordinary kind prepared for medical use is frequently contaminated with the following impurities:—Carbonate of potash, sulphate potash, iodate potash, and chloride potassium. Their presence may be ascertained by the application of suitable

Tests.—Namely, chloride barium, nitric acid, lime water, and tartaric acid. The suspected salt is first dissolved in pure distilled water; and if, on the addition of solution of chloride of barium, a white precipitate is formed, it is an evidence of the presence of either carbonic, iodic, or sulphuric acids. Nitric acid should then be added, when, if it be the two former acids, the solution becomes clear; but if it remain turbid, sulphuric acid is undoubtedly present. Iodic acid will be indicated, if present, in the following manner:—To a solution of the salt in pure distilled water add a small crystal of tartaric or citric acid, when, if iodate of potash be present, the solution will speedily become coloured from the liberation of free iodine. Carbonic acid, in combination with potash, will be indicated by dissolving a small portion of the salt under examination in lime water, to which it will communicate a turbidity, if present. If, however, it forms a clear solution, the absence of carbonate of potash may be inferred. The detection of chlorides in iodide of potassium is conducted as follows:—Solution of nitrate of silver is added to a solution of the salt to be tested, until it produces no further precipitate. The precipitate is then collected on a filter, copiously washed with pure water, and finally washed with strong solution of ammonia. To this ammoniacal filtrate, nitric acid (pure and quite free from hydrochloric acid) is now added, when, if chloride of potassium be present in the iodide, a white flocculent precipitate of chloride of silver will be thrown down.

Effect of Internal Use.—Iodide of potassium is employed medicinally as a stimulant to the absorbents: it acts also as an irritant, and is diuretic. When taken in such quantities as to produce poisonous effects, the symptoms are violent shivering, headache, hot skin, intense thirst, quick and full pulse, vomiting and purging, and great prostration, with discharge from the eyes and nostrils.—*Taylor.*

Antidote.—As there is no known antidote to this salt, the best course to adopt is to evacuate the stomach by emetics, or even by the stomach-pump If there be no excoriation of the mouth and fauces, give stimulants; also demulcents, such as milk, white of egg, linseed tea, &c.; obviate inflammation, and allay irritation.

THE WAXED-PAPER PROCESS.

By John Traill.

[Read at a Meeting of the Edinburgh Photographic Society, on June 19th, 1861.]

On the comparative advantage of glass over paper or paper over glass as *media* for the reception of negative pictures I will not enter at present, beyond remarking that, if glass is most suitable for very minute detail, paper is infinitely more convenient to the tourist.

There are not wanting some who say that equal sharpness—not, of course, alluding to microscopic sharpness, but sharpness sufficient for all artistic purposes—may be attained equally well with waxed paper as with collodion. So much is this the case that positive prints have often been exhibited so sharp as to have been thought impossible to have been produced from paper, having been mistaken for collodion.

I now proceed to show how waxed paper is prepared.

The original way was this:—On a flat warm surface—a plate of metal, a porcelain dish, &c., &c.—lay one or two sheets of paper; rub it over with a piece of white wax, which will melt by the heat and permeate the pores of the paper. The sheet is now placed between two folds of blotting-paper and a hot iron, such as laundresses use, passed over it. The bibulous paper absorbs the superfluous wax, and the sheet is removed and ready for the next operation.

But more improved methods of waxing paper have been introduced, and the following is one which gives good results:—Put into a bottle or glazed earthenware vessel the following:—

Camphine	5 ounces.
White wax	½ „
Iodine	½ drachm.

The application of a slight degree of heat will dissolve the wax. Paper is immersed into this, and when saturated, which takes a few minutes, may be removed and dried by hanging up. It is advisable that both for this and the subsequent operation a large number of sheets be prepared at once, as the trouble is very little and the papers keep any length of time.—The next operation is that of iodising. Into a deep dish pour some of the following solution:—

Iodide of potassium	300 grains.
Bromide of potassium	100 „
Iodine	3 „
Water or serum of milk	20 ounces.

Immerse, one at a time, the papers into this, taking care that each is thoroughly wetted, no air bubbles being allowed to adhere to the side. It is, perhaps, desirable that not more than a dozen sheets be immersed into the bath at a time; but this of course depends very much on the depth of the dish and the quantity of the iodising solution. A small glass rod assists in getting rid of the air bubbles which would attach themselves to the sides. When all are immersed they should be allowed to remain so for a considerable time—say two hours. I often immerse a batch of papers in the morning the first thing after rising. These are ready for removal at breakfast time, which being done a fresh set is introduced and suffered to remain until dinner time, when a third set takes the place of the others, remaining till evening. In this way three dozen sheets 12 × 10 are prepared in a day without encroaching in any way on business hours. I may observe that it is just as easy to prepare a large sheet as a small one, at least after one or two trials. When removed from this iodising bath the papers are hung up to dry, and will keep any length of time. They are now of a deep purple colour.

To excite for use, which I usually do a day or two before I wish to use them, I immerse them singly in a solution as follows:—

Nitrate of silver	30 grains.
Glacial acetic acid	30 drops.
Water	1 ounce.

The usual precautions as to air bubbles must be observed, and when a sheet is immersed the purple colour will vanish and be succeeded by a deep primrose. After remaining about eight minutes each sheet should be removed into another bath of water, and agitated so as to effect a removal of the excess of nitrate of silver.

The more washing the papers get the longer they will keep, but the less sensitive do they become. With a moderate washing I have taken very fine negatives on the tenth day after they were excited. They may be dried either by being hung up in a darkened room, or by being pressed between two folds of clean blotting paper.

The exposure in the camera is nearly the same as that required for a dried collodion plate. There is, however, a considerable latitude in this process, as I have taken two views of the same subject at the same time, and given one of them double the exposure of the other—the two negatives presenting the same appearance when finished. The exact exposure requisite for producing the best effects must be determined by each one for himself, commencing with four times the length of time a wet collodion plate would be exposed under similar circumstances.

I have said the papers will keep ten days or more, but it is desirable to use them within as few days as possible after they are excited, as they deteriorate.

Each operator has his particular way of development. The following answers perfectly:—Into a flat porcelain or glass dish pour a saturated solution of gallic acid, to which some of the sentitising bath has been added in the proportion of a drachm to every four or five ounces of the gallic acid solution. Immerse the negative into this, and in a short time the highest lights will make their appearance. When the details are all judged to be out the sheet may be examined, and either fixed or returned to the developing dish, as is found to be requisite.

I fix in a strong solution of hyposulphite of soda.

PHOTOGRAPHY ONE OF THE FINE ARTS.

By S. Thompson.

Before crossing the threshold of any discussion on photography as a fine art, the question that naturally suggests itself to every mind is, what are strictly speaking the fine arts? What constitutes an art a *fine* art, taking precedence of *ordinary* arts? What *is* a fine art? and what *is* an ordinary or mechanical art? Much misapprehension exists, it is to be feared, on the subject. Ask twenty ordinary persons to define them, and you will probably get twenty definitions. But, nevertheless, the best understood distinction among the cultivated classes is that those arts requiring a greater amount of intellectual refinement and fine taste, combined with judgment and manipulatory skill, such as painting, music, sculpture, and architecture, have been separated from the arts generally, and designated, by way of distinction, "the fine arts." I would hazard a more subtle distinction. It is obvious that an art which every one may acquire and practise alike successfully cannot be other than one of the mechanical arts, such as our juvenile "million" is apprenticed to daily, and, having served the appointed time, practise forthwith for the remainder of their existence, with a degree of success almost wholly regulated by capital and character. Can the fine arts be thus taught? Painting, strictly speaking, embraces all methods of producing represen tations on flat surfaces by pencils and pigments (not chemicals!!!); Architecture, those of erecting edifices, ecclesiastical and secular; Sculpture, all methods of producing representations in relief. The manipulatory and mechanical details *may* be taught, but *that* which invests them with real beauty, grace, and power, as *works of art*, cannot be taught. The divine afflatus which animated some of "the simple great ones gone," and is shared to some extent by many of our own day in every walk of art, claims a higher origin.

Can photography be thus taught? Yes: the manipulatory and mechanical details of it, certainly;—*is* taught, daily, to hundreds of votaries, many of whom be-label themselves "artist" forthwith, even as there are many painters who practise painting, yet are not artists in any true sense of the term. All these have but entered the lists: the race has yet to be run. That sacred title which Raphael bore, and Michael Angelo, and Claude, and Cellini, and Phidias, and Flaxman, and a long line of honoured names, is much too lightly bandied about in our own day.

But why—we hear some diligent amateur or professional photographer exclaim—but why cannot I get landscapes and portraits like those of Bedford, Williams, and some others, if photography is only a mechanical art? I have practised the art as long—have the same mechanical means and appliances—have spared no expense, or labour, or pains, or study. If photography is only a mechanical art, why do not those who preside in the councils and societies—accomplished savans learned in all the theory of the art, profoundly versed in all the phenomena elicited, and the substances, organic and inorganic, mineral and vegetable, used in the various processes—why do not they excel all others in their pictures? How is it that so few photographic *pictures*, comparatively speaking, are to be seen in public or private? Their number bear no relative proportion to the quantity of apparatus manufactured during the last few years. Is it that they are buried in the portfolios of their producers, amateur and professional? Alas! we fear not. The answer is, they are generally only too ready to show them. We must confess it has been our lot to wade through numbers of such; and, humiliating though it be, must fain admit that but few reached above the line of hopeless mediocrity: fewer still were of a high class. It is but fair therefore to conclude that we are, through the medium of our exhibitions, familiar with the best; and it is well known that all our best amateurs do exhibit. If men whisper of manipulatory secrets and photographic tricks known only to the few, believe them not. The only secret resides in the personal qualities of the artists themselves, and they could not teach you those. It does not reside in knowledge, essential as it is—

"Let her know her place:
She is the second, not the first"—

nor in experience, essential as *that* is; for, after bestowing both, they could not make you see as they see, nor feel as they feel. You must bring even to the photographic landscape or subject as much as you take away; and in this sense it may be truly said—

"Minds that have nothing to confer
Find little to perceive."

It is that photography is *not* a mechanical art, though there is an element of that kind mixed up with photography; but is really only a new medium, and the latest, through which man can express his sense of the Beautiful, and the results vary as much as the individual minds through which they pass. Perhaps some of the opponents to its claims as a fine art would be surprised to learn that some of our best exhibitors could, if needs be, paint the scenes they depict with the camera—*have* drawn or painted them, and that with no 'prentice hand. They have chosen or adopted this medium, but are not exclusively tied to one. Photography, in the hands of a master, is an art inimitable in its way, and susceptible of infinite variety, and modulation, and power. It is not that there is anything in photography to prevent its becoming one of the most fascinating of the fine arts; but it is to be feared the artistic element has been too much neglected by its professors. Let there be fewer pictures, and let them be better studied, and the art would inevitably rise to a higher status. That it is too often degraded, and, in the hands of touters whose employers caricature humanity, has become somewhat of an abomination, is no more chargeable to photography proper, than that the paternity of the black profile tribe, and the perpetrators of vulgar daubs for publicans' back parlours, should be thrust upon the Royal Academy.

Even in its most mechanical aspect—namely, the power of infinite multiplication—it is less so than engraving; for every print obtained from the negative plate owes some of its beauty, or the want of it, to the hand that performs the task.

Another sure test of what may be considered a fine art resides in the consideration of what part of our nature it appeals to. A fine art appeals only to the finer part of our nature. All the lower arts minister only to the material or animal part of our economy. Does the photographic landscape, with its marvellous delicacy of detail and play of light and shade—does the really graceful and masterly portrait of the genuine artist, with its soul-speaking reality, appeal to our animal appetites or our material sense of comfort? To what does it speak? What feelings does it awaken? What thoughts does it excite? Are they not of a higher order? If it does not do any of these things, what does it do? To use the most threadbare of newspaper phrases—"we pause for a reply."

That which is the offspring of the higher part of our nature can minister only to those faculties, even as "that which comes from the heart goes to the heart." Away with all utilitarian cant! They have their uses too—every "thing of beauty" and work of art;—like the lilies of the field, which toil not, nor spin, yet are arrayed in a glory beside which that of the most magnificent monarchs pales its ineffectual fire. They serve to remind man whence he came—whither he goeth: to refine—to humanise—to elevate.

It would seem that, when the world is ripe for any particular means of enlarging man's nature, or hastening his progress, Providence ushers it in by some individual discovery—perhaps puts into one man the intellectual force of a number of men, or brings it about by the successive discoveries of several. Thus we had printing at the right moment, to supersede the slow and, necessarily to the many, unobtainable missal and manuscript. Now, in our own day, we have photography at the right moment; for there is no denying that, gigantic as we certainly are in science and learning, the majority are comparatively infants in art.

Photography places within the reach of the many what has hitherto been inaccessible to all but the wealthy few:—pure landscape, correct drawing, reproductions of the greatest pictorial efforts of human genius, the triumphs of constructive skill, and the boundless wonders of nature. To render thousands capable of thus more fully enjoying the contemplation of the marvellous works of the Creator—to enlarge the perception of the beautiful by educating and refining the taste, is to admit of a greater amount of pleasure being derived from a greater number of *pure* sources, while the number of those partaking of them is indefinitely multiplied. All art is elevating. The outward beauty of nature—

"A setting sun, a lake among the mountains"—

whether embodied in photograph, or drawing, or painting, is one more means of presenting moral beauty to the mind; and

"How near to good is what is fair."

In conclusion, let not any photographic neophyte be discouraged by the superior excellence of others; but rather rejoice and take comfort in the fact that there is in photography abundant scope for the exercise of individual taste and feeling. What the photography of the future will be, when we consider its progress in ten years, the boldest imagination cannot shadow forth.

If the recent mis-classification of photography be not simply an unintentional error, but an emanation from, and an illustration of, the same spirit of exclusiveness which animated the body who so long denied engraving admission to their ranks, we need but to observe that the day will certainly arrive when they will be proud and glad to admit it. It would surely be far better that they should not lose an opportunity of paying a graceful compliment while they yet may, than that they should with tardy justice do so when, as often with the individual honours they bestow, they can add no distinction—impart no lustre—and confer no honour.

ANOTHER "HALF BRICK"

From A Wall.

In another of our respected friend Mr. Punch's illustrations of the mining districts, the new clergyman, a mildly pleasant, affable man, anxious only to conciliate, remarks to one of the miners aforesaid that it is "a very fine day," and, receiving only a grunt by way of reply, repeats his observation, when he is startled by the abrupt growl of the miner, who says—"Did I say it warn't? Do you want to hargur, yer beggar?" I must say I no more expected your remarks than the clerical gentleman did the miner's, inasmuch as, writing in *defence* of "sharpness," I was somewhat startled at being accused of throwing "half bricks" at such a very desirable quality. But I fear you wanted to "hargur." So you see it was only because my meaning was a stranger to you that, like the Christian miner, you "heaved" half a brick thereat.

To explain. I *never* did heave any section of any existing brick at sharpness *rightly understood;* but I did, shall, and will heave, not only half, but whole bricks—not only whole bricks, but the biggest whole bricks within my reach—in fact, a whole *wall*—at certain qualities which, as I still assert, are very commonly recognised as belonging to that misused term, "sharpness."

You seem to have overlooked also a fact which I urged at the commencement of my paper, viz., that it was written by me, not as an optician, but as an artist and photographer—dealing, not with the means, but with the results; and judging a lens, not by optical theories, but by the character of its productions.

You denounce my want of scientific knowledge. When did I advance even the slightest claim to such knowledge? Mine is a profession greedy of a man's whole time and energies; and I, not being by any means, alas! one of its richest members, have been forced to yield up to it what in pseudo classical language we term "the entire animal." Moreover, if I possessed a deeper insight into the more subtle theories of science, it is very probable that I should not have that reputation as an art-teacher which you do me the honour to assert I possess.

I hoped my paper would elicit from those who pretend to greater scientific attainments than I possess so clear an exposition of "sharpness," as a scientific term, that future misconceptions of its meaning would be scarcely possible. I hoped to show that, while artists were right in denouncing flatness, hardness, and the want of atmosphere, neither artists nor photographers were right in supposing such qualities constituted "sharpness."

As to the title of my paper I give any one permission to call it what he pleases ("what's in a name?"); but I hope he will endeavour also to understand what it means before he undertakes to reply to its arguments.

Although I cannot pretend to be more in focus (or sharp) than other folk, I am as enthusiastic a lover of photography as most; and if I can only show artists that photographers differ from them rather in the use of certain terms than in more essential and important respects, and convince photographers that artists, in denouncing "sharpness," rather denounced qualities really untrue to nature and offensive to good taste, I don't care how many "bricks" I cast forth, how many "Wall papers" I produce, or how many adversaries I meet.

With reference to Mr. Robert Hunt's remarks, as I quoted them, without comment, merely to prove what was therein roundly and unmistakeably asserted, how on earth can it be said that, even by implication, I misinterpreted his meaning?

You also state that "it is a well-known axiom that the more intense the illumination the greater is the depth of shadow." In that case the weak but clearly defined shadows of strong sunlight ought to be absolutely of greater depth than the strong black shadows of weak moonlight. How is this?

ALFRED H. WALL.

THE MINER'S "GRUNT" IN RETURN.

Not so fast, good friend! You have seen pictures which were both sharp *and* hard. You have heard them bepraised for the former quality, and the latter has properly enough offended you; but we believe you have "saddled the wrong horse" with your animadversions. If the term "sharpness" has been misused, artists are the culprits. We deny altogether the existence of any misunderstanding of the term amongst optical men. We did not overlook the fact that you laid no claim to any scientific knowledge; for *our* Wall, like "a brick," makes no false pretensions; but he sometimes makes a mistake in fancying that men of science (like *some* artists) talk vaguely. There is not much "fancy" about figures, and mathematicians are rather too fond of "hard facts."

We had hoped that *your* hope had been fulfilled with regard to a clear exposition of "sharpness" in its optical sense, and we cordially agree in denouncing flatness, hardness, and absence of atmosphere; but the presence or absence of such qualities are not directly dependent upon sharpness *alone*. So please never denounce "sharpness" if you expect to make an impression. You know the sharper the blade the better it cuts.

Surely it is not singular that one who asks *what* sharpness is should misinterpret Mr. Robert Hunt's meaning; and, with regard to shadows, we must not confound transparency with weakness, and opacity with depth—a not uncommon mistake. The intensity of a light is always determinable by the intensity of the shadow which it casts—as we shall be most happy to demonstrate practically. Its transparency is quite another thing. But here again we fear that the language of science and art may not coincide, and a question of mere words and names is always unprofitable.

AN ALBUMEN PROCESS.

By James Larpey.

Any person trying the following (modification of the) albumen process, I believe, will no longer doubt the possibility of Mr. Negretti having produced his admirable stereo. transparencies by that method of working.

1. Coat the plates with any kind of collodion, iodised or uniodised (having plenty of it iodised, use it; but I doubt not plain collodion would do quite as well).

2. Wash well in ordinary water. I use a plate or dish and the tap. Drain, and

3. Pour on the albumen—

Iodide of ammonium	4 to 6 grains.
Bromide of potassium	1 „ 1½ „
Water	2 drachms.

Use the albumen as in the Fothergill process—first quantity to drive off the water, second quantity work well over the plate, and then drain it well and rear it up on one corner in a warm oven or over the gas to dry, and it is ready (or can be put aside till wanted) for excitation.

4. Excite in bath—

Nitrate of silver	60 grains.
Acetic acid	60 minims.
Water	1 ounce.

And wash thoroughly—you cannot wash too much—and rear up to dry in the dark. It can now be kept five hours, days, or months, till required.

5. Exposure about double the time of wet collodion—say, landscape lens, fifteen inches focus, full sunshine, about two minutes to five.

6. Developer.—Saturated solution gallic acid and a few drops of nitrate of silver, fifty grains, and one ounce water. By varying the quantity of nitrate any kind of tone can be got. A small quantity gives brown—more, black tones.

7. Wash.—Fix and wash, and the pictures cannot be told from plain, pure, and simple albumen ones.

Now for its advantages.—It possesses the peculiar beauties of plain albumen, without any of its necessary difficulties of preparation. The collodion coating enables you to pour on the albumen without trouble, and to dry immediately, without drying-box or fear of dust. It keeps admirably—in fact, apparently as long as albumen. It works much quicker than plain albumen, and beautifully clean. It can be developed as soon as taken, or deferred till next week or month; and, when fixed and washed, is as

firm as any varnished pictures can be, and so adhesive that you can hardly tell which side of the glass it is upon. Considering its ease of preparation and certainty of action, I believe it will stand second to none for dry purposes or copying transparencies. May I ask, as a favour, that you will, if possible, devote a small portion of your time to giving it a few trials, and then if (as I believe you must) you find it promising, give the world the benefit of your experience.

[The experience of the author of the preceding corroborates the assertion of M. Taupenôt with regard to the use of collodion that is uniodised. As already stated, we neither have nor had any doubt about the integrity of Mr. Negretti's process, as given by him.—Ed.]

RE-DISCOVERIES IN PHOTOGRAPHY.

In a paper, by Mr. Taylor, of Edinburgh, *On the Magic Lantern*, which appeared in the last number of your Journal, there is at least one topic which is highly suggestive, and which, in the retirement of a temporary residence in the country, I will now endeavour still further to elucidate, premising that if in doing so I should happen to come somewhat roughly across the fingers of Mr. Taylor and some other members of the Photographic Society of Scotland, yet that such flagellation is administered with regret that there should be occasion for it, as well as in hopes that it will be beneficial in its results to the above-named Society in particular and to *inventors* in general.

I select as the foundation of my remarks, at present, that portion of the paper in which Mr. Taylor denounces the thievery in photographic inventions and discoveries so rife at the present day. Very well, I say: it is quite right such conduct should be denounced, for *re*-invention is the prevailing sin of the photographic age. But such denunciation must come from some other person than a Scotchman, especially a citizen of Edinburgh, more especially still a member of the Photographic Society of Scotland; for it is a fact that this Society, of which Mr. Taylor is Secretary,* has made itself perfectly notorious for its patronage of second-hand discoveries. This is certainly a grave charge against any Society, no matter how inefficient it may be; but proofs so abundant may be found that in the present case the difficulty is in the selection. In this article I will go no farther than the proofs Mr. Taylor has unwittingly furnished to us himself. It seems then that, some time ago, the ability to keep collodionised plates *dry* in a state of sensitiveness was a desideratum. The first to step forward to the relief of the tourist was Mr. Shadbolt (you yourself, Mr. Editor), who by means of a solution of honey in water enabled us to varnish our films in such a way that after exposure the plates could be developed. The only objection to this was the fact of the plates not being quite dry, and hence liable to damage if they were kept in a place to which dust had access. In giving an account of this new process, on July 6th, 1854, Mr. Shadbolt having stated his reasons for employing saccharine preparations, says:—"loaf sugar, moist sugar, grape sugar, sugar of milk, mannite, and honey, together with glycerine, have all been employed by me," &c., &c.

The principle, then, of "The Honey Process" (as it was called for many years) is, that a saccharine preparation applied to the plate will not allow the film to dry into the hard and impermeable condition it otherwise would have done. Bearing this in mind, we now pass on to the next and, at present, the final stage of progress. Dr. Hill Norris, in the course of his investigations, found that the conditions for preserving a collodion plate sensitive were, that the pores of the collodion be filled up by any substance which, no matter how hard and horny when dry, should be softened by water, so as to allow of the action of a fluid developer, and also that the surface of the film should, by the same varnish, be protected from atmospheric influences. This principle was established and published in May, 1856; and, later in the same year, he, in a communication to the *Journal of the Photographic Society*, as correctly quoted by Mr. Taylor, says he had used for the purpose albumen, gum, dextrine, starch, caseine, tanno-gelatine, and a great variety of similar substances. Now, all these things were well known to Mr. Taylor and the members of the Photographic Society of Scotland, seeing they were published in the before-named journal, which, according to Mr. Taylor, is the organ of that Society; and, in saying that, he inadvertently lifted a stone to throw at the head of the Society, to which operation I shall immediately proceed.

In April, 1857, Mr. John Sang, a member of the Photographic Society of Scotland, *discovered* that golden syrup would preserve a plate. Well, so did Mr. Shadbolt in 1854, and published it, too, at that time.

In the end of 1857, Sir David Brewster, president of the society in question, read to the members an account of a "new" photographic process, communicated to him by a Frenchman. In this, the preservative varnish was *dextrine*.

In January, 1860, Dr. Robert Paterson read before the same Society an account of a new dry collodion process, in which the preservative varnish consisted of a solution of *gum arabic*.

But for Mr. John Macnair seems to have been reserved the high honour of enlightening the Council of that learned and intelligent Society with light of such intensity as to have blinded its members up to the present time. At the close of Dr. Paterson's paper, as above quoted (I extract my information from the official report of the transactions on that occasion), Mr. Macnair gave to the Society his *discovery* that brewers' wort, or infusion of malt, would act as a varnish for preserving the sensitiveness of collodion plates, alleging his experiments to have been made *in conjunction with* Mr. J. T. Taylor. This important discovery (!) was thought of such importance by the Council that the only bronze medal it had ever deemed it necessary to award for inventions or discoveries in the art was given to Mr. Macnair for his communication. Now that this *invention* was a plot between these two gentlemen to test the gullibility of the Council there can be no reasonable doubt; and that the Council fell before the stumbling-block is now on record. Before Mr. Macnair made known to the Society his remarkable discovery, it had *previously* been brought before the notice of the Society at least *three* times. In the first place, in 1855, deeming it an improvement on the original communication of Mr. Shadbolt, a London gentleman—"I. J. H."—published it as a process well worth a trial; and this publication took place in the *Journal of the Photographic Society*, which, according to Mr. Taylor, is the organ of the Photographic Society of Scotland. In the second place, Mr. Taylor himself, in a paper read before the same Society, on January 7, 1859, alludes to it as a well-known *existing* process. Stranger still, we have, one year later, Dr. Paterson, in a paper read before that Society, alluding to it as an *existing process*. And, to crown all, Dr. Paterson no sooner sits down than Mr. Macnair rises and gives it forth, for the first time, as a "new discovery!"

The density of the fog into which the Council of that excellent Society has been betrayed, may be learned from the fact that not only did it award Mr. Macnair the medal for *his* important invention, but also that, in its last Report, some members, feeling they had committed themselves, endeavoured to justify their proceedings by saying it was the best process yet discovered!!!

Mr. Taylor will therefore see that some of his late sneers against Englishmen might be more judiciously expended a little nearer home.

PETER SMITH.

Cornwall, June 26, 1861.

[Though not disposed to deny the general accuracy of the facts adduced by the author of the preceding, we cannot concur in imputing to many worthy gentlemen bad motives, nor consider them guilty of any greater crime than is committed by our present contributor, viz., carelessness and inadvertence—*e. g.*, the misapprehension of Mr. J. T. Taylor's position in the Society named, and who, by the way, we *know* to be animated by an unusual amount of zeal for the progress of our art.—Ed.]

[* Our contributor is in error here. That gentleman, although, we believe, a *member* of the Photographic Society of Scotland, is Secretary, not of it, but of the *Edinburgh* Photographic Society—quite a distinct Society, though meeting in the same town.—Ed.]

ON FILTERING COLLODION.*

By M. Mc-A. Gaudin.

Homogenousness of collodion is a quality of the first importance. Many photographers are accustomed to clear the collodion solely by letting it stand some time, and afterwards pouring it gently off. The manufacturers of chemical products, who operate upon large quantities, act in the same way; but, as I have already said, a simple collodion appearing clear can become, after its ioduration, filled with imperceptible spots—spots that one must not confound with the less numerous and brilliant points which show themselves upon the shadows: these points proceed from quite another cause. Having had the misfortune to fall upon a collodion of a gelatinous nature, notwithstanding repeated filtering through cotton I could never avoid the spots: at last I resolved to filter through paper, and this time the film was perfectly exempt from spots.

For many years I had renounced the filtration of collodion through paper, having rarely succeeded in effecting it without difficulty. The cause of my non-success was very simple: I used a filter with channelled sides, hoping to filter more quickly, and never thought of using a filter simply folded in four. But with the filter

* From *La Lumiere*.

with exposed sides the collodion dries on the exterior, and soon ceases to pass; whilst with a filter folded in four, which adapts itself automatically to the funnel, the vaporisation of the alcoholised ether can no longer occur, and the filtration is quicker. By means of a last filtration with paper, a quite recently-prepared collodion at once presents a perfect homogenity; whilst that simply poured off and filtered through cotton would not answer.

Thus the use of a filtering paper folded in four instead of with little folds solves perfectly the problem of filtering collodion; and, without doubt, one would succeed equally with albumen.

The filtering with paper ought to have been preceded by a filtration through cotton. The funnel ought always to be kept covered with glass, and from time to time a little ether added to compensate for the evaporation.

This will suffice for the preparation of bottles of three to four ounces; but to filter several quarts at once, another arrangement must be made. Procure from a tinman a zinc cylinder of from two and a-half to three inches in diameter by four inches high (being able to put it in a preserving pot), with a rim, in order to rest it upon the neck of the preserving pot, the zinc cylinder being perforated at the bottom like that of a coffee pot. Upon the bottom put a disc of metallic cloth, and the interior should be covered carefully with a sheet of filtering paper, without any cementing material, and reaching to the edges. Upon the mouth of the cylinder place a glass funnel, having in it a tuft of cotton slightly compressed, and upon which empty the iodised collodion, and cover the funnel immediately with a glass. By this means two or three quarts of collodion may be filtered in less than one hour; and, *before using it*, one may filter again with a funnel and a filter folded in four to fill the bottle for use. The strong filtering paper which is sold cut into discs of different sizes is excellent for this purpose.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. VI.

Entrance into Jerusalem—Hotels—First Sabbath—The English Church—Syrian Houses.

The end of my last article left me approaching Jerusalem. I had just caught a glimpse of it, and was revelling in the sacred associations and memories it brought up, when I was, as I thought, rudely disturbed by the sudden appearance of two young men, who each saluted me, and presented, or rather tried to present, papers for my perusal, which I learned were certificates from former travellers of the superior character of the accommodation at the hotels at which they were waiters, and on whose behalf they now appeared as "touters." I was scarcely pleased at being disturbed *then* with this question; and, besides, I never could bring myself to be over courteous to touters anywhere. So I believe I very distinctly and summarily dismissed the representatives of the two leading hotels in the Holy City by informing them that my mind was unalterably made up to go to the *other house*—which it certainly was not till just then—a resolution which I nevertheless carried out, and never had reason to regret.

The view of Jerusalem from the Jaffa road has few points of attraction; and as I shall have opportunity soon of fully describing the appearance of the city from the various commanding heights with which it is surrounded, I may as well chat with my reader about the hotels as we walk our horses at a leisurely pace up to the Jaffa Gate, through which I purpose to enter the City of our Lord.

Till a few years ago all visitors to the Holy Land had to live in the convents of the different sects of Christians; and many travellers still prefer them to the hotels which are to be found in most of the larger cities. Some Protestant Christians I believe felt it disagreeable to do so, and called loudly on the missionaries and consuls of Protestant countries to use their influence to get hotels opened in as many of the cities of Terra Sancta as possible. These have met with a measure of success, and wherever tried they have been able to remain in existence. In 1860 there were three hotels in Jerusalem kept by members of the English Church there. The one I had chosen is the smallest—scarcely aspires indeed to the dignity of a hotel, but may be called a boarding-house. It is in the Turkish quarter, and overlooks the Via Dolorosa, and has to a photographer an invaluable quality—an inexhaustible supply of fine water. It is kept by Max Unger, a converted Jew, an honest and simple-minded man, whose attentive and accommodating disposition will make him a favourite with all who visit his house. The other two I had good means of knowing are good and comfortable houses. That of Simeon Rosenthal is on Zion, near the Jaffa Gate, and commands a fine view of the City. The usual system of charging is the same at all—so much per day for everything, including food and lodging.

Having got my cavalcade within the walls of the city I dismounted, and guided by Mr. Max Unger I was soon inside one of the clean and comfortable rooms of his house, disencumbering myself of the now useless defensive gear, six-barrel revolvers, &c., which I am glad to say I never required during my journey, but for *show*, though, as will be seen by-and-by, I was unfortunate enough to be in that country during the whole of the terrible massacres which horrified Christendom last year, and which furnished the *pretext* for the presence of a division of Napoleon's army in that *un*governed country.

After I had seen my baggage all safely placed, and had eaten my first meal in the Holy City, I was soon ready and willing to enter on my *first sleep* too, and a pretty long one it was. Had any one told me that I should go to sleep in an hour after I entered Jerusalem, and not rush up to the Mount of Olives the first morning at early dawn, but would lie peacefully unconscious of where I was, dreaming of far-distant scenes of loved friends in the old country and of dear ones gone to the better land—weaving of memory's woof a fabric of bright and gladsome hues—I would not have believed him. Late in the morning when my servant called me I found I had little time left, so I had to get ready as fast as possible and go to church service at half-past ten, and leave all sight-seeing till another time, if not to another day. Yet what could be a more fitting employment of my first hours there than to join in worshipping God on the summit of Zion?

The Anglican church I found to be a substantial Gothic building, inside of which was assembled a large and respectable congregation. It was pleasant to hear the full-toned organ pealing forth its notes of praise; and my readers will appreciate the peculiar feelings with which one joined in singing the psalms of the "sweet singer of Israel" on the very spot where he had chaunted them three thousand years ago. The Rev. Mr. Crawford—an accomplished and scholarly man, of whose genial and kindly disposition I can speak highly—preached on this occasion; and I regretted that his failing health precluded me from again enjoying the same advantage.

On the conclusion of the service I returned to the hotel, guided by Mr. Max, through the narrow streets, among the medley of loitering passengers, laden camels, donkeys, &c.; for there is little of what we would call Sabbath appearance in the streets of Jerusalem on the Lord's Day. There are three *holy* days observed here:—Friday is the Moslem Sabbath: it makes least appearance. Saturday is the Sabbath of the Jews, and is, perhaps, as evidently a day of rest as any of the three. And Sunday, the first day of the week, is of course the Sabbath of all Christians.

After dinner I went out for a walk outside the walls. I soon found that my dragoman had but a very limited knowledge of the topography of the city and its environs, but that he had the rare quality of knowing how little he knew, and was consequently unwilling to move far from the Jaffa Gate. I knew the city was something like square, and that there was at least a gate on each side; so I thought I would walk round to the Damascus Gate, and, perhaps, if I could make my way to the gate opposite the one I had emerged from the city to the St. Stephen's Gate, I would thus get a sight of Mount Olivet. I did so; but by the time I got so far as to be able to see the sacred height well, it was approaching sunset. Philip reminded me that the gate would be shut then, and that if I did not make haste I would be locked out. There was so much to be seen I thought it cruel to be so hurried; but true enough the time of gate-shutting did approach, for as we spoke a soldier appeared on a slight elevation which hid from my view the yet open gate, and in a wailing tone called out, in Arabic, that he was just "going to shut the door." Philip rather unwillingly entered; for he wanted to retrace his steps to the Jaffa Gate, from which it afterwards turned out he could alone make his way to the hotel. He told me nothing of that till he had me in a labyrinth of narrow dirty streets. On we wandered, but seemed to make little progress. Unfortunately I had, as yet, no knowledge of the streets, and positively did not know where my temporary domicile was. Philip, however, remembered that it was near the Russian Consulate; and, as the flag of the Czars floated over it, he and I soon caught sight of that representation of Muscovite majesty, and so got out of the difficulty.

On Monday morning, as early as I thought it advisable, I went out to deliver the notes of introduction I had brought to the Consul, the Bishop, and most of the missionaries. At the Consulate I met a Jew resident who had for some time practised as a professional photographer. He took a pretty fair picture, and had done a considerable

number of views; and, had he been as frank and reliable as I could have wished—and I may say as I might have expected from his extraordinary professions of universal benevolence and earnest desire for my welfare and success in particular—he might have given me some valuable information regarding the peculiarities of working in that country, the best views, best points, and the time to take them, &c., &c. But, as it was, I soon found that he was a Jew in the worst sense we are accustomed to use that word.

After leaving the Consulate I returned to my hotel for the purpose of sensitising a few plates, that I might expose them in the afternoon. In most cases it would have been a wiser course to wait till I had seen the city from various points, and had fixed on the best views, and how many I could afford to take. I was, however, in a hurry; and as I had seen one really good view, it mattered little to me if there were ever so many as good, or better: I could not be far wrong in securing it.

I have previously promised to give you some description of the peculiarities of the Syrian houses. I may as well do so before I enter upon my photographic preparations. And in doing so I may make my Jerusalem hotel a model as far as it can fairly be esteemed to be so. The houses in Palestine are built of stone, and have a decidedly substantial appearance. Very little wood is used in the construction of them. Many parts that with us in so-called stone-and-lime built houses are of wood are there of stone and lime, or of *stone* or *lime* alone. There are no wooden floors; nor any joisting or wooden beams or girders; nor any wood in the construction of the roofs. Neither are there any cupels or wood lining, and there are no slates. These are a few negations. The walls are generally very thick, and of stone and lime. The roofs are of the same material, the ceiling of each room being *arched*, and of solid masonry of great thickness. If there be more than one flat, the floors and ceilings are formed in the same manner.

Instead of wooden, or tile, or stone, or earth floors—being all the kinds I had ever seen before—the most usual Syrian floor is of lime; a fine cement, spread as smoothly as possible, and having a polish and closeness of grain like fine marble.

In Jerusalem the roofs of the houses are not quite flat, but in the main are so. The central part of the arched ceiling of the rooms is carried up, and has a dome-like appearance on the outside. If the rooms be large and of an oblong form, there are generally two or more of these domes. The general effect of them in the views of the city is very pleasing. The great intensity of the light enables the people to do with small windows, and very few of them; and the Orientals having a dislike to the faces of their wives or daughters being seen, it leads them further in the same direction. There are generally not any, or very few, windows toward the public thoroughfares. An ordinary *plan* of building a house of some size, such as an effendi (a gentleman) would build, is something like this:—A dead wall is run up towards the street. It is pierced by only one opening, which is the main entrance or front door. On opening it the visitor finds himself in a paved court, of a nearly quadrangular form. The various rooms of the house are on three sides of this square: all the windows and doors are towards it. To these rules there are many exceptions, and especially the inner courts are of very various forms; but in all native houses the *idea* of construction is the same. Max's hotel is situated on a steep slope. There are two flats: the upper flat is the principal one, and the floors of it are level with the street, to which the house fronts. The lower flat may be esteemed a kind of area flat: the rooms of it have no openings whatever but to the central court; in fact the earth is not taken away from the other side. Native houses never have any chimney or other provision for fires in their rooms; and yet they have some cold weather every winter: this winter, for example, in Jerusalem, they had a severe snowstorm. The native population ignore such facts, and, I was told, sit and shiver through the cold weather. Personally I am fond of the sight of an open fire, even in pretty warm weather, in this country; while, on the contrary, in Syria I never missed it. There is no damp air, nor damp place to warm or dry, and the temperature was *never* below a point which was quite agreeable; but by-and-by my readers will be able to judge how much higher it was than most of them would esteem so.

The outline I have given of the general *plan* of the buildings is rather against the application of much architectural decoration—the front of the houses being properly *within* the property, the part which faces the street offers few points for the application of ornament. The buildings are generally plain. "Oriental magnificence" is certainly not to be found in the exterior of the private dwellings, if indeed it ever existed anywhere but in the pages of poets and romancist travellers and historians.

The interiors of the rooms are generally also plain. The walls are whitewashed, and remain long of a snowlike whiteness. The bright polished cement floors are here and there covered by brilliant-coloured small carpets, on which the people squat down in their own peculiar fashion. This sitting on the floor leads to the making of many elevations in a room, to suit the varied social standing of the occupants.

The interior furnishing of the houses occupied by western residents in Jerusalem is generally as near to the style which prevails in the country to which the proprietor belongs as can be obtained: I need not, therefore, further describe the inside of Max's hotel.

Having arranged with Mr. Max to use one of the suite of rooms I had engaged as an operating-room, I set to work to darken it as efficiently as I could; and here I may remark that my sympathies are completely with Mr. Thomas in the *spirit* of his directions on this point. I have always been intensely anxious to avoid the possibility of any white light in my operating-rooms or camera. For dry-plate photography such precaution is peculiarly necessary, and in the East I found it no easy matter to keep it out from either. The difficulty of making a room sufficiently dark, indeed, and the uncomfortable feeling one had in being so closed up, led me almost invariably to prefer working at night, when doors and windows could be open.

Exhibition.

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[COMMUNICATED.]

ALTHOUGH the arrangements of the Society have been somewhat retarded from causes beyond immediate control, the Exhibition has, since our last notice, been generally completed and thrown open to the public. Delays have taken place in forwarding the pictures, and several spaces which were applied for have not yet been filled up; but the Committee, having a large amount of available space at disposal, has determined to make the requisite arrangements from time to time for fresh contributions rather than postpone longer the preparation of the catalogue.

This Society having offered two medals for the best productions of the solar camera, have received in competition twenty-two pictures, coloured and plain, one of the latter, however, being worthless; but none are fair exponents of the capabilities of the camera. Of these, the specimens by Mr. John Turner, of Stafford Street, Birmingham, a member of the Society, claims the first attention, it being a coloured portrait of the late Rev. John Angell James, a gentleman not only well known and valued in the town, but generally esteemed throughout the country during a long career of usefulness. The picture is half-length life-size, the pose easy, and the facial expression natural and full of character. The painting is well executed; and, from a comparison with an untouched duplicate, on double-elephant drawing-paper, which accompanies it, according to the regulations (but which, being a waste copy, has not been hung), great credit is due to the artist for the manner in which he has retained the characteristic expression of the photograph. No price has been attached to this picture; but it ought to find a ready purchaser. A second picture, painted in oil, is also exhibited by Mr. Turner; but it is not in any way comparable with the one just noticed. The uncoloured copy is flat, and the artist has also failed in producing the effect of roundness in the features. Mr. Turner has two other uncoloured pictures—one particularly noticeable, from its peculiar flatness and want of half-tone; the other, a vignetted head, life-size, with plenty of half-tone, but somewhat hard, and both of an unpleasantly greenish hue, apparently due to over-development: this is much to be regretted, as it gives the subjects a death-like appearance, which a warmer tone would have removed.

Mr. Pickering, of Birmingham, contributes three solar pictures, none of which call for particular comment. One is a half-length portrait, painted in oil; one a bust of a child, in water colours; and the other a bust, in crayon. Not being accompanied by plain copies as required, we could not judge of the capabilities of the photographs apart from the artistic merits. The half-length, though not striking, is carefully painted; the child crude and inharmonious in colouring; and the bust in crayon reminds us very much, from its tone and the peculiar antique-looking dress, of an old engraving.

Messrs. Smyth and Blanchard, of London, have forwarded six pictures, two of which—the vignetted portraits, about half life-size, of a lady and gentleman—are very fine productions, of a warm,

pleasant tint, and full of half-tone. Two life-size busts are vigorous in execution, and would form excellent studies for an artist, but are cold in tone; and we were rather surprised to find so little care had been bestowed upon them, as they have been sent without glazing, and the otherwise good effect is materially destroyed by the warping of the mounts. Of the remaining prints, we must characterise one as decidedly bad, and, like the two preceding ones, is unglazed; the other, though not equally bad, is hard and flat: the tone of both is cold and unpleasing.

From the three life-size vignetted portraits by Mr. Atkinson, of Liverpool, of which we cannot say a word of praise, the whole being flat and hard, we turn with pleasure to the four productions of Mr. Angel, of Exeter. Unlike all the others, which are plain developed prints, those of Mr. Angel are on albumenised paper, and toned with gold. With one exception, they exhibit more artistic feeling than any other solar picture exhibited. An enlarged full-length group of two young ladies, in walking-dress, is the most satisfactory; the pose is easy and graceful, the drapery clear and distinctly rendered and full of half-tone, and the whole gives evidence of careful study. With a few skilful touches from the hands of an artist such a picture would, as a portrait, be almost faultless. In contradistinction to this group is a male portrait, about half life-size, exceedingly vigorous in its treatment, and a good study, but completely marred, as an artistic production, by an ugly perpendicular excrescence in the form of the chair back, which seems to have no connexion whatever with the subject, and puzzles the spectator as to what it can possibly be. The two remaining pictures exhibited by Mr. Angel—a full-length group of children, and a vignetted half life-size portrait of a female—are good as photographs, the latter particularly so; but the group, as in the former instance, would have shown better had it been touched or coloured, as thereby a slight tendency to mistiness about the features would have been removed. We are disposed to consider the pictures of Mr. Angel as generally preferable to those of Messrs. Smyth and Blanchard, as they bear the impress of more studied and artistic feeling.

Though too late for competition for the medals, we would throw out the hint to the owners of solar cameras that it would be advisable to send specimens of their productions to the Exhibition. It is the first time that they have been brought collectively before the public, and by comparison with the works of others the relative capabilities of each one would be rendered more apparent; and as the last year was so unfavourable for the use of the camera, and the notice given by the Society so brief, we are disposed to think the pictures exhibited are not a fair test of what can be done. We should be glad to see the display in this branch of the art strengthened by an increased number of prints.

Before entering upon the departments of landscape and portraiture, we cannot refrain from adverting to the wonderful instantaneous stereographic transparencies of Mr. Breese, of Birmingham, an amateur member of the Society. They form a distinctive feature in the Exhibition, not only from their great excellence, but as being the only stereographs exhibited. It is also the first time the public have had an opportunity of inspecting these exquisite productions, as they have hitherto been entirely confined to a few personal friends. In stereographic photography Mr. Breese seems equally fortunate with all classes of subjects:—sunlit pictures—dashing waterfalls—cool majestic ruins—animated life—the onward career of the express train—or the calm quiet of the moon, and that luminary, too, when under the influence of an eclipse, with only a small portion of her orb visible—are all truthfully rendered, and with the greatest delicacy of gradation. One of the most strikingly beautiful of the eighteen slides exhibited is a group of objects arranged on a white marble chimney-piece, with a mirror as a background. It consists of a chased silver flagon, a parian statuette under a glass shade, a cut glass jug and lustre, a glass of water, and two pearl shells. To render the texture of the various substances forming this group, together with the reflected lights, consequent upon the arrangement, and from a window which is faithfully delineated by reflection upon the silver, most photographers would shrink from; but this has been accomplished by Mr. Breese in a manner at once startlingly real and beautiful, and not the slightest doubt can be entertained as to the nature of the different materials. But by far the most marvellous are the moonlight scenes, of which three are exhibited—one the full moon in the midst of, and just breaking through, a mass of clouds, illuminating their prominent edges, and, as it were, tipping them with silver; another, the reflection of the moonbeams upon the waves of the sea, presenting so marked a difference from the rays of the sun, as shown in a similar slide of *Sunrise*, from the same point, and *Moonlight Meditation*, a female figure contemplating the full moon through an open window. This slide, we believe, is printed from two negatives taken immediately succeeding each other; but this does not detract from the merits of the picture. One arm of the lady, covered with a white lace sleeve, rests upon the polished surface of a table under the window; and, though the figure of the lady is little more than defined, the reflected lights upon the table and lacework of the sleeve is finely rendered. Another charming production is *Powerscourt Waterfall*, County Wicklow, presenting, by its peculiarly real and silvery appearance, a marked contrast to the stereographic waterfalls we are in the habit of seeing. The transparent fluidity of running water is also very faithfully rendered in the *View of Fountains Abbey*. Each stone of this grand old ruin is in Mr. Breese's hands clothed with that exquisite gradation of tone which time alone imparts, and which with the wonderful atmospheric effect, together with the most magnificent of natural skies, serve to render this one of the most delicately exquisite productions of its class we have yet seen. The view of *The Crystal Palace*, from the Anerley Road, is another one which we should fail in attempting to describe: the atmospheric effect is most marvellous, and the distance rendered as we could only believe it to be by nature. In other views the fancy of Mr. Breese has revelled in storm clouds and storms—the waves in some cases lashed into foam, or calming down after their passing fury, as in *Kingstown Harbour*, a storm clearing off, or a *Calm Sea off Llandudno*. On the occasion of the visit of Her Majesty to Birmingham, to inaugurate the opening of the Hall in which this Exhibition is held, Mr. Breese took four pictures of the streets adjoining the Town Hall, which are now exhibited, and form with the general public one of the chief sources of delight. They represent, first, the order maintained by the officials immediately prior to Her Majesty coming in sight; second, the arrival at the Town Hall; third, the departure of Her Majesty from the Hall; and fourth, the appearance of the streets after the departure: the crowds have cleared away, and one solitary omnibus alone represents the animation of the town. Copies of these pictures were forwarded at the time to Her Majesty, who was graciously pleased to acknowledge their great excellence.

If on no other account, photographers are deeply indebted to the Birmingham Society, and also to Mr. Breese, for the exhibition of these transparencies, which we are certainly surprised should have remained so long publicly unknown. We believe Mr. Breese has been induced by his friends to print copies for sale: an opportunity will thus be afforded to those interested in our beautiful art, and having the means at their disposal, of possessing themselves of some at least of these truly exquisite productions.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The last monthly meeting of this Society for the session was held on Thursday evening, the 20th ult., in St. Peter's School Rooms, Walworth,—the Rev. F. F. Statham, President, in the chair.

The minutes of the last meeting having been read and confirmed,

The President rose and congratulated the members present upon the satisfactory state of the Society generally. There had been an increase of members, and indications of vitality exhibited which were very gratifying.

The Secretary (Mr. A. H. Wall), in laying the reports of the past session before the meeting, stated that the officers and committee took credit to themselves for the able and interesting papers, nineteen in all, which they had by their exertions been the means of placing before the Society; and thanked the writers of those papers in the name of the Society. Their best thanks were also due to the contributors to the portfolio of the Society, and to Mr. Davis for his contributions to their library. They desired further to express their acknowledgments to Mr. Sebastian Davis, Mr. Walker, Mr. Hannaford, Mr. Wall, &c.

Mr. Howard (the Treasurer) then read the annual report of the Society in detail, from which it appeared that the number of members had been increased to 45. He also announced a deficiency of £3 some odd shillings, arising from incidental expenses for which they had no surplus fund—various stock articles having been purchased. The *soirée* cost but £3 3s., the rest being defrayed by voluntary contributions.

SECOND ANNUAL REPORT.

In resigning the trust you placed in their hands, the Committee must proffer their congratulations upon the continued advancement of the Society in public estimation, the steadily progressive increase in the number of members, the number and importance of the papers which have been introduced, and the practical, animated, and *harmonious* character of the discussions.

Nineteen papers have been read at our meetings, in which the scientific, artistic, mechanical, and manipulatory elements of photography have each received attention, as will be seen by the following list of their subjects:—

On the Adaptation of Portrait Lenses to Views. By C. Jabez Hughes.
On an Improved Portable Camera. By G. W. Simpson.

On the Photogenic Action of Colour. By T. Clarke.
On Instantaneons and Composition Photography. By S. Fry.
On Positive Pictures on Glass. By A. Hervé.
On Some Optical Principles Involved in the Construction of Photographic Lenses. By W. Ackland, V.P.
Hints on Keeping and Composition Printing. By A. H. Wall, Hon. Sec.
Art Photography: its Scope and Characteristics. By C. Jabez Hughes.
On Photography in Connexion with Astronomy, Meteorology, and Magnetism. By T. Burr, F.R.A.S.
On the Practical Details of the Fothergill Process. By F. Howard, Hon. Treas.
On Photography for Wood Engraving. By J. Contençin.
On a Visit to the Photographic Department of the Greenwich Observatory. By G. W. Simpson.
On Intensifying Processes as Adjuncts to Instantaneous Photography. By V. Blanchard.
On the Stereotrope. By T. Clarke.
On the Solar Camera. By S. Smith.
On Sharpness. By A. H. Wall.
And the *First, Second, and Third Reports of the Experimental Committee.*

The Committee take credit to themselves and the Society for having recognised the importance of photography as a department of imitative art, to which the principles and rules of pictorial science are as applicable as to painting and its kindred branches. The best thanks of the Society are due to its very excellent and rev. President for regular and constant attendance at its meetings, and for the efficient character of his services as Chairman during the session.

The Committee have to thank the authors of papers read at the meetings for their able contributions, and the kind interest they have thus displayed in the Society's well-being and utility.

The thanks of the Society are also due to Messrs. Hughes, Meagher, Davis, Simpson, Leake, and others, for the exhibition of apparatus, &c.; to Messrs. Bayley, Fitch, Blanchard, Smith, Simpson, Joubert, Davis, Wall, and others, for kindly contributing to the folio; and to Messrs. Simpson and Davis for gifts to the Society's library.

In the Society's first annual report several suggestions were thrown out, some of which have been successfully adopted, while others yet remain dormant. Among these the sub-committee appointed for testing and reporting upon new or modifications of old processes, and prosecuting experiments in furtherance of fresh discoveries, has been very happily carried out. The out-door meetings then suggested have also been adopted with general satisfaction to the members.

The Committee cannot permit this opportunity to pass without recording their grateful thanks to the following gentlemen, viz., G. Wharton Simpson, Sebastian Davis, C. Jabez Hughes, Borchert, and M. Hannaford, for their punctual and regular attendance, and their generous and valuable labours as members of the above sub-committee.

In entering upon the new year your Committee would suggest that the Society enter upon a new condition of existence for the following reasons:—

When the subscriptions of members have been used for the expenses incurred by the Society for the Journal and the presentation print, it is found that the trifling balance remaining is not sufficient for the incidental expenses of warming and lighting the rooms, correspondence, &c.; and that any thought of devoting small sums to the prosecution of experiments, or to other steps in connexion with the advancement of the art, and, consequently, of the Society, would have to be completely abandoned.

To meet the above difficulty two paths were open. In the one the subscriptions could be raised to a guinea per year, or an entrance fee, such as is usual in similar associations, be established; in the other the Journal might be abandoned, and one subscription of half-a-guinea be adopted, the Society pledging itself either to spend more money on the presentation photographs, or to increase the number of such, so as to secure two or more per year for each member.

Thinking the latter the better plan, your Committee recommend its adoption.

Another consideration in connexion with the supply of a Journal was that, in undertaking such distribution to members the Society rendered itself responsible for the subscriptions of such, although the Committee could not always rely upon the receipt of the same from *all* the members. For instance, in several cases last year's subscription remains unpaid up to the present time; and in one case the Journal has been supplied to a member for the two past years of the Society's existence whose subscriptions, after repeated applications, also remain unpaid.

Influenced by the above, and thinking it wrong that the Society should be in debt to its officers, your Committee was contemplating the discontinuance of the Journal when an event occurred which helped them very summarily to a conclusion.

The Publisher and Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, placing an interpretation upon the connexion existing between it and the Society never directly or indirectly accepted by your Committee, and claiming certain exclusive privileges tending to cripple the independence of the Society and retard its influence in propagating and advancing the art, such claims were not admitted; and an engagement made for a term with the Publisher was, in consequence, by him abruptly broken, although the Committee, resolving that their engagement to the members should be more justly carried out, procured the Journals at an increased rate of charge, and forwarded them post free as usual.

In consequence of this misunderstanding, the hitherto pleasant connexion between this Society and THE BRITISH JOURNAL OF PHOTOGRAPHY has ceased. We can no longer be regarded as associated in any way with the trade interests of any particular periodical, and each member may select for himself such journal as best pleases his own taste or judgment; while, by supplying at least two presentation prints per year, and rendering the Society even more actively useful in new departments, we must endeavour to fully compensate our members for what might otherwise be regarded as a something lost. We trust, therefore, that the support the Society has hitherto received, and we may fairly say *deserved* also, will not be withheld, and that the conduct of the Committee in supporting the proper dignity of their position will give satisfaction both to the members and the friends of the Society.

The Committee, moreover, recommend that, instead of one, three Vice-Presidents be appointed; and that, in addition to Mr. W. Ackland, our present vice-president,* they have received permission from Mr. Sebastian Davis and the editor of the *Photographic News*, Mr. G. W. Simpson, to nominate them for election—a step which we are sure will be thoroughly appreciated by the members generally, and do honour to the Society.

The Committee recommend that the following gentlemen be elected to serve on the Committee of the next year:—

Messrs. Hannaford, Fry, Borchert, Blanchard, Quentery, Leake, and Foxlee.

And that the Secretary and Treasurer be re-elected.

Also, that the following gentlemen be elected as members of the Experimental Sub-Committee:—

M. Hannaford.	Sebastian Davis.	F. Howard.
G. W. Simpson.	M. Borchert.	W. Ackland.
C. Jabez Hughes.	Samuel Fry.	

It is usual to wind up annual reports with a glance at the progress made by the art during the Society's year. This need not, however, prove a very tedious task, inasmuch as the fact is that no very prominent discoveries or other important features have marked the history of photography since our last annual meeting. The vexed question of government competition with photographers had its day, and seems likely to give place to a scheme for organising an association which, if successful, will compete with the professional photographer through the aid of amateurs more effectually, perhaps, than even the Government grant enables the South Kensington Photographic Department to do—the leisure of wealth, and the skill of labourers independent of their hire, who are satisfied with any remuneration which will pay even for the bare material, being rather formidable antagonists to that other labourer whose work buys *daily bread as well as the bare materials.*

Some promising steps have been taken in the adaptation of artifical light to photographic purposes. A good many firm-placed steps have indicated progress in an artistic direction. Modifications of more or less value in existing processes have been brought forward. Photolithography and photozincography have moved towards perfection.

Panoramic photography now appears to have made a fresh start. It is to be regretted that too many of our best and most artistic photographers—forgetting that upon such expositions the public estimation of their art is founded—sent nothing to the Photographic Exhibition of London, which was not, in consequence, so fair an exponent of progress, especially artistic progress, as it might have been. The Architectural Photographic Exhibition was a very excellent one; and of this, we are happy to add, no such remark as the above could be made. A new process, which will enable us to dispense with a sensitising bath, has been announced as an idea conceived by Captain Dixon, and worked out by a member of this Society, Mr. Fry. Several other gentlemen, however, have laid claim to the idea, Mr. Bellini having previously announced the same in the *Photographic News.*

In conclusion, the Committee feel it their duty to proffer some remarks in connexion with the position photography will probably hold in the Great International Exhibition of 1862. This grievance is too well known to be here repeated; but every photographic society in the kingdom ought certainly to combine in suggesting, discussing, and preparing for such steps as may most vigorously oppose and defeat the foolish, unjust, and mischievous intention announced by Her Majesty's Commissioners of classifying pictures produced by optical and chemical science and artistic talent under the head of—heaven save the mark!—MACHINERY!!!

The following are the modified rules proposed for adoption:—

1. That this Society be called "THE SOUTH LONDON PHOTOGRAPHIC SOCIETY."
2. That this Society hold its meetings on the second Thursday of every month, to read papers upon photography in any of its various departments and discuss the same, to prosecute experiments, exhibit apparatus and specimens, &c.
3. That nine in-door meetings be held from October to June inclusive, and that out-door meetings, as may be appointed by the Committee, be held during the three intervening months.
4. That the number of members be unlimited, and that all candidates for admission be nominated by one member, seconded by another, and elected by show of hands.
5. That ladies be eligible to become members.
6. That every member be privileged to introduce a friend at the monthly meetings.
7. That the subscription be half-a-guinea per annum, *payable in advance*, and a payment of five guineas in one sum constitute a life member.
8. That the Committee be empowered to arrange soirées, conversazionés, and exhibitions of photographs, appoint sub-committees for conducting any particular series of experiments, &c., as the Society's funds may permit.
9. That no member be deprived of his privileges unless by a vote of three-fourths of a special meeting.
10. That the annual subscription be due upon the second Thursday in June, at which meeting officers are to be elected for the ensuing year.
11. That the management of the Society be conducted by a President, three Vice-Presidents, Secretary, Treasurer, and a Committee of eight—four to form a quorum.
12. That a full report of the Society's affairs be laid before the members at the annual meeting.
13. That the Secretary have the power of convening a special meeting on receipt of a requisition signed by half-a-dozen members.
14. That no alteration be made in these rules except at the annual meeting in June, or at a special meeting convened for such purpose.

The SECRETARY, in reference to the discontinuance of the distribution of the Journal among the members, said that the members individually could buy any journal they pleased: it would not increase their expenses greatly, and, if they chose, they could jointly themselves make a contract with some journal for the whole number required, which would be more economical.

The CHAIRMAN thought it very undesirable that the Society should start afresh with a balance against them. If each member could contribute something, as the amount was so insignificant, it would at once supply the deficiency.

Mr. HOWARD wished to guard them against any impression that the Society was in difficulties: it was a contingency only. If they preferred it, there would be probably some outstanding subscriptions got in, and with the increase of means at his disposal he would confidently undertake to get the Society out of debt during the ensuing year. The members present must decide which course they would adopt.

It was decided that a subscription list should be sent round the room, after which the Chairman announced that the greater part of the deficiency had been made up.

The report and accounts, which had been examined by two responsible persons, together with the new rules, then received the sanction of the members present, and the following officers for the ensuing year were elected:—

President.—Rev. F. F. Statham, B.A., F.G.S.

Vice-Presidents.—Messrs. Sebastian Davis, G. W. Simpson, and C. Jabez Hughes.

Hon.-Secretary.—Mr. A. H. Wall, 11, The Terrace, Walworth.

Hon.-Treasurer.—Mr. F. Howard, 12, Whittingham Villas, Studley Road, Stockwell.

Committee.—Messrs. Hannaford, Fry, Leake, Clark, Fitch, Quentery, Borchert, and Foxlee.

Mr. Sebastian Davis permitted himself to be nominated chairman of the Experimental Committee.

The CHAIRMAN again rose to call the attention of the meeting to the *vexata quæstio* of the position assigned by her Majesty's Commissioners to photographs in the forthcoming Exhibition in 1862, and read the letter addressed to them by Dr. Diamond, the secretary of the parent society. He then referred to the correspondence which had ensued, not forgetting the admirable letter of Professor Playfair, and thought that as all present were, doubtless, familiar with the letters, they would not inflict upon him the task of reading them. Perhaps he had better read the final unsatisfactory reply of the Commissioners, in which they clearly assumed—what was not at all clear to others—that a Committee would be appointed.

* The Secretary was only informed at the last moment that Mr. Ackland desired to be released from the duties of his office.

Mr. Wall, after reading a portion of the correspondence already given in our columns, then made some remarks on the subject. He said that the question to which their attention was called appeared to be somewhat complicated. That photographers who lived by their profession *would* exhibit their works at the forthcoming National Exhibition could not be doubted. Applications for space had been already made, and preparations were being carried on for such purpose by most of the best men. Photographic Societies were powerless to prevent that; and, as a matter of business alone, it was too important to professional men for them to expect that they would neglect their own personal interests for the sake of advancing their art in public estimation. Nor, it might be reasoned, while the absence of photographic productions would not tend to remedy the mischievous tendency of the strange arrangement of Her Majesty's Commissioners, the presence of first-class photographic pictures would certainly tend to show the world how little the art deserved the degradation it had been forced to submit to. From one of the letters he had read it would be perceived that certain concessions had been made, inasmuch as they found it was stated that there was nothing to prevent photography being placed in a separate room, or in juxtaposition with engravings, or any other analogous and suitable class of objects. To such an arrangement there could not be any very great objection he should think. But next came the great bugbear and difficulty. The Commissioners seemed willing to give the halfpence solicited, but photographers must also take the kicks which accompanied them. In other words, photography must not claim a more important position than that accorded to its apparatus. Well, what was to be done, or, rather, what *could* be done? If the Council of the Photographic Society refused to appoint a Committee to look after the interests of the art, and see that it was fairly represented by the productions exhibited, it was not at all unlikely that a crowd of photographs would appear in the Great Exhibition of next year which would *really* be more fairly the productions of lenses and cameras than heads and hands; and the art, in consequence, might receive so serious a blow that its advancement in public estimation, and its consequent progress as a branch of pictorial art, would be thrown back for very many years to come. The occasion was, indeed, a most important one, and the Society would not do its duty if it did not receive serious consideration. He therefore called upon the gentlemen present to give them such aid in drawing up a reply to Dr. Diamond's letter as might enable them to represent well and truly the opinions of the members generally in reference to the matter in dispute. He would be very sorry to see their beautiful art degraded to the level of machinery and apparatus—just as sorry to see it unrepresented next year—and still more sorry if it should be unfairly represented. However, he did think that by appointing the Committee requested by Her Majesty's Commissioners the Photographic Society would be in a better position to urge and enforce the claims of the art. They should at the same time at least protest against the former as being perfectly undeserved. Before concluding, he would just add that photographs were not yet strong enough, *as works of art*, to compete with the professional painter, or first-class engraver; and that would only be made too apparent to those who would overlook the infantine condition of the art, and the want of art-education in the photographer, and saddle all faults of the individual on the back of photography. Of course, there were many photographs—he was proud and happy to say, *very many*—which as pictures even could not be surpassed by the productions of any artist; but these were rather the exceptions than the rule at present, although they had excellent indications in the present condition of artistic photography from which to augur "a good time coming."

Mr. Sebastian Davis: Although cordially agreeing with the general protest that has arisen from the photographic world against the attempt to lower the position of its artistic productions from their rank as works of art, I must at the same time call attention to the necessity of recognising the distinct interest attached to many pictures intended solely to illustrate the principles involved in their production. It is in consequence of overlooking this distinction that many persons are apt to pronounce an unjust sentence upon the artistic capabilities of photography, and to pass a deprecatory estimate upon the art itself. They disregard the fact that a photograph may possess an intrinsic value, apart from any pretentions to pictorial excellence. It frequently happens, moreover, that the photographer is called upon to delineate objects of great interest with an accuracy and fidelity at variance with the exercise of artistic skill. The representation, for instance, of an event of public importance—the opening of any national building, the arrangements for carrying out any great engineering project, the registration of meteorological or electrical changes—would be most valuable acquisitions as a permanent record of a passing event, without necessarily having any pretensions to rank as a work of art. But, although wanting in the latter respect, such a record could not justly be regarded as the mere offspring of mechanical arrangements, nor as devoid of the power of awakening intellectual pleasure. To promote, therefore, a correct appreciation of the full scope of powers of photography in the public mind, I advocate the recognition and classification of photography generally under the two distinct heads of "Art Photography," and "General or Applied Photography." It appears to me that, by impressing the public mind with an understanding of the existence of this twofold feature of our science, art photographs would be estimated according to their intrinsic value as works of art, and that this estimation would act as a stimulant to make them increasingly more so. General or applied photography would then, upon the other hand be valued as possessing merits peculiar to itself, and be regarded in the special character of its capacity of contributing to the promotion of scientific, typographical, or industrial advancement. The estimation of a photograph, even in the latter point of view, has no right to be reckoned as a mere mechanical performance: it is a scientific production, dependent for its existence upon the discoveries that have arisen from the exercise of mathematical, optical, and philosophical skill. By conceding that such productions should be distinguished from art photographs, we by no means admit that we lower their dignity: the principles of their production bespeak the language of poetical beauty, inasmuch as they consist in the adaptation of the force existing in a ray of light to pourtray the object or scene from which it has been reflected. The twin sisters, science and art, undoubtedly coalesce together in nearer harmony in the productions of photographic results than in the kindred works of painting, engraving, or sculpture. Whilst, therefore, supporting Mr. Simpson's resolution, and feeling that art photographs are works of art, I at the same time would by no means undervalue the power of photography with respect to the importance of its non-artistic applications, or admit that its results are obtained by mechanical, instead of by chemical, optical, and scientific means.

Mr. Wall, though approving of Mr. Davis's distinction, did not think he had sufficiently appreciated the position and power of photography in certain walks of art. It would be for the committee of the Photographic Society to arrange how they would place the art productions and the scientific applications.

The Chairman did not think Mr. Davis had done so, but simply wanted to show them that there were two classes of photographic "results."

Mr. Davis confirmed what he had said by an illustration drawn from the last Exhibition.

The Chairman thought the question just mooted was one of classification between art photographs and photographs of geological specimens, anatomical preparations, and so on.

Mr. Simpson observed that that would be the work of a committee, and was a matter of detail. The real question at issue was the treating of photography as a mechanical art.

The Chairman said that, though deprecating the course taken by the Commissioners, he thought it would be unwise to resent it by not exhibiting.

Some members admitted that they did not intend to do so, and that they had applied for space.

Mr. Wall hoped that English photography would not be partially, and therefore *unfairly*, represented.

The Chairman thought the public would confer their homage. Let photographers send their very best, although protesting against the indignity offered them.

The letter of reply to the London Photographic Society was then read.

Mr. Simpson suggested that this was a time when all should concur in strengthening the hands of the parent society. He begged to move the following resolution:—

"That this meeting expresses its hearty concurrence in the steps already taken by the Photographic Society of London towards rescuing photography as an art from the degrading position in which it is placed in the proposed classification of Her Majesty's Commissioners for the International Exhibition, 1862, and desires to thank the Council of that Society for thus endeavouring to maintain the dignity of our art; and that this Society desires further to express a hope that, if it should be eventually deemed prudent, in lieu of any more satisfactory arrangement for apparatus and pictures offered by Her Majesty's Commissioners, that such department be accepted under a protest against any classification in the catalogue of the International Exhibition which does not recognise photography as one of the fine arts."

Mr. Wall thought there never was a time when the interests of photography required to be guarded with greater vigilance and activity, and seconded Mr. Simpson's resolution with great pleasure.

The Chairman then put the resolution to the meeting, which was immediately passed.

The evening of meeting was altered from the third to the second Thursday in the month.

A vote of thanks was unanimously awarded to the treasurer and secretary—Mr. Howard and Mr. Wall.

Mr. Wall, in returning thanks, proposed a hearty vote of thanks to the Rev. President for his great attention and constant attendance, which was enthusiastically responded to.

The Chairman, in reminding the members of the annual out-door gatherings, wished for some expression of opinion as to the locality for the first excursion, at the same time suggesting Richmond. Other places were suggested, and, after some desultory conversation, Bennington Park, West Croydon, was decided on,—the members to meet at West Croydon station at 3 p.m. on the second Saturday in July, if fine; if otherwise, on the following Saturday.

The Secretary then announced some important and interesting papers for next session, and the meeting terminated.

CHORLTON PHOTOGRAPHIC SOCIETY.

The meeting of this Society took place on Thursday, the 13th ult.

The President (Mr. J. Heywood), in opening the business, said:—Gentlemen, it may, perhaps, be desirable, at the opening of this meeting,

that I should say a few words to you on the occasion of the re-forming of the Chorlton Society. That Society, as you are all aware, was formally dissolved at the last annual meeting. Many of its members, however, wishing the social connexion to continue, have decided to re-establish the Society on a firmer basis. At a recent preliminary meeting they did me the honour of electing me as President. I should have been glad to have seen some one of greater photographic attainments, and possessing in a greater degree the ability to fulfil the duties of the office, in that position. I would much rather have retired altogether. However, as it appears to be your desire that I should still be prominent among you, I cheerfully accept the distinction, and you may rely on my best endeavours in the cause; but I must confess to a feeling that my assistance will not be of much greater value than it hitherto has been. As there is, no doubt, business to be brought before you, I will not occupy more of your time than is necessary to indicate what, in my opinion, is the best and most agreeable means of accomplishing the objects which, as a Society, we have in view—namely, the spread of photographic knowledge, in its various branches, among ourselves and others. This can be done, to a considerable extent, by the reading of papers on the particular method that each of us is in the habit of working. I must not be understood to imply that papers have not been read and discussed, nor that the most minute particulars have not been given; but, generally, we have found that more sterling information has been elicited in conversation, and when members have inquired for the information they specially needed. I think we should cultivate this kind of conversational meeting. It takes a little from the formal character of the proceedings; but it removes all stiffness, and every one feels at home.

Another pleasant and instructive way to knowledge is the formation and carrying out of photographic pic-nics—if not for taking specimens, yet for selecting sites, and the pleasure of a country ramble. I cannot conceive anything that is more agreeable than to stray into the country, admiring the works of Nature as they appear when stern winter has departed. To how many healthy rambles can we all look back where the pleasure has been enhanced by the conversation of a friend whose pursuits were similar to our own? Mrs. Barbauld's simple tale of "Eyes and No Eyes," published in *Evenings at Home*, and familiar to every school-boy, well illustrates how some persons can find beauties where others can find none. With those who can find none a country ramble is not unfrequently tedious; and it is, I think, really worth the while of such persons to acquire the relish for Nature's charms: and to this end photography is a valuable help.

I remember, whilst listening, some years ago, to a talented performer playing on one of the finest organs in this country, asking a not musically inclined friend, who did not seem to share in my intense enjoyment of the treat, what he thought of the performance. His reply threw over me a feeling that I will not attempt to describe—"I would rather have a score of oysters!" Now how different would it have been had I met with a response that accorded with my own feelings!

An undoubted advantage is to be obtained from a comparison of the pictures we produce, good or bad. The practice is to bring our best specimens for exhibition, or for admiration, as the case may be. I think we should do better in bringing our failures, so as, if possible, to arrive at the cause of failure, and thus know what to avoid in future.

Positives on glass scarcely come within the range of subjects from which to expect much benefit, however useful they may be as remembrancers; and whatever emotions they may occasion in some persons, they are not quite the class of subject that should take up too much of our time here. I do not wish to condemn them, nor yet to disparage them, as far as they go; but still I am of opinion that we should look more to our improvement in landscape photography as offering more scope for intellectual study and benefit.

On looking back to the records of the late Society, you must certainly admit that very few specimens have been brought by the members for exhibition. With few exceptions I might almost say the year was blank. The special exhibition with the lanthorn was beyond doubt a great success, and was not without its meed of good. We should profit by a recollection of the past; and, if a repetition of such evenings be considered desirable, by all means let us have more of them. We can improve our taste and judgment by comparison: let us therefore adopt it, and latent talent may be found and developed where it may be supposed to have had no existence. Let not the hundreds of pictures remain in our boxes and drawers, shut out from mortal gaze; but let them be brought here for our common instruction and pleasure, and thus the Chorlton Photographic Society may aid the onward progress of the art.

At the conclusion of the address,

Mr. Griffiths opened a discussion on the alkaline gold toning process, by asking if any member present had had any experience in toning by means of phosphate of soda and gold? and if so, what was the quality of the result, as compared with that obtained by carbonate of soda and gold?

Mr. Rogerson, in reply, said he was in the habit of using the phosphate of soda and gold toning bath, and was satisfied with the results obtained. He would, however, caution those who might try this method that it was necessary to slightly over-print, inasmuch as the proofs were liable to become reduced in toning and fixing, which does not occur to the same extent when carbonate of soda is employed instead of the phosphate. In preparing the toning bath he said it was of importance to neutralise the chloride of gold, if acid, by the addition of a sufficient quantity of carbonate of soda, in solution, before mixing with the phosphate of soda.

Mr. Wardley fully concurred in the opinion of Mr. Rogerson that for general work the phosphate was superior to the carbonate of soda, its only drawback being the necessity for over-printing.

A Member said he should be glad to know if others, in common with himself, had found any difficulty in toning some samples of albumenised paper, as he had lately met with some that resisted all his efforts?

Mr. Wardley thought it was generally injudicious to employ old paper. He had ample proof that good paper, if kept too long, became deteriorated in toning qualities. He remembered trying a sample, some time ago, that yielded a satisfactory result when new, but which, after a few months' keeping, was all but useless, as he could not then produce results at all approaching those obtained on the same paper when new. As a general rule, he did not like paper more than than three months' old. He could recommend Papier Rive, when free from specks—a blemish he had found it sometimes to contain.

Mr. Griffiths said that the cause of deterioration in positive paper offered a fair subject for inquiry, and he hoped to see it entered into with spirit.

Mr. Whaite believed that exposure to light and air was the chief cause of change; for he had observed that paper (more especially drawing paper) changed in colour if long exposed to these influences. The method he was in the habit of employing for the preservation of paper was to keep it under pressure, and exposed as little as possible to light and air; and suggested that photographers would do well in adopting a similar plan with their positive papers.

Mr. Griffiths thought the change which occurred in plain paper might be owing to the nature of the size employed in its manufacture; resinous soap (a substance peculiarly liable to change when under atmospheric influence) generally forming one of the components of size for paper.

Mr. Radcliffe could support this view, as he had lately made an experiment by soaking some paper in common turpentine (which always contains more or less resin); and, after drying in the dark, and exposing under a negative, traces of a picture were visible.

Mr. Rogerson had frequently observed similar changes in newly-cut wood. He had seen a deal board planed and left partially covered. After a short time the uncovered portion had perceptibly darkened.

A discussion then arose on the permanency of prints and the amount of washing required to ensure permanency. The general idea was that the prolonged water-washing recommended by some was quite useless, and did not seem to improve the keeping qualities of photographic prints.

The President said he could furnish the result of some experiments in that direction.

After a long and interesting conversation on the best mode of mounting prints, Mr. Wardley promised a paper *On the Manipulation of the Collodio-Albumen Process.*

Mr. Knott exhibited a positive paper print, which, for artistic arrangement and beauty of detail, was pronounced quite a *chef d'œuvre.*

After the usual vote of thanks to the Chairman, the meeting adjourned.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A special general meeting of the members of this Society, to which the public were admitted, was held in their rooms at the Oddfellows' Hall, Temple Street, Birmingham, on Tuesday evening, the 25th ult., to consider the position which has been assigned to the art of photography in the Exhibition of 1862, and to arrange for a memorial and to determine as to the course which, in the opinion of the Society, ought under the circumstances to be pursued. Mr. W. B. Osborne, Vice-President, took the chair, and there was a very fair attendance.

The Secretary read the circular convening the meeting, and the correspondence that had taken place between the Council of the Photographic Society of London and the Commissioners of the International Exhibition of 1862, as to the position assigned by them to the art of photography in their regulations.

The Chairman, who briefly opened the discussion, contended that a painting and a photograph were equally the result of the genius of the artist, as exhibited through the instrumentality of such tools as might be placed in his way, whether it was by the colours, brushes, and mahl stick in the one case, or by the lens, camera, and chemicals in the other; and, that this being so, they ought to be placed on an equal footing in the International Exhibition.

Several other gentlemen spoke to the same effect, after which

Mr. Brown, Hon.-Sec., proposed—"That this meeting is of opinion that the classification of photography by the Commissioners in their programme of regulations for the proposed International Exhibition of 1862 is both unfair, discourteous, and unjust; and, while they highly approve of the steps taken by the Council of the London Photographic Society, and the arguments used by it in the endeavour to induce the Commissioners to amend the said classification, would urge upon all photographers the necessity of refraining from exhibiting their productions, or in any way taking part in the Exhibition, until a more fair and equitable position is assigned to photography as an art; and while this meeting cannot but deeply regret the course the Commissioners have taken, they would cordially join the Council of the London Society in presenting a memorial to the Commissioners upon the subject, or in any other course the Council may deem it desirable to adopt."

The resolution was seconded by Mr. C. L. Haines, and was put and carried unanimously.

Mr. Turner then briefly proposed—"That the most cordial thanks of this meeting be conveyed to the Council of the London Society for the praiseworthy position they have assumed in upholding the present important interests of the art of photography."

Mr. Burr seconded the motion, which was carried *nem. con.*

After the usual vote of thanks to the Chairman, the meeting terminated.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

This Society held a special meeting on the evening of the 20th ult., in its usual place of meeting,—Mr. A. Mactear in the chair.

The Secretary intimated that the meeting had been specially called for the purpose of considering a circular and relative documents which he had received from Dr. Diamond, the Secretary of the Photographic Society of London, regarding the position which the Commissioners propose to assign to photography in the International Exhibition of 1862. These documents were held as read,—members being in possession of their contents through the columns of The British Journal of Photography.

On the suggestion of Mr. Douglas, the letter of Dr. Lyon Playfair was read by the Secretary.

Several of the members present expressed their opinions on the question; all, however, fully concurring in condemning the doings of the Commissioners.

Resolutions were then passed, homologating the past acts of the Council of the Photographic Society of London; and the Secretary was instructed to write to the Secretary of that Society, thanking the Council of the Society for what they had done, and assuring them that the City of Glasgow and West of Scotland Photographic Society joined in the strongest remonstrance they could send forth against the *absurd, inconvenient,* and *unjustifiable* arrangement proposed by the Commissioners.

After the above business was disposed of, the arrangements for the first excursion of the Society were laid before the meeting, and were approved of.

Mr. A. Robertson then brought under the notice of the Society an article in *Photographic Notes* for June 15th, from which, *inter alia,* it appeared that Mr. Sutton was under the impression that the Society had appointed Mr. Hugh Macfarlane to try lenses.

The Secretary was instructed to inform Mr. Sutton that the Society had not appointed any Lens Committee, nor had they had the question of appointing one before them at any time.

Several members expressed their wish for an opportunity of giving an opinion on the questions raised by Mr. Sutton and Mr. Ross, but time would not then permit them to do so fully and fairly to all parties. It was therefore considered advisable by the members to confine themselves for the present to a simple denial that that Society, as such, had any connexion with Mr. Macfarlane's trial of lenses.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of the above Society was held on Friday, the 7th ult. Mr. G. C. Warren, Vice-President, occupied the chair.

The Chairman said a circular had been received from the Manchester Photographic Society relative to the forthcoming Photographic Exhibition to be held in that city during the Meeting of the British Association in September. He (the Chairman) hoped that the members of this Society would lend their aid to their Manchester brethren. He then drew attention to various prints from the negatives by Moule's photogen, which had been exhibited at the previous meeting.

Mr. Laws read a paper *On Transparencies,* from which we make a short extract. After some general observations on other modes of producing transparencies, Mr. Laws gave his own method, as follows:—

"The camera I use consists of a long dark box, with a partition from end to end. In the centre I have two quarter-plate lenses; at the extreme end I have a groove for receiving the negative; at the other end I insert my prepared plate. I fix the camera upon a stand, and point it towards the sky (northward is best), using very small stops. In this way I get a transparency equal to the negative in sharpness. I should have stated that the camera is made in two portions, one sliding within the other. Having placed the lenses at the proper distance from the negative, which entirely depends upon their focal length, the image becomes sharp upon the ground glass by sliding the camera out and in. When once sharp, no more focussing is required. I then prepare a plate, in the same manner as for a negative, by the usual wet process, and expose in the camera. The exposure, of course, depends upon the light, and the density of the negative. Negatives full of detail, and with little density, give the best proofs. I develop with pyro.-acid, acidified with citric acid, in the usual quantities. When everything is in good working order, fine rich blacks can be obtained without adding any silver to the developer, which ought always to be avoided as much as possible. By placing the negative upside down, with the film outwards, the transparency is taken correctly for the stereoscope, without cutting the negatives. The camera I have described can only be used for negatives taken with the lenses two and a-half inches apart. When they are more open, they must be copied with one lens in a camera, with the slide made to shift, so that only one-half of the plate is exposed at once. In a good light there is no inconvenience in this plan; but when the light is bad, it is very awkward, the last half of the plate requiring more exposure than the first. The specimens I have brought are backed with opal, which I like very much; but it is rather more expensive than ground glass."

After some discussion on the above subject,

Mr. Warren gave the details of a plan which he used with success to prevent the film of collodion from splitting off the glass during the drying of the negative. Whenever the film showed the slightest tendency to split, he floated the plate instantly with alcohol. The water being thus driven out of the film, the varnish was allowed to be poured on. He stated that the occasional drying dead of the varnish, in consequence of the moisture, was not material. He had by this means been successful in saving many negatives that he would otherwise have lost.

Mr. North promised to read a paper *On the Construction of Glass Houses, with especial reference to the Arrangement of Light,* at the following meeting of the Society, on Friday, the 5th July.

The meeting concluded with a vote of thanks to the Chairman.

At a special meeting of the Council of this Society, held on the 18th ult., Mr. G. E. Warren in the chair, a communication from Dr. Diamond, relative to the position proposed to be assigned to photography at the Great Exhibition in 1862, was read. Resolutions were passed approving of the steps the London Photographic Society had taken; protesting against the classification of the Commissioners; recommending that no photographic works be exhibited; and according their warmest thanks to the Council of the London Photographic Society for the prompt measures they had taken.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on Wednesday the 19th ult. George H. Slight, Esq., Vice-President, occupied the chair.

The following gentlemen were ballotted for and admitted as members:—Ernest Ford, Ferneyside House; James A. Marr and William B. Marr, Brandon Street; Robert Darling Kerr, St. Leonard's House; Duncan Anderson, Holyrood Palace; D. R. Smith, Richmond Place; Wm. Wason, Rector of Robertson's Academy; and—Musgrave, South Charlotte Street.

The Secretary presented the Society, in the name of Mr. Alexander Taylor, Dunfermline, with the first donation to the Society's album. This consisted of a set of photographs from engravings of Noel Paton's pictures of *The Dowie Dens o' Yarrow.* These were much admired; and the Secretary was instructed to tender the thanks of the Society to Mr. A. Taylor.

A lengthened conversation took place on the subject of photographic excursions by the members to objects of interest in the locality; but as the subject was only of *local* interest, our correspondent has omitted further mention of the matter in this report.

The Secretary then read the correspondence concerning the International Exhibition of 1862. This correspondence appeared in our last number. Several members expressed themselves in strong terms against the degrading position which the Commissioners had assigned to the photographic art; and it was remitted to the Council to draw up a remonstrance against such intention. It was the unanimous feeling of those members present that, under existing circumstances, no photographers should forward to that Exhibition any specimen of their art.

A paper by Mr. John Traill, *On the Waxed-Paper Process,* was then read. [See page 233.] Various members made remarks on this subject; and the thanks of the meeting were awarded to the author of the paper.

The business for the succeeding meeting was intimated to be a paper *On Positive Printing,* by Mr. R. S. Galloway.

After a vote of thanks to the Chairman, the meeting separated.

The Italian Government has lately sent an order to England for a complete outfit for a Photographic Department that is to be established under the new auspices. Mr. Dallmeyer has made the lenses, which consist of two triple achromatic combinations and a portrait combination. The largest triplet, having a diameter of 6½ inches aperture, covers with the greatest perfection a surface of 30 by 24 inches; the smaller triplet, having a diameter of 4 inches, covers a field of 15 by 12 inches. The portrait lens, having a diameter of 4½ inches, is intended for plates 10 by 8 inches. The cameras for these lenses have been made by Messrs. Ottewill and Co. The largest is a monster, in three panelled compartments, made in mahogany, of dimensions proportioned to the largest triplet, and has a focussing range, adjustable by an endless screw, of from 25 to 100 inches. This camera is mounted on a solid rectangular framed stand, that runs on iron wheels; it works upon a rotating fulcrum, fixed in the centre of the stand, and is elevated and depressed by screws placed at each end of the framework. The camera for the smaller triplet and portrait combination is bellows-bodied, and is also adjustable by a fine screw motion, having a focussing range from 15 to 55 inches. Each camera is furnished with baths, glass trays, pressure-frames, and other accessory apparatus. A very large developing tray has been made, "according to order," of well-seasoned wood, lined with gutta-percha; but, although every care has been taken to clamp the gutta-percha lining to the base board by passing pellets of that material into conical apertures cut into the thickness of the wood, and then melting them so as to fill the holes, we question, from our own experience of large trays thus made, whether it will stand the climate, for we have found that as soon as the sun's rays fall upon the gutta-percha lining, or that it is affected by summer heats, it rises into great blebs that are quite irremovable by any after treatment; and these have such power, when forming, that the lining either separates from the plugs, or pulls them forcibly through the conical holes in the base-board o the sink.—S. H.

Notes of the Month.

That erratic luminary which is said never to set on Her Majesty's dominions, but is certainly too often obscured for the disciples of the heliographic art—breaking through all the monotony of official routine without the slightest compunction, or even so much as despatching a note to warn us of his intended "absence from business"—is now shining on both sides of the hedge at his maximum of intensity, tempting the laziest into the field, intent and earnest upon *doing* something.

Our greatest master in landscape and architectural subjects is about to gratify the admirers of Welsh scenery with a second edition of his *Beauties of Wales*—in which will be included, beside new ones of North Wales, a series of the whole of South Wales—and has just left town for a protracted course of labour, extending over a period of several months. Mr. Bedford has, this time, discarded his tent and its *impedementa* for the more commodious and ever-ready travelling carriage. A clarence, fitted up by Ottewill and Co., has been arranged on the principle embodied in Goldsmith's description of something that was

> ——— "made a double debt to pay,
> A bed by night, a chest of drawers by day."

In appearance, when *en route*, there is nothing to indicate the purpose to which it is devoted, save and except a suspicious-looking japanned tin despatch box on the roof; which is *not* a despatch box, but a *water-tank* and reservoir, or "camel of the desert," communicating with the *interior* by means of a gutta-percha tube, with tap appended. On either side of the near half of the interior of the carriage is what appears at first sight a kind of yellow glass panelling, where padding is usually seen. These, when the metamorphosis is about to be effected, open like cupboard doors, revealing unsuspected rows of bottles, measures, &c., on neat shelves, and these ingeniously folding *back* against the usual front windows (being themselves of yellow glass), and black shutters being drawn up at the *side* windows of the doors, a dark chamber is at once formed. A brass handle of what might be supposed a drawer pulls out from under the coachman's seat what proves to be a gutta-percha sink, *with* which the tank communicates, and *from* which the waste is carried away by another gutta-percha pipe under the bottom of the carriage. The bath is suspended permanently to the inside of one of the doors. Numerous other receptacles and lockers are formed under the seats and cushions for the stowage of plate-boxes, lenses, and all the thousand-and-one things which a landscape photographer may at any moment have occasion to call into requisition. Let us wish carriage and occupants *un bon voyage*. The walls of the next Exhibition will, doubtless, show good results; but we will not anticipate.

"Sweets to the sweet!" Coals to Newcastle!! Instantaneous views of Paris from London to Paris!!! The Stereoscopic Company are supplying French houses with the instantaneous pictures, on which they have two artists engaged there. Some twelve others are in the field, but (with the exception of Ferrier and Soulier), so far, unsuccessfully. The rage for *cartes de visite* is still unabated. We have just seen a very characteristic one of the author of *Tom Brown's School Days*, by the Stereoscopic Company.

For the lovers of the marvellous, but who have not the nerve for it, Messrs. Negretti and Zambra's instantaneous stereograph of Blondin performing his perilous exploit will suffice. We know of few better illustrations of the marvels of science than the manner in which such a scene as that of Blondin suspended in mid-air can be brought home to all those who cannot, whether from disinclination or distance, witness this extraordinary feat. To the placards on every wall, "Have you seen Blondin?" we can answer, "Yes! in the stereoscope—the nearest point of view we desire!"

The second of Mayall's *really* untouched series of portraits of distinguished men bears out the prestige raised by the first. The accessories are perfectly simple and natural. Lord Brougham's little kinsman, who is to inherit his honours—and the twain are said to be *inseparable*, being scarcely ever to be seen apart—is introduced, and appears to be imbibing a practical lesson in Social Science. The extreme contrast of age and childhood is impressive and instructive.

In answer to the appeal from the Council of the Photographic Society, already nearly all the photographic societies have "pronounced" on the degradation sought to be placed on photography at the Exhibition of 1862. Each society has protested against the resolution of the Royal Commissioners, and "passive resistance" appears to be the course recommended to be adopted by the followers of our art.

S. T.

Foreign Correspondence.

Paris, June 26th, 1861.

If very cold weather acts unfavourably upon photographic preparations and gives rise to a multitude of difficulties which the operator has great trouble in mastering, extreme heat is not less troublesome. For the last fortnight we have had an almost tropical temperature; and on all sides I hear nothing but complaints and outcries against the weather. It is the collodion which is decomposing, or the baths which are losing their properties, &c., &c. To these conditions of temperature and season is probably to be attributed the penury in communications which marked the last meeting of the French Society of Photography, which was held on Friday, the 21st. Among the letters read by the Secretary I have scarcely to mention any, except one from M. Cordier, in which is a modification of the process of printing upon albuminised paper, which has given him, he says, good results. He coagulates the albumen by dipping the paper into alcohol, and he sensitises in a five-per-cent. silver bath. Some one near me asserted that this system must have a deleterious effect upon the bath, to which it would give a red tinge. I give you the proposition and the objection for what they are worth.

Count Schouwaloff, a clever Russian amateur, wrote that he had obtained direct carbon prints upon paper. His formula is the same as that given by M. Fargier, as far as concerns the gelatine and the bichromate of potash, only he doubles the quantity of black. Instead of spreading the film upon glass, he spreads it upon paper. He exposes the back of the sheet, so that the light passes through its substance and prints upon the inner part of the gelatinous film. He washes in warm water, and thus obtains the same result as upon glass, since the image is attacked from below. It was remarked that M. Fargier himself had spoken of this method; but I do not think that he has described it so completely.

After successfully occuyying himself with the amplification of the photographic image, M. Bertsch has just constructed an apparatus which permits the image to be reduced to the smallest proportions. It is an automatic camera, identical with that which he made known a few months back, excepting that its size is appropriate to the object in view—that is to say, the production of microscopic images of the same kind as those which are now set in rings and other jewels. The principal difficulty in the execution of these little pictures consists in the focussing. As M. Bertsch's camera is set beforehand to the focus, which remains fixed for all objects at a greater distance than about five feet, this difficulty is obviated. The whole apparatus, objective glasses, &c., is contained in a box, which is scarcely as large as a glove box. It is very pretty and very ingenious.

A serious question was raised at the same meeting by a letter from the Council of the London Photographic Society on the attitude which exhibitors should take with respect to the strange place which has been allotted to them in the Universal Exhibition of 1862—among the constructors of apparatus and machinery. I can only express my personal opinion on the measure proposed by the Council of the Photographic Society. I think, then, that Sir Frederick Pollock's step was very commendable, and that the Council have done right in protesting against the intentions of the Royal Commissioners. But the position of the French Society is quite different. Its protestations can only be addressed to the Imperial Commission appointed to represent the interests of France for the occasion. Abstention would, in my opinion, and in that of many others, be attended with serious disadvantages, and also it could not be efficaciously resolved on by the Paris Society. You know how far our customs differ from yours, especially in the matter of association. All English photographers, whether amateurs or professional men, are members of some of the numerous societies which you have formed, and I do not suppose that individuals amongst them would act in opposition to any decision that had been adopted collectively. It is not so with us. We have but one completely organised society (that at Marseilles is, as yet, but nascent), and our one society is very far from including all French photographers. It would be useless for it to decide that artists ought to abstain from exhibiting at London: such a decision would fail in its effect. After reading the letters of Dr. Lyon Playfair and Mr. Sandford, I cannot help thinking that the first project of the Commissioners will be modified. Should this hope be disappointed, the writers who understand the artistic importance of photography are sufficiently numerous to call public attention to this refusal of justice. I am not speaking only of special journals: we have all sufficient access to the general press to protest therein loudly in behalf of photography; but I repeat that abstention would have regrettable consequences. We should do better to prove, by

the merit of the works exhibited, that they have a right to a special room, if not to a place among purely artistic productions.

While on the subject of Exhibitions, I will announce to you that the Photographic Society of Marseilles, which is being organised actively, solicits the co-operation of all photographers for their Exhibition, which will opened in September next. Let me commend the matter to the attention of English photographers, whom we reproach sincerely for the paucity of the specimens sent by them to the Palace in the Champs Elysées. Their absence has been remarked with regret, especially on account of the interesting character of the present Exhibition, which is much superior to all those which have preceded it. ERNEST LACAN.

[*New York, June* 11, 1861.

Our latest city business directory gives us a catalogue of one hundred and twenty-five places where photographic portraits for the people are taken. If we add twenty-five to this number, in justice to the suburbs across the rivers on each side of us, we have the total of one hundred and fifty photographic "galleries" within rifle-shot of the spot where I am writing. I therefore find that in our metropolitan district we have a public photographic privilege for each 5000 souls. And if we take these figures as a basis of calculation for the whole country, we reach the grand total of six thousand to represent the strength of our photographic army.

In our city galleries, of course, we find all grades of thrift, respectability, and other merit. The annual gross income of some of them has exceeded the sum of 100,000 dollars, while of others it is not sufficient to keep the sheriff out. A few of these establishments are erected on a scale almost gorgeous, with everything which money can procure for ornament or convenience. And I have seen the artist, "poor but respectable," in his garret—which was his parlour, kitchen, dormitory, nursery, studio, store-house, and all.

Of course we have plenty of humbug. It shows itself in absurd titles, as "Temples" or "Palaces of Art," "Professors of Photography," or the very common arrogance of new inventions and discoveries. An unsophisticated stranger would think our photographic galleries contained many a Zenxis and many a Faraday.

But observations of this sort apply as well to practical photography in London or Paris; and I forbear.

The variety of nationalities, however, which are represented in our photographic profession is a notable fact. The names in the directory list are suggestive of all the civilised nations on the globe. If I wanted to show what an odd assortment of names distinguish the individuals of the *genus homo*, what could I find better for my purpose? It begins with "Abraham" and ends with "Worms," and in the interim are several as funny; as, "Krikawa," with here and there a sprinkling of the familiar, like "Thompson," with and without a "p." New York is a kind of pudding-stone of humanity, composed of polished specimens of all sorts, kept in mass by the American cement. You have heard, perhaps, how we have sent English, Scotch, Irish, German, French, and Italian regiments to our war.

Last evening our Photographic Society met, and listened to three elaborate papers. The discussion turned chiefly on the uses of photography for military purposes; and resulted in a resolve to communicate with the Government on the subject. It seems pretty certain that photography will be used in balloon reconnoitreing, for which the Government is well prepared.

In my next I will endeavour to confine myself more rigidly within the proper limits of our art. CHARLES A. SEELY.

Nothing New under the Sun.—Mons. Mc-A. Gaudin, in commenting in *La Lumiere* upon an article which appeared in a contemporary, describing Mr. Dallmeyer's instantaneous shutter,* states that, instead of being a novel appliance, it is one of the oldest employed in photography for exposures varying from the eighth part of a second to twenty seconds, and is the only one, according to his experience, that meets all the requirements of instantaneous photography, or when views of moving objects are to be obtained by very short exposures—whilst, at the same time, it is suited for ordinary work. M. Gaudin claims the invention of the arrangement, which he states he introduced in 1841, or twenty years ago; and that since that time he has never used any other form of cap or instantaneous shutter. During four or five years he employed it in portraiture, and operated in public perhaps twenty thousand times. He states that he has already described the apparatus in three publications with which he has been connected. If the shutter is covered, or made with a flexible material, pictures may be obtained in the one-eighth of a second, without the apparatus being shaken by the concussion that necessarily takes place on the shutter being rapidly turned up and back again.

* See The British Journal of Photography, page 105 of the present volume.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

LENSES.

To the Editor.

Sir,—As a reader of your Journal from the beginning, I beg to solicit from you information how to improve my lenses, if at all possible. Some eight or nine years ago, I purchased a full-sized camera, with portrait lenses three and a quarter inches diameter, focus ten inches, with the intention of devoting spare hours to taking portraits. Ill health and the want of proper facilities for taking these led me to use my camera and lenses for copying prints, engravings, &c., and also often taking rapid pictures from my windows. In doing so I have not been at all pleased, for, while I get my pictures rapid enough, the field is not flat near the edge; indeed, in taking a picture of buildings, &c., reduced to quarter-size, nearly one inch round the edge of the plate is blurred and much out of focus, although I have wrought with the stop reduced to one inch. What am I to do? I cannot afford—indeed do not need—two lenses; nor will the want of light allow me to use a smaller stop, supposing that would aid me. I wish to use my present lenses to give me a rapid picture, sharp to the edges, with as large a stop as practicable. Can you help me?

In the report of the meeting of the Birmingham Photographic Society, held on the 30th of April, 1861, Dr. Anthony stated that Mr. Dallmeyer's triplet lens was constructed with a *negative* lens between the others. What is a negative lens? Would this suit my object? If so, what diameter, curve, and length of focus? But I am too fast. I shall be exceedingly obliged if you can suggest any simple method that will enable me to wile away leisure hours with my camera and lenses improved under your advice.—I am, yours, &c.,

IMPROVED LENSES.

[You may as well expect to be shown "how to make an ugly person handsome," as to make an inferior lens a good one. You desire an impossibility. You cannot have all your requirements in one instrument. Large aperture, flat field, sharp definition all over, are qualities incompatible with one another in the same lens. Make up your mind whether you mean to take portraits or landscapes; and if the latter, sell the lens you have and procure one fitted for your purpose instead: it would be idle to attempt to improve it.

A negative lens means a concave, either simple or compound—one that lengthens the focus. We cannot advise you to have it applied to the lens you have, which we have reason to fear is essentially poor.—Ed.]

A DIFFICULTY.

To the Editor.

Sir,—Many thanks for your indicative remarks on my stereographs. I am still, however, on the horns of a dilemma. Frequently has the attempt been made at longer exposure; but the sky in such cases has proved invariably so weak as to render the negative altogether useless for printing purposes, without painting out, which, when foliage is projected upwards, is a very difficult matter to accomplish well.

Till of late I have used only ————'s collodion, and plain albumen, viz., white of egg one ounce, water about one and a quarter ounces, and liquor ammonia eight minims. The only other I have tried is ————'s, the film of which is *exceedingly* thin after removal from the nitrate bath. The film yielded by ————'s is, on the contrary, very rich and creamy.

Having a very limited knowledge of chemistry, I have not directed much attention to the component portions of the material with which I work, and consequently cannot report on the composition of these collodions. If they both contain a bromide, it might be detrimental to add more.

May I beg of you a short reply in your next issue.—I am, yours, &c.,

J. L.

[The *thin* collodion which you indicate does contain a bromide. The other we have never examined; but, from your observations, we have little doubt that you would succeed best by *mixing them together;* and if you find still that the foliage will not come out, add half a grain of bromide of ammonium to each ounce of the mixture.—Ed.]

A SCREECH FROM GLASGOW.

To the Editor.

Sir,—Heering there was a lang screed on lenses in last number o' *Photographic Notes,* I actually gied and waur'd a groat in buyin' ane o' them; but after a guid inspection o' it, a gey and sma' opinion o' the "Note" had I; 'deed I wadna' gie ane o' oor City o' Glasgo' bank notes for a hail cart load o' them. Its just made up o' a' wheen havers, an' its sma' wonder the bodie that yedits it canna mak muckle o' Hughie's letter, for——but let that flee stick tae the wa'.

Odds, man! is it no illnatur'd o' Mr. Ross to alloo Hughie's letters tae be printed? I'll no believe—no never as lang as I live—that Mr. Ross

is a Scotchman, for a' that he has a Scotch name, after him doing sic a thing. Shame on ye, Tam Ross, say I; you're no your faither's son at a', man. But never mind.

Noo, sir, whatever nonsense there may be in Hughie's letter, he doesna say that he belangs tae ony lens-testing committee; an' it is barefaced impidence in ony bodie, even a yeditor, to sae that he does. This sam' yeditor—*yeditor* say I?—Muckle yeditorship it requires to compile a wheen news, that's only pipers' news when a's dune. Weel, be he what he may, he doesna' seem tae like the idee o' a committee tae test lenses. My fegs! he has gude cause for his dislike; for if they begin to test for ony ither quality than straught lines, I ken o' at least *ae mak o' lens* that'll bring disgrace on somebodie—and *that* somebodie I could easily name, but I winna. Twa spectacle een stuck in a tube will mak straught lines; but, my certie! they require some ither qualifications tae mak a good and reliable tool for a photographer. Na, na! Let opticians mak as mony lenses as they like, an', gif they want them tested, let them get practical photographers to test them. The compiler o' the "Notes" says—"*We*" (meanin' himsel') "*certainly should not consider ourselves competent to form one of a lens-testing committee, and should be unwilling to buy a costly lens on our own responsibility.*" Weel, puir man, he can keep himsel' easy—naebody is sayin' he is competent tae test a lens, sae he needna mak a fuss aboot it; but, O deerie me! a bodie that has sae little gumption as tae *write that aboot himsel'*, I hae my ain idee as tae his fitness for somethin' else that I could tell, but I'll no.

It's a grand thing is this adverteezin' that's carried on in the covers o' the journals. I see, in the same "Notes" I've been speaking o', ane by Mr. Ross, whaurin he says that his orthographic lens will bear tae be tilted a guid bit oot o' the horizontal without producing the leanin' appearance that ither lenses wad mak. Noo, if ye'll turn back tae page 223 o' THE BRITISH JOURNAL OF PHOTOGRAPHY, ye'll see a different story. Ane o' the very same lenses made some queer mark upon the perpendiclars o' Ely Cathedral on ane occasion, when Mr. Ross's ain private tester was cockin' up the camera tae get in mair o' the buildin' than was justifiable.

I am an auld hand at photography, and couldna resist the impulse I felt tae mak these few remarks, for which I hope ye'll forgie me. I suppose I maun just work awa' wi' the auld lens I hae, for fegs if I write tae some grand maker for leeve tae "try before I buy," he'll maybe serve me as they've served Hughie, and publish my letters, if I return the lens.—I am, &c.,

AULD LENS.

PAUL PRY'S VISIT TO MRS. SPRIGGINS.—A LESSON ON "SHARPNESS."

MY VERY DEAR SIR,—I hope I don't intrude, but I have just dropt in to say that I accepted that young lady's invitation. It wasn't intended for me. Oh! no. *I'm* too well known as a confirmed batchelor to be invited by young ladies to call upon their ma's; but I suppose there's more than Mr. Wall desiring information about sharpness (I wish he'd used my razor this morning instead of me, and had this sticking plaster on *his* chin), and if somebody else wanted information, why shouldn't somebody else receive it? So I, Paul Pry, patentee of key-hole photography, I, *don't you see*, went as somebody else.

Mrs. Spriggins, as I found out (never mind how), lives in a court, which is not a very light nor a very clean one. You go into it under a low, narrow archway, and down some broken steps, and your nose being assailed as you do so, you raise your thumb and finger hurriedly thereto, and drop your umbrella *all in the mud*—at least that's what I did.

Mrs. Spriggins, by a piece of card hung up in her front window, informs the civilised world that "whashin and mangerlin" are done there; her street door opens at once into her parlour without any formal ceremony of lobby, hall, or passage, and, when open, reveals the fact of newly-washed linnen, &c., being hung up therein to dry, which I assure you, my dear sir, is very unpleasant; for, when I went in, a damp garment (suspiciously feminine) knocked off my hat, and, somehow or another, a wet blanket enfolded me in its horrid embrace.

I was well received by that celebrated "litery" character, and she at once gave me her hand (and some soapsuds) when I mentioned your respected name.

Having told her of the invitation her daughter had extended to those who want to know of "sharpness—what is it?" Mrs. Spriggins exclaimed in wrath—"Drat that imperunt gall, she's allays a doing summat, that she are!"

Which may be very true of that industrious young lady, you know, and which fact I recommend to the attention of Mr. Wall (Eh! Eh! I know all about *him* too), for *he* is *not* a confirmed bachelor (poor fool), and an industrious wife, you know, *is* a great blessing.

Having asked the opinions of Mrs. S. on the subject of sharpness, that *very particularly* plump lady assumed an air of solemn importance, and, leaning forward, with one hand on either knee, and her eyes fixed sternly upon mine, thus delivered them:—

"Wich as how—my sentimingst—them are these! Wen that aire boy o' mine—wich a dear good boy he are—fust went to to sea with Capin Rumanpitch wich *he* goes to furrin parts called Sunderland or summat—'Mother,' says he, 'I wants your dogratype,'—wich, says I, packer rubbidge says I. Wel wen our loger wot takes on them potografs on glass tooked my room, wich a werry good loger he are—he tooked me for the boy wich as how says he, Mrs. Spriggins says he, you'll do for a specerlemen as well, wich in coorse I do sir, wen dressed. So he tooked me, and drecly I clapt hies hon hit (here Mrs. S. tightly compressed her lips, folded her arms, and frowned awfully) *I broked it all up!!!*"

"Dear me!" said I, after a dead silence of a minute or two.

"Sir," said Mrs. Spriggins, still more impressively, "*that aire were a 'sharp' pictur. Them wrinkles wos hawful, and them wrinkles wos all over the face—they wos!* THEM'S MY SENTIMINGSTS."

Thus, with an air of oracular dignity and importance, did Mrs. Spriggins deliver, as to a listening and eager world, her mighty sentiments on "sharpness."

Before I went away, I was introduced to Miss Spriggins (I wonder if Mr. Wall admires red hair, small eyes, and large mouths); and when her illustrious mama inquired "wot she writ sitch a letter for?" the fair young creature poutingly replied—

"Well, wot on it;—there, now,—I didn't mean nothin" (I believe this to be true), "only you was allays a telling on me to look sharp, you was. Thats why then,—there now!"

Incidentally I also gleaned the opinion Mrs. S. holds relative to "depth of focus;" for, while the picture in question appeared to have so exaggerated the texture of the skin as to move that otherwise amiable lady to great wrath, she also complained piteously that her beautiful new cap, with its blue and green and yellow flowers, and silver and gold leaves, came out like a white calico turban in a fog. However, no more at present from yours, very truly,

PAUL PRY, P.P.K.H.P.

Kew Rye House, June 26, 1861.

ANSWERS TO CORRESPONDENTS.

AN ADMIRER OF THE FINE ARTS.—In our next.

W. M. (Rudgwick).—We have forwarded your communication as requested.

C. D.—Because we do not care one single straw what such an one's opinion is.

ROBERT.—For subjects on a large scale you may produce fine effects upon plain paper.

F. S. W. T.—See THE BRITISH JOURNAL ALMANAC for the current year, pages 30 and 31.

MEDIÆVAL.—For general architectural subjects the orthographic lens is a *very* useful instrument.

A COUNTRY PARSON.—Received too late for insertion in this number. Shall appear in our next. Thanks.

STUPID DOLT.—Not our opinion of you. See reply to "Puzzled Amateur." To the last question—No!

F. O. M.—We cannot recommend any work *in preference* to the excellent "Manual of Photographic Chemistry," by Mr. Hardwich.

C. B.—We cannot recommend the process, especially to a tyro. Make yourself familiar with the wet process first—then select a dry one.

DELUDED ONE.—A good article will always command a fair price. We really cannot pity you, for you made the purchase with your eyes open.

P. O.—Mr. Negretti's method was published in a very recent number of this Journal; you cannot, therefore, be a reader, even if, as you state, you are a subscriber.

PUZZLED AMATEUR.—We have twice, if not thrice, disclaimed any participation in the views expressed. "Let every one have a fair hearing" is a good rule, which we like to follow.

BIRMINGHAM EXHIBITION.—Mr. Tyley, of Bristol, was, by a typographical error, miscalled Lyley in our first notice of this Exhibition. His speciality is that of photographing architecture and sculpture.

KNICKERBOCKER.—If you want to work wet collodion in the field we cannot perceive the use of a folding camera. You must have something in which to pack some of your chemicals, &c. Why not put them in the camera?

RICHMOND.—It is very objectionable to have a central gutter in your skylight. If you cannot have a sufficient slope from your sitter towards your door, let your light in that direction be horizontal, and slope it towards *one side*, whichever is most convenient.

C. M.—You will learn more in a month by joining a society, if one exist in your neighbourhood, than you can do alone in a couple of years. For an introductory manual take that recently published by Mr. C. Jabez Hughes, or that by Mr. Hockin—we should rather say both—and "tip up" with Hardwich.

J. B.—We do not know to which of M. Poitevin's processes you allude. That of M. Lafon will be found in our volume for 1859, detailed by our Paris correspondent. M. Joubert's process on paper has not been divulged by him: it probably bears some similarity to that published on glass, but most likely there is some additional point of manipulation important to success.

R. PEERS.—You make a statement, but omit your question; we hardly know what it is you wish answered. A collodion that dries of an opaque white colour is very impure; varnishing will remedy it to some extent, but you had better discard it altogether. The effect is due to the presence of cotton, with an insufficient substitution of atoms of nitrogen for hydrogen. There is no complete remedy.

DULL-HEADED SUBSCRIBER.—It is very difficult, almost impossible, to take a dark-complexioned lady in a white dress; but, in addition to this cause of embarrassment in your case, you have another in the presence of acetic acid in the bath: it should be slightly acid, but with *nitric* instead of acetic acid, as the resulting colour is whiter. Thin your collodion with a little ether, and use, as a developer—Photosulphate of iron, fourteen grains; water, one ounce; nitrate of potash, ten grains; acetic acid, half a drachm.

W. WILSON.—We believe that ordinary mastic varnish is suitable for use on glass positives that are to be coloured; but the dealers in powder colours usually supply a varnish specially adapted for the purpose. For negatives the Soehnée varnish, or pure amber dissolved in chloroform, will meet your requirements. For positive iodiser see page 28 of THE BRITISH JOURNAL ALMANAC. Mr. Jones is not the *inventor* of the resin process, nor does he make any claim to such honour; but he has very successfully carried it out. For details you have but to refer to recent numbers of this Journal. Place your sitters between the first and second window from either end and looking towards the further angle from the door.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 146, Vol. VIII.—JULY 15, 1861.

Photography at the International Exhibition.—There is a story extant of a celebrated performer—a wit, a scholar, and a gentleman—one whose convivial qualities brought him into great request, and whom a certain Duke was desirous of securing in order to make a heavy dinner party in prospective pass off with *éclat*. The Duke, however, desirous as he was of the presence of the wit, could not relish the idea of placing himself on a level with a *mere actor;* and had the bad taste to send him an invitation intimating that the Duke of A—— expected some friends to dinner on such a day at seven o'clock, and trusted that Mr. B—— would favour him with his company at nine. Mr. B——, in reply, thanked the Duke for his condescension, and regretted his inability to accept the invitation owing to a previous engagement on the same day and hour to *partake of a supper of tripe* with the Marylebone Pet (a celebrated pugilist).

We have been thinking that the invitation of the Royal Commissioners for the forthcoming International Exhibition to the body of photographers has been conceived much in the same spirit as that of the Duke towards the actor. "Bring your choicest and best productions, gentlemen; let your collection be unique for excellence: it shall be heartily welcome to a capital place——in the kitchen. In the drawing-room? No! Why, you see, we are full there with people who are dressed in much finer clothes, and we fear yours would suffer by comparison; and we assure you you will fare much better in the kitchen. And, besides, *there* you may arrange the furniture as you like: you may even turn out some of the tables and chairs if they are in your way; and you can place yourselves just as you please: so don't wait any longer, but send your foremen at once to talk the matter over." But, some how or other, photographers don't seem to perceive the compliment, and have a *prior engagement to a tripe supper.*

Seriously, we rejoice to notice that the general feeling of photographers is one of indignation at the contemptuous manner in which the remonstrance of the President of the Photographic Society has been received. But when we use the term general we do not thereby mean universal; for in some few instances (very few) the classification of the Royal Commissioners appears to have been approved. Though we may wonder at such obtuseness of vision, we have nothing to urge against those who entertain this view from contributing their productions; but it is with deep regret that we perceive our brother editor of the *Photographic News*, who has been loud in his condemnation of the absurd classification adopted, now advocating a temporising policy, and recommending the acceptance of a nominal concession in the shape of a separate room, when the real offence—that of the classification—remains just as insulting as ever. What do photographers care about where their pictures are placed so that they are in a good light and in a position to be properly viewed! They do not desire to have them hung in the same room with paintings, or even engravings; but they do require that their productions shall be recognised as "works of art," and as such reasonably demand a rectification of the mis-classification adopted. If this be not so, why do *artists* interfere in photography at all? Why not let those artisans, photographers, follow out their own *mechanical* devices?

Of course we do not anticipate that every photographer will abstain from exhibiting, even upon the humiliating terms of the Royal Commissioners; but we certainly consider that each one who may do so voluntarily foregoes all pretension for the future to claim the title of "artist." It is objected by our contemporary that under such circumstances an imperfect exposition of our art will be presented to the public, and that is regarded as a greater evil than the acceptance of the ignominious position assigned. We do not think so. We hold a directly contrary opinion, and consider that the acceptance of that ignominious position will be far more detrimental to our art and to the profession than any abstinence from exhibiting.

But there is another and a better course to be pursued—one which the Council of the Photographic Society has, we believe, under consideration: we mean the organisation of as perfect a collection as it can get together, to be opened to the public at an earlier date than that fixed for the South Kensington affair. We believe that the Council will, if it adopt this course, not only be promoting the best interests of the art and its professors, but at the same time doing that which is most conducive to the benefit of the Photographic Society.

We entertain a strong opinion upon this point; and, without a concession of the "classification" offence on the part of the Commissioners, our cry will be—"No Surrender!"

Personal Accusation.—In the second annual report of the South London Photographic Society [see page 240 of the current volume] there are two paragraphs which appear to demand some special notice from us, the compiler of the report having, in a manner very unusual in such a document, chosen to cast an imputation of a personal character which the facts of the case do not at all warrant. We extract the passages to which allusion is made as follows:—

> The Publisher and Editor of The British Journal of Photography, placing an interpretation upon the connexion existing between it and the Society never directly or indirectly accepted by your Committee, and claiming certain exclusive privileges tending to cripple the independence of the Society and retard its influence in propagating and advancing the art, such claims were not admitted; and an engagement made for a term with the Publisher was, in consequence, by him abruptly broken, although the Committee, resolving that their engagement to the members should be more justly carried out, procured the Journals at an increased rate of charge, and forwarded them post free as usual.
>
> In consequence of this misunderstanding, the hitherto pleasant connexion between this Society and The British Journal of Photography has ceased. We can no longer be regarded as associated in any way with the trade interests of any particular periodical, and each member may select for himself such journal as best pleases his own taste or judgment; while, by supplying at least two presentation prints per year, and rendering the Society even more actively useful in new departments, we must endeavour to fully compensate our members for what might otherwise be regarded as a something lost. We trust, therefore, that the support the Society has hitherto received—and we may fairly say *deserved* also—will not be withheld, and that the conduct of the Committee in supporting the proper dignity of their position will give satisfaction both to the members and the friends of the Society.

Now, if these assertions mean anything, they declare that the Publisher of this Journal failed to carry out an engagement into which he had entered, and that the Editor attempted to set up claims to which he had no right, and which tended to cripple the independence of the South London Society. These are very grave charges, and should not be lightly brought against any one; but as it appears that the "report, &c., received the sanction of the members present," without any inquiry having been instituted relative to the accuracy of the accusation, we have no course left but to record a distinct denial of the allegations. We believe that we should be justified in applying pretty strong language to this breach of etiquette on the part of the Committee, each and every member of which has, by his silence, made himself responsible for the charges made; but a simple detail of the facts of the case will at once exonerate us, and will be more in conformity with our usual practice.

The British Journal of Photography having been voluntarily selected by several societies in the United Kingdom as their special organ, in which *official* reports of the various meetings should be published, and which should be favoured by priority in the use of all papers read (in some cases with their exclusive use), the Proprietor and Publisher of this Journal, at our suggestion, by way of acknowledgment of the compliment conferred, voluntarily conceded to those societies which had thus honoured us the privilege of a supply of copies of this Journal to their various members at a rate of charge reduced below the ordinary publishing price; but this concession was intended to apply *solely* to those societies which had paid us the compliment indicated. In consequence of some correspondence between the Secretary of the South London Society and the Publisher, the name of that Society was inserted on our title-page, we having understood from the Proprietor—what he had most assuredly believed—that this Journal was thenceforth to be the *official representative* of that Society. Shortly after the *Photographic News* was placed under the management of the gentleman who at present edits it, we found not only that we were systematically forestalled in the publication of the papers read, but that frequently we were subjected to serious inconvenience in procuring them at all in proper time. We therefore personally inquired of the Secretary (privately) whether he had any desire to transfer the *official representation* to our contemporary, stating, at the same time, that if such were his wish *we should not offer any impediment* to the change. We received an unhesitating and distinct reply in the negative. Finding, however, that matters continued in the same unsatisfactory state, we then addressed several letters to the Committee of the Society—in one requiring either priority in the use of papers read at the meetings, *or* the removal of the *merely nominal official representation* which then existed; and we were informed that the Committee did not recognise any *official* connexion beyond the fact of this Journal being circulated amongst the members of the Society. Yet, notwithstanding this assertion, upon an occasion when our reporter committed some errors which were inadvertently left uncorrected, special notice was taken of the matter publicly at the succeeding meeting, on the ground that our Journal being the *official organ* of the Society was bound to have a correct report. Moreover, the Secretary has several times put in a claim to be permitted to revise the report on the same ground.

As we did not choose to remain with the ridiculous pretension of *official* representation after the same had *de facto* ceased, and were unable to procure the sanction of the Committee to the removal of the name of the South London Society from our title-page, we caused it to be removed on our own responsibility; and with its removal, as a matter of course, the special advantage to the Society regarding rate of charges ceased. This we did quietly, and without calling public attention thereto, purposely in order to avoid giving needless offence to the Committee; and, had it not unwarrantably imputed dishonourable conduct on the part of the Publisher, and unreasonable assumption on our part, we should have abstained entirely from any notice of the circumstance.

In conclusion, we make no complaint against our brother editor relative to his proceedings in this matter. He had a right to use such influence as he possessed in order to supplant us if he could. But we do complain that the Committee of the South London Society chose to avail itself of the advantage afforded by us to those societies which we *officially* represent, while at the same time it stultified the pretension by a systematic disregard of its duties to us.

We have made diligent inquiry into the alleged breach of engagement on behalf of our Publisher, and we are in a position to give an unhesitating denial to the existence of any engagement extending beyond the pleasure or convenience of either of the contracting parties. We are at a loss to comprehend what is meant by the expression that the South London Photographic Society "can *no longer* be regarded as associated in any way with the trade interests of any particular periodical." We are certainly not aware that it ever was so associated—certainly no *trade interest* was ever derived by this Journal from its so-called connexion with the South London Society; and the kind permission accorded to "each member to select for himself [at his own expense?] such Journal as best pleases his own taste" is no doubt very gratifying to the parties concerned.

We have been forced into these remarks and explanations by the unfounded imputation applied to us, possibly through inadvertence by the compiler of the "report;" but there is no excuse for the members of the Society who sanctioned such report, and still less for the Committee which adopted it.

We have to apologise to our readers for occupying so much space upon a personal matter, to which we are always averse; but we consider that an explanation is due to them, and that to have been altogether silent would have given some show of colouring to the presumed truth of such a charge.

NOTES ON THE HOT WATER PROCESS.

By A Country Parson.

As requested I forward you particulars of the hot water process as I practise it. For the sake of clearness I will first give the formula and manipulations which, in my hands, give the best results, and then add a few notes which may be useful to those trying the process.

Collodion.—Keene's dry or Pyne's positive.

Bath.—Thirty grains of nitrate of silver to the ounce, faintly acid.

Washing.—Place the plate in an upright bath, containing filtered rain water, till greasiness disappears; then wash *slightly* under a tap; and, lastly, place it for about two minutes in a basin of water.

Albumen Solution.—One pint of albumen to two pints of water, and ten drops of ammonia to each ounce; applied in the usual manner.

To Coagulate.—After pouring the albumen off closely, dip the plate at once into a porcelain bath, containing water nearly at the boiling point; place on blotting-paper till surface dry, and finish at the fire.

Exposure.—Same as for collodio-albumen.

Developer.—One grain of pyrogallic acid and three-quarters of a drachm of Beaufoy's acid to one ounce of water.

Now for the notes.

Of the two collodions I name, Pyne's gives more half-tone, and has the advantage of being cheaper. In dull weather, however, when there is often a difficulty (not peculiar to this process) in obtaining intensity, I prefer Keene's. I have never had a blister. There is a letter, in the last number but one of your Journal, beginning with the slightly enigmatical sentence—"I have already tried the effects proposed for the use of hot water," in which an edging of albumen is recommended to be put round the glass before coating with collodion. This is quite unnecessary. After fixing I wash under the pump, with a full stream of water, and have never had a film wash off, even with this rough usage. The film is almost as tough as the collodio-albumen.

Neutral, faintly acid, and very acid baths, have all given me good pictures. The plates from which the pictures I forwarded to you

were printed, and which you said were excellent, were sensitised in an old collodio-albumen bath, much discoloured, and with half a drachm of glacial acetic acid to the ounce; so I think I may say considerable latitude is allowed. I observed that Mr. Parry said, a month or two ago, "he found a neutral bath would not do, as it yielded fogged pictures." I have not found this to be the case. I fancy he must have used a light unprotected by a yellow shade during the preparation of the fogged plates. I find they are extremely sensitive at some period of the preparation, and that if a naked light be used the plates will be fogged however acid the bath. Of course I am here alluding to artificial light.

If hard water be used for the first washing, pin-holes will be the result—particles of chloride being deposited on the plate which the after-washings fail to remove. I wash but *slightly* under a tap, since it is almost impossible to wash away evenly the free nitrate of silver from the surface of a plate by a stream of water falling on it, unless the washing be very prolonged. If any one doubt this, let him soak a plate, coated with collodion, in some strongly coloured solution, and then try to wash it off under a tap: he will see how it collects in eddies at the corners of the plate, and what a time it takes to remove it. The soaking in water removes the free nitrate evenly and effectually from the surface, and leaves an equally sensitive film all over the plate. I have never had a picture spoilt by stains or uneven development since I have adopted this plan. The water I use for all the washings except the first is very hard, and of so bad a colour that it has to be filtered before it can be used for the table. Of course I use this from necessity, not from choice; but I mention it to show that the process is not what one may call "nasty nice."

The exact strength of the albumen solution is a matter of indifference. It must be remembered, however, that the weaker a solution of albumen is, the greater the heat required to coagulate it. The ammonia should on no account be omitted: it modifies the structure both of the albumen and the collodion, rendering them less contractile. The result of omitting it would be to render the film liable to peel off during the final drying after fixing.

I see Mr. Parry takes objection to my mode of dipping the plate at once into hot water, as being likely to damage the plate so dipped, or the next one. I have never found it in practice to spoil the plate itself: what it might do to the next one I cannot say, as I have a large kettle of hot water by my side, and use fresh for each plate. Of course I am careful to pour off the albumen as closely as possible. I used to set up on blotting-paper to drain; but I found that, unless I was very careful not to leave it beyond a very short time, one side of the picture developed more intense than the other, owing either to the albumen having drained from the top of the plate or dried into the pores of the collodion unevenly.

The thanks of "dry" photographers are due to Mr. Parry for calling attention to this forgotten process; and, though differing from him on the above minor points, none will thank him more heartily than myself.

[In consequence of the excellence of a couple of proofs received from the author of the preceding paper, we requested the details of his method of manipulation, which he has kindly given as above, and accompanied his paper by a specimen negative, to which allusion is made. For delicacy of detail and half-tone, combined with absolute freedom from stains and blemishes of any kind, this specimen is not surpassed by any that we have seen.—Ed.]

THE LAST NEW CARBON PRINTING PROCESS DEVISED

By M. Poitevin.

This process, which was mentioned in our last by M. Lacan as affording excellent results, has been reported upon by a sub-committee of the French Photographic Society in terms of high commendation.

M. Poitevin, if not the author of carbon printing, was certainly one of the earliest discoverers in this field of research; and, as often happens, many of his suggestions have been adopted by subsequent experimenters without the slightest acknowledgment. So far as we can judge from testimony alone, without having repeated the experiments, the problem of carbon printing, in a really practicable manner for ordinary photographs, appears to have been solved.

The following are the details of the process, which is dependent upon the hygroscopic properties acquired under the influence of light by a mixture of *perchloride of iron* and tartaric acid:—

Sheets of *ground glass*, of the finest kind, are perfectly cleaned; first, with a solution of potash, then with water acidulated with hydrochloric acid, afterwards with plain water, and finally dried with a clean linen cloth, and all particles of dust removed with a brush of badger's hair. The sensitive liquid is then poured on and spread by aid of a glass triangle, or a clean camel's-hair pencil.

The sensitive liquid is thus made:—Dissolve in an ounce of common water 150 grains of commercial *perchloride of iron*. In another ounce of water, in like manner, dissolve 75 grains of *tartaric acid:* filter each of these solutions separately, and, after filtration, mix them together, then add sufficient water to make up the whole quantity to 3½ ozs. It is important that the filtration of each solution shall be performed before mixing them; because commercial perchloride of iron always contains some sesquioxide of the same base, which is soluble in tartaric acid and injurious to the operation. This sensitive mixture is unalterable if carefully preserved from the light, and may be used to the last drop.

To prepare a plate, the above-cited mixture is to be poured on the ground surface of the glass, as above directed, and, when spread all over it, the excess may be poured off. A slip of blotting-paper is to be applied along two opposite edges to remove the last excess of surplus, and to equalise the film of liquid left on the glass, which is then to be placed in a dark and dry place, at an angle of about 45 degrees, and left for twelve hours to dry spontaneously—though, if time be an object, it may be dried artificially by means of a stove or any similar contrivance; but, whatever plan may be adopted, the plate must be perfectly dried before being impressed, and, if kept in a dark and dry place, it will remain good for two months or more.

The negative employed should be well varnished with copal varnish (as greasy or gummy matters are injurious to the plates), and placed in contact with the prepared surface. The exposure in sunshine for a good negative not too dense, but full of detail and half-tone, should be about five minutes; but, as in all other processes, this must depend upon the intensity of the light and the character of the negative. It is better to over than to under expose, and the action may be to some extent watched, as the colour of the film changes from yellow to light brown under the influence of light.

After exposure and removal from the pressure-frame the impressed plates may be stored away for future completion, or allowed to remain for a short time in darkness (as may be most convenient), in order that the moisture of the atmosphere may condense on the exposed portions of the film, the protected parts remaining perfectly dry.

Finely pulverised carbon is next applied all over the surface, by means of a very soft brush of badger's hair: the image soon appears black, and at each passage of the brush a fresh quantity of carbon adheres and deepens the impression. This operation should be arrested as soon as sufficient intensity is acquired—a condition that may be readily judged of by laying the plate, film downwards, on a sheet of white paper. It is not necessary to operate in a dark room, but in one feebly lighted. The black colour may be modified by the after addition of any other colour in powder. In case any portions of the picture appear too slightly impressed, it is possible to remedy the defect to some extent by breathing on those parts, and again using the badger's-hair brush with the pulverised carbon; but it is not advisable to resort to this plan needlessly, as it is apt to injure the lights of the picture.

If the plate be perfectly dried before exposure, the protected parts repel the carbon; but there is always a very small quantity that will adhere lightly to the white parts, which gives it a greyish tone, and materially reduces the brilliancy. One of the most ingenious parts of the process is the removal of this small quantity of carbon from the lights, which is effected by M. Poitevin in the following manner:—With a tuft of cotton some white glass pounded very fine, or some of the finest Fontainbleau sand well sifted, is rubbed over the proof, either of which effectually removes the superfluous particles, by a species of dry-washing process, as M. Poitevin calls it.

If the proof be too weak, it may be still further intensified by the carbon as before, and again dry-washed.

The image is then transferred from the glass to paper in the following manner:—

Some plain collodion, of a fluid but tenacious character, is poured over the plate, and, when well set, is washed in common water, then with water slightly acidulated with hydrochloric acid, and again with common water; then a sheet of moist paper is applied to the surface of collodion and pressed in close contact therewith, and allowed to dry spontaneously, when it becomes detached from the glass, drawing away with it both the collodion and the impression.

A fresh sheet of paper, covered with a film of gelatine or gum, is then pressed in contact with the previous sheet bearing the image, both being moistened, and, on drying, the film leaves the first sheet and adheres to the second. The image is thus protected by the collodion film; but M. Poitevin recommends that it should be varnished or covered with gum.

The process is alleged to be very certain, easy, and inexpensive, as in case of failure the collodion and gelatinised paper are not employed, because the progress of the operation is visible at every stage, and no one need proceed with a faulty impression.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

NITRATE OF SILVER.

Synonymes.—Lunar caustic, luna cornea, lapis infernalis. Fel metallorum. Centaurea mineralis.

Composition.—Ag O NO_5 or Ag NO_6.

Equivalent.—170.

Preparation.—This salt is best prepared by the direct action of pure nitric acid on pure metallic silver, and evaporating the solution to dryness, or until it is strong enough to crystallise on cooling. But, as these materials are not always readily obtainable, it becomes desirable to know how to make the salt with the commonest form of silver, viz., the standard silver of the realm—an alloy consisting of 11·10 silver and 0·90 copper. It will be obvious that the solution obtained by the action of nitric acid on this alloy will contain nitrate of copper; and, in order to separate it, it has been recommended to evaporate the solution to dryness, and fuse the mass strongly, in order to decompose the nitrate of copper. This method of operating, however, causes the formation of *nitrite* of silver—a very injurious substance to introduce into a nitrate bath; and as it has not been ascertained that nitrate of copper exercises any detrimental effect on the formation of a latent image (any more than the nitrates of cadmium, potassium, or ammonium—salts often contained in a nitrate bath), or is in any way affected by the actinic rays, the necessity for its total separation cannot be regarded as well established. If the solution be simply evaporated until strong enough to crystallise, the crystals dissolved in pure distilled water and recrystallised, they will be found quite pure nough *even* for photographic purposes, at least so far as extraneous *metallic* impurities are concerned. The great enemy, in a photographic point of view, to be guarded against in the preparation of nitrate of silver is *organic matter*. The coins employed for the purpose should be well cleaned, both mechanically and by boiling in strong soda; and even when this precaution is adopted there are numerous other ways in which minute traces of organic matter will, as it were, creep in, for the mere filtration through paper will furnish it to the solution. In the preparation of a nitrate of silver bath, therefore, it is better, before adding the acetic or nitric acid, as the case may be, to expose the simple solution of nitrate of silver to the direct action of the sun's rays during several hours, when, such is the avidity with which this salt combines with organic matter, it will be found completely separated by the action of light, and, on filtration, and the addition of a due amount of acid, will yield a nitrate of silver bath of the purest kind; and this method of exposing to sunshine should be adopted even when the greatest confidence is felt in the nitrate of silver employed, as the distilled water which is sold for the purpose will invariably contain traces of organic matter. The above digression from nitrate of silver to nitrate of silver bath has been deemed not altogether out of place, referring, as it does, to the most important application of the salt in question.

Properties.—White, transparent, hexangular tables or right rhombic prisms, of a powerfully metallic and bitter taste; anhydrous; soluble in an equal weight of water at 60°, and in half that quantity at 212° and in four parts of boiling alcohol, the greater part being deposited on cooling. Pure recrystallised and dried nitrate of silver appears to have a feebly alkaline reaction on reddened litmus paper. The crystals are very heavy, and melt at 426° Fah., and, being run into moulds, it forms the fused nitrate of silver of the shops, or the lunar caustic used by surgeons. At a higher temperature than 426° it is decomposed with formation of nitrite; and in view of this fact the use of fused nitrate of silver for bath solutions is open to grave objections, unless special attention has been given to the temperature at which the fusion is effected.

Uses.—This salt is the *sine quâ non* of the photographer, and is used in almost every process where it is desired to prepare a surface highly sensitive to actinic rays.

Impurities.—These may be of two kinds, namely, those arising from accidental contaminations of the materials employed in the preparation of the salt, and those intentionally introduced for the purpose of adulteration. Among the former may be mentioned nitrate of copper, sulphate of silver, and nitrate of lead—the first arising from traces of copper not completely separated in the process of purification, the second from the existence of sulphuric acid as an impurity in the nitric acid employed to effect the solution of the metal, and the third from the presence of traces of metallic lead remaining in the silver through insufficient cupellation. A fourth accidental impurity sometimes occurs in *fused* nitrate of silver in the form of nitrite, arising from want of attention to the temperature at which the fusion takes place, which should never be higher than 426° Fah. The intentional sophistications are nitrate of potash and nitrate of lead. It may be observed that one of the advantages attaching to the use of fused nitrate of silver is the complete oxidation of the organic matter, a proportionate amount of nitrite being formed; but this may fairly be regarded as the lesser of two evils.

Tests.—The existence of copper in nitrate of silver would be indicated by the production of a blue colour on the addition of an excess of ammonia. Ferrocyanide of potassium is also an extremely delicate test, indicating one part of copper in 60,000 of water: it produces a puce colour in solutions containing traces of that base. For the detection of sulphuric acid existing in the nitrate as sulphate of silver, nitrate of baryta is the appropriate test. The presence of lead might be ascertained by adding an excess of hydrochloric acid to the suspected solution, boiling the precipitate and liquor together, and filtering while hot. The filtrate will give a black precipitate with sulphuretted hydrogen, if lead be present; a portion also, when cold, and if sufficiently concentrated, will yield a yellow precipitate of iodide of lead on the addition of iodide of potassium. The presence of nitrate of potash would have so little effect, except that of reducing the strength of the bath, that it is scarcely necessary to enter into a description of the method by which its presence might be determined.

Effects of Internal Administration.—Nitrate of silver is a powerfully corrosive poison, and when swallowed in quantity with suicidal intention, it produces great irritation, with vomiting of a white flaky matter, *which darkens on exposure to light.* Coloured spots on the skin may also be taken as an indication of the presence of this poison.

Antidote.—Common salt, being a remedy always ready to hand, may be judiciously administered in cases of poisoning by this salt. It acts by rendering the silver insoluble and, for a time, inert; it should, however, be followed by emetics, in order to remove it from the system. Magnesia may also be employed either separately or in conjunction with common salt. Both should be followed by emetics, and, if great inflammation exist, demulcent drinks may be freely given.

INSTANTANEOUS PHOTOGRAPHY.

By B. Marc.

A great deal has been written and spoken lately on this subject, and a good deal has been *done* in it, too; though I have a strong suspicion that there has been more talk than work—in some quarters, at any rate.

Are the so-called "instantaneous pictures" really so? is a reasonable and pertinent question one hears asked. In many cases the answer can be satisfactorily got from an examination of the pictures themselves. The waves do not wait to have their picture taken; nor can anyone suppose that *all* the passengers in a crowded street could, by any arrangement, be got to stand when the photographer said "Now!" Anyone can satisfy himself, then, in such cases, how far these pictures deserve to be called "instantaneous." For myself, I think there has been latterly a great deal of nonsense in the puffing talk about some fine, rapidly-taken, though far from instantaneous, photographs. With few exceptions, the operators themselves have left the photographic world pretty much in ignorance about some of the more remarkable and certainly truly instantaneous pictures. Not that the best artists are all, I think, either disposed to be over-secretive or unwilling to help their brethren who are a little lower down the ladder. Still less do I think they at all deserve the character a contemporary lately gave to Signor Beato, of systematically humbugging amateurs by giving varied, and probably in every case incorrect, formula. As illustrative of how this *useless* talk goes on, see how much has been said of the pictures of the Boulevard de Sebastopol by M. Ferrier. If Ferrier wanted the photographic public to

know how these pictures were taken, he could easily tell it in good intelligible French. What has he done? and how much is *known*, after all the late trumpeting? A little has been said, but nothing is known. Is anybody aware whether the pictures shown are from *collodion* or from albumen negatives? No one ever heard of Ferrier but as the clever and successful operator in albumen. The reasonable presumption, in the absence of information, is, that these pictures are from albumen negatives—that old slow dry process. Why write one line about the manner in which such pictures have been obtained without giving this information? Some photographic friends to whom I suggested this at once replied that it *must* be by collodion—wet collodion. That is just exactly what I want to establish. Is it so? No! Instantaneous pictures have been done by a dry—commonly called a slow—process. See, for instance, the pictures exhibited at the Edinburgh Exhibition, nearly three years ago, by Mr. Kibble, of Glasgow. In one picture a steamer is seen passing the field of view, yet every part of her rigging is as sharp as can be desired. I repeat, then, that, in view of the undoubted possibility of taking pictures rapidly by any *dry* process—and still more from the fact that such has been accomplished—I hold the presumption to be fair that Ferrier's pictures are by the albumen process. M. Ferrier made no communication to the Photographic Society of France while laying his views before it; but only a *viva voce* remark on the greater difficulty of taking street views as compared with sea views; as, in the latter, a little movement is not seen, while the least motion in the objects represented in his views destroys the sharpness of the picture at once. The reporter of the meeting adds that the only peculiarity in M. Ferrier's "preparation" is the "addition of a small quantity of formic acid to the silver bath." That is all the information furnished by M. Ferrier *and* the *Bulletin*. Another report adds that the lenses used were Dallmeyer's stereo. lenses. Probably—or, at least, possibly—all this is correct; but for any practical purpose, even if all true, the information is nearly valueless, while we do not even know by what process the whole thing is done.

Similar uncertainty prevails to a great extent regarding the productions of another talented artist, George Wilson—uncertainty about how his pictures are produced: there can be none in the minds of any competent judge regarding their quality. A friend of Wilson's was laughing the other day in my presence over what he called the nonsense of saying George Wilson uses this lens and that lens. "Why," said my friend, "I believe he gets every lens for stereos. that comes out, and tries them all, and he is not likely to throw away the pictures he takes in these trials." But that is exactly doing what I object to—retailing second and third-hand reports of what Mr. So-and-So *does;* for the same mutual friend has gone the length of informing me precisely by what collodion a particularly first-rate view of Wilson's was done, and I could have a pound of the same if I so desired. I would simply wish to protest against this *Morning Advertiser* sort of back-stair mode of getting information. I do not shut my eyes to the thirst there is for formula—formula without any caring about principles.

Again let me guard against being misunderstood. I do not for one moment mean to doubt that the disclosures made by friends of successful operators are correct, and that the information is reliable. Nor do I exactly mean that, when any journalist says "we believe Mr. So-and-so uses so-and-so," the said journalist has good ground for not believing anything about it. Not at all. But what I desiderate is information from the fountain-head. Some clever operators are deterred from writing because they say there is nothing to reveal. In some cases they are afraid, even though they were to give their whole manner of operating, and perhaps also to point to the peculiar feature to which they ascribe their success, that trial by others might prove that the supposed important novelty was nearly, if not altogether, useless. Witness the excitement created by the pictures of Mr. Stewart, brother-in-law of Sir J. W. Herschel, and the information which was at once communicated that an air-pump was used in the preparation of the paper!—and how everybody got air-pumps, and nobody got pictures like Mr. Stewart's! Afterwards, in giving very full details of the whole mode of procedure, Mr. S. seemed sorry that enthusiastic disciples had found that procuring an air-pump had not ensured fine photographs. Rather discouraging that! A very great noise is made about Mr. Stewart's fine pictures, and it oozes out that an air-pump has been seen in his operating-room. Everybody is anxious to know all about this new plan, and to try it. Mr. Stewart gives very full and faithful details of how to ensure success; and what then? He has a host of followers? No! The easiest and most simple paper process is never heard of more! Some knowing ones hint a truth worth remembering—that perhaps it was Mr. Stewart, and *not his process*, which made the fine pictures. That truth is exactly what I wish to repeat regarding the means of producing so-called "instantaneous" photographs. The *men*, not the *means*, have made these pictures; but they could not do so without the means.

One of the first to show pictures so rapidly taken as to give an image of objects in motion was, I think, Professor Maconachie, then of Glasgow. He showed some pictures at the *first* meeting of the London Photographic Society. They were at once recognised as wonderful; and it seemed as if the producer of them had dropped from the clouds he so faithfully depicted. When the meeting was over, nobody knew who he was or where he could be found. Somebody said they thought he was a Scotchman—probably hazarding that opinion in consequence of one of the pictures shown being a view at Granton, near Edinburgh. By-and-by the Scotch gentleman took a more definite shape in the Society's Journal, in a letter to the Secretary (Mr. R. Fenton). Mr. Wellwood Maconachie detailed in this letter the preparations he used in taking the pictures which had commanded so much approbation. He recommended a *stable* normal collodion, iodised in the usual way, to which he added *iodide of iron* when about to operate. That was the peculiarity in his process. Iodide of iron had been used before in photography, and it was known to give great sensibility. Since then no one who has written on the means of producing pictures *rapidly* has proposed the addition of any new or before-unused substance in the collodion. Mr. Fry, who has taken some very pretty instantaneous views, has favoured the photographic world with an account of how he produces them. The collodion he uses many would esteem rather slow, if not unfit for negatives at all.

The silver bath has had no peculiar additions made to it, either, for instantaneous pictures; and sometimes, where a modification has been proposed, other equally successful operators have advised an opposite course. Perhaps the weight of recommendation is in favour of a neutral bath for the most rapid working in collodion. The most recent plan, and perhaps the most irreconcilable with our previous notions, is that of M. Ferrier, referred to before, namely, that of adding formic acid to the silver bath. Mr. Maxwell Lyte first used honey to give increased sensitiveness, in order to get something like instantaneous views. This idea of adding something to the sensitised film, to make it more delicately so, seems to have been less followed up than one would have anticipated.

Lately, it appears as if all the powers of our photographic brethren had been directed to the developing, as the point where the most improvement could be hoped for. The collodio-albumen process of M. Roman, which M. Chevalier, of Paris, ushered into the photographic world lately with so much laudation, has nothing in it to lead an operator to hope that one whit shorter exposure would suffice with it than he may have been in the habit of finding suitable in following the direction of Taupenôt himself, except it consist in using the developer hot. Leaving a portion of *free nitrate* looks much like going back.

Long ago, M. Le Gray said he believed the image was on the sensitive surface from the first instant it was exposed; and he added that we only wanted sufficiently powerful developers to bring out this latent image. Did he succeed in practically following up this idea in taking those really beautiful instantaneous pictures which made his name a household word some years ago? Or were they taken by the same materials—used in much the same fashion—as others were then getting their slow pictures by? We are left in ignorance on these points.

Strong developers, rendered more powerful by being used warm, and long continued developing—these seem the directions in which the tide now sets for quick pictures. Mr. Kibble said he developed in some cases for ninety hours—a severe trial this for these powerful developers and the long continuance of their use. Suppose Le Gray is right and the image is *all* there from the first: there must be no fogging tendency, nor dirt, and no diffused light *anywhere*.

Deepening seems almost to be recognised as a main element in any plan for taking instantaneous pictures; and in the talk lately going on in some quarters on this subject there has been a great deal of the *exhuming* business going forward. Not a bad plan this going over the old journals and "makin' auld claes look a'mast as weel as new!" It would be just as well to call to call them by their old names and give their real paternity. By the way, has not some one lately brought forward the use of tincture of iodine in deepening, as if it were a novelty?

The attention of photographers was early directed to the improvement of lenses as a likely element in obtaining shorter

exposure. A great deal of noise has lately been made about the improvement in lenses. Somehow I cannot help thinking there is more "gas" in the lens market now-a-days. Some very good lenses were made many years ago. Perhaps more people now know that a bad lens is very dear at any price, and there are probably one or two more opticians who make good lenses; but I do not believe there has been any revolution in lens-making latterly. It is perhaps as well that photographers should not be deceived and expect some wonderful results from the lenses now making and being bepraised. I have given some attention to this subject, and have no doubt there is no more rapid lens in existence than the old landscape lens. I leave out all consideration about straightness of lines: that is not before us now. Those who have done instantaneous views do not, as a whole, use or recommend any particular lens; in fact, the pushing of the lens into a prominent position as an element in obtaining pictures rapidly is the optician's doing—not the operator's. Yet I believe no class more highly esteem the instruments they work with than photographers, and none are more anxious to have the best that can be obtained.

The conclusion I arrive at from the consideration of this question is that instantaneous pictures are produced, generally, not by any improved manner of operating, or by the use of new materials or quicker-acting lenses, but pre-eminently in this case by the superior skill exercised in every part of the manipulation. Success in this department is the reward of perfect operating. I do not shut my eyes to the possibility of much improvement on our present position. Pictures may be more rapidly taken by getting more of the light from the object to the sensitive surface—that is, we may improve our lenses. Some years ago, a gentleman proposed using a reflector behind the plate, to get all the light that fell on the prepared surface. We may render our plates much more sensitive. This I esteem a most hopeful direction. Early in the use of collodion the addition of arsenic was recommended to increase its sensitiveness. Has it been quite abandoned? Are wet plates necessarily the most rapid? and are dry ones, as a consequence, slower *because dry?* I would submit these questions just now, and may by-and-by risk an answer. I hold a decided opinion, as the result of close observation; but it will be better to have more room to develop. I have already indicated how much is being done in using more powerful developers. This also I esteem to be another promising direction for advance in rapidity. Let us not forget one thing in the pursuit of improvement in another.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. VI.

The field—sometimes called the field of view—I describe to be an extent or space in which a limited number of objects are depicted by a lens. The field, that is its margin, is in reality always of a circular form, although the plates on which pictures are taken, I may say, are universally rectangular. A focussing-glass or plate, when rightly placed, is on the field. A line drawn across the field, in any direction through the point in which the images of objects are in focus, is always a curve, provided the objects themselves are situated in a plane perpendicular to the axis of the lens, or otherwise situated at equal distances from the lens—or, perhaps, more correctly speaking, when the objects are at such distances that the rays on striking the lens may be considered parallel: thus, when all the objects are so situated, it is evident that the whole field must be of a curved form, and not flat. This is what is meant by the "curvature of the field," which, under these conditions, always occurs; for it has not yet been discovered how to construct a lens the field of which is completely flat. But, when the objects are situated at different distances, the images of those objects will be some within and others beyond the "curvature of the field."

The form of the curvature of the field, in any case, depends on the shape or construction of the lens, and the side of it which may be towards the objects or view, as also on the position of the stop and its size. When a combination is used, the curvature is determined by the arrangement and construction of the lenses, including their forms, the position and size of the stop, and the sides of the lenses towards the objects. It may be stated, as a general rule, that the fields of all those lenses which have the greatest spherical aberration are the most curved—so much so that they are, practically, also very contracted or small.

I will now discuss the conditions which influence the curvature of the field. Taking the plano-convex lens in its position in *fig.* 1, page 85, with its spherical surface towards the object, and using the whole aperture, the field of this lens is more curved than circular, approaching to the elliptical form. Supposing *k a g* to be a circular or rather spherical form, then the form of the field of this lens in that position will be *c a f*. If a small stop be now placed in front of, and in contact with the lens, it is certain the field will be more curved, because the outermost rays of the central pencil, which cut the axis at *b*, are stopped, thus removing the focal point farther from the lens, towards *d;* but in the case of the oblique pencil the outermost rays on *both* sides of its focal point, and which cut its axis at *m* and *g*, are stopped, the result being that the focal point, *f*, is not moved; whereas, because the outermost rays of the central pencil on *both* sides of the axis all cut the axis nearer the lens than the average focal point, the field must be, so to speak, deeper, therefore more curved: thus, when a small stop is used, the field is more curved than when a large one is used. If the stop be now moved away from, and to a distance still in front of the lens, the field will be yet more curved; for the outermost rays on the right hand side of the oblique pencil, A *f* B, will be stopped, and the outermost rays on the left hand side being allowed to pass will come to a focus at *m*, nearer the lens than the former focal point, *f*, thus drawing, in a manner, the margin of the field nearer the lens, and thereby making the field deeper, that is more curved. It may be taken as a general conclusion, under these conditions, that a large stop gives a flatter field than a small one, notwithstanding which, although the field is more curved with a small stop, yet the definition all over is better; because the pencils in the latter case are less obtuse than in the former, or what is commonly understood by a greater depth of focus. If the stop be now placed behind the lens, that is, between it and the focus, and at a certain distance from the lens, the field will be flatter than when the stop was in front; for, contrary to the above case, the outermost rays on the left hand of the oblique pencil, A *f* B, which come to a focus at *m*, are stopped, and the outermost rays on the opposite side being allowed to pass will come to a focus at *g*, farther from the lens than *f*, thus the field will be flatter.

I believe this to be the proper place in which to make a few observations on what is usually called the "radius" of the field, but which is oftener an inapplicable term than anything else, as it is not a correct designation in any case, but that of a circle or sphere, which is scarcely ever the case with the field of a lens. What is meant by the term is this: taking the direction of a ray or pencil from the lens to the focus in any part of the field, and tracing that direction back until it cuts the axis of the lens, the distance from this point to the field is called the radius of that field. It is generally supposed (erroneously) that a field having a long radius must, of necessity, be flatter than one with a shorter radius. Any person who carefully studies the cases I have stated above, will see that such is not the case; for, when the stop is behind the lens (with the plano-convex lens in the position stated), the field is flatter, and yet the radius may be not more than one-half or two-thirds the length of that when the stop is in front.

If we now turn the lens round, with its plane side towards the object, the effects as regards oblique pencils are reversed. The rays which pass the lens at the edge, A, of the oblique pencil cut the axis at *g*, beyond the focus, *f*, and the opposite extreme marginal rays cut it at *m*, nearer the lens than *f;* therefore, when the stop is in front of the lens, the field is flatter than when it is behind: thus, under these circumstances, the field with the longest radius is also the flattest, coinciding with the common impression.

The next point I notice is how the flatness of the field is affected by the stop being near or distant from the lens. When the stop is some distance in front of the lens the field is flatter than when it is in contact, because the oblique pencils are caused to deviate towards the centre. With the stop in front a greater range of objects may be included in focus, because of the superior flatness of that field. If the common single view lens be substituted for the plano-convex in the position stated the effects will be the same, or very nearly so. In taking a picture with a single view lens, several considerations must be taken into account. For instance, if it is indispensable to have the objects in the centre of the field sharp, whatever the remainder may be (in which case a large stop may be used), the convex surface of the lens ought to be towards the object, because the spherical aberration of the central pencils is less than when the lens is the contrary way, which result is what I understand artists to mean by *focus of picture* (not lens); but, if it be required to have other parts of the picture with the sharpest definition, say about half the distance from the centre to the margin, then I would place the flattest surface of the lens towards the object, with the stop in front. If it be wished that

all the picture be as sharp as possible everywhere, with a comparatively flat field, then I would have the lens and stop in the same position, and the aperture of the stop small.

As a general rule when using a single lens, in whatever position it may be put, I consider that the stop ought to be on the same side as the flattest surface, for thereby the flattest field will be obtained, and the best definition up to the margin. The position of the stop in a double portrait combination should be determined by circumstances. It has been asserted that when the stop is between the lenses the field is not so flat as when it is in front of the anterior lens. I rather doubt this; at any rate, if the same size of stop be used in front, or between the lenses, I am convinced that, practically, when it is between, a field of as large size, will be be better defined than when the stop is in front, and that the action of the combination will be quicker. If the flattest surface of the front lens of a common portrait combination be towards the object, then I grant that, when the stop is in front, the field will, in that case, be the flattest.

The *extent* of the field, or its diameter, is limited by several causes:—First, when the definition towards the margin becomes so bad as to be objectionable, that is a limitation of the field. Second, when there is such a diminution of light as to leave the margin too dark, that limits the field. Third, it is also limited by the length of the tube, and the position of the lenses and stop (and also its size) in it. When the stop is between the lenses, the field, in regard to equality of illumination, is always larger than when the stop is in front. It may be stated, and relied on, that in the majority of cases it is more advantageous, taking all things into consideration, to have the stop between the lenses than in front. The principal exception to this is that, in taking a portrait with a short focus combination, the parts approaching the margin appear too distended, too much enlarged, when viewed in the usual manner—that is, with the picture ten or twelve inches from the eyes. But, as this latter point belongs to the subject of distortion, I leave it until I treat on that matter.

ON THE APPARATUS USED IN COPYING DRAWINGS, &c.

By William Tudor Mabley.

[Read at a Meeting of the Manchester Photographic Society, July 3, 1861.]

In designing the apparatus I am about to describe I have had two objects in view:—Firstly, to obtain the means of arranging drawings and other objects in one plane in a correct position in reference to the camera; and, secondly, to accomplish that end by the most simple means. *Fig.* 1 is a side view of the apparatus complete; *Fig.* 2, a face view of that part which supports the drawing to be copied; and *Fig.* 3, a plan view of the supporting table.

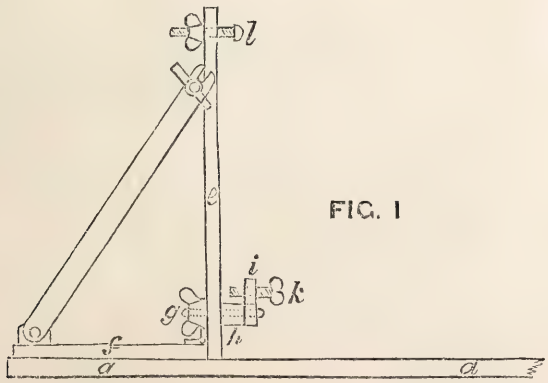


FIG. 1

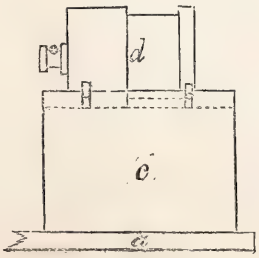


FIG. 2

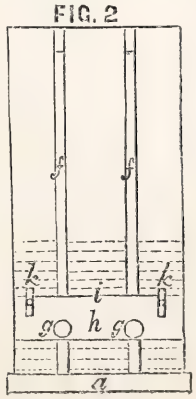
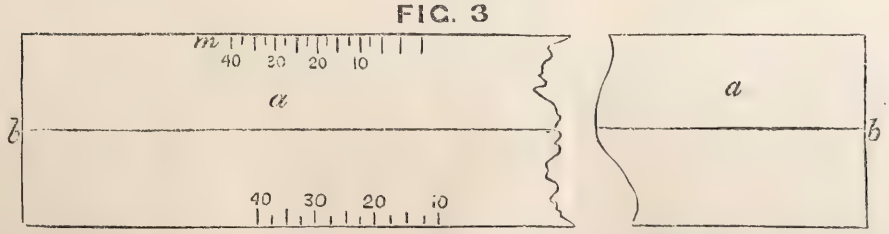


FIG. 3



Here is a table, *a*, which may be supported on tressels or anything that may be at hand without regard to its being level; along this table is ruled a centre line, *b*, which is the key to the correct positions of the object to be copied and the camera. Upon the table *a* is placed a box *c*, on the lower part of which there are marks; and when these are placed on the centre line *b* you know that the front of the box is at right angles thereto. Upon this box is placed the camera *d*, its front being brought flush with a projecting flange; and thus the camera is also square with the line *b*. That portion of the apparatus for holding the object to be copied consists of two parts *e f* at right angles to each other, the base being marked at back and front—which marks being, like the box *c*, placed upon the centre line *b* of the table, will ensure a parallelism between the surface *e* and the ground glass of the camera in a horizontal direction; and as the box *c* and surface *e* are square with the table *a*, a like parallelism in a vertical direction is secured. The surface *e* is constructed by nailing boards against battens placed at the back; and between two of these boards are left spaces *f*, constituting slots. Within these slots are bolts *g* passing through the strip of wood *h*, which may therefore be moved upward or downward, and secured in any desired position. In front of the strip *h* is a projecting part *i*, provided with screws *k*. The camera is always the same height from the table *a*, and always occupies the same transverse position: the centre of the lens will therefore constantly be coincident with a certain point of the surface *e*, and the thing to be done therefore is so to place the object to be copied that its centre shall agree therewith.

Suppose it is desired to copy an engraving: you place it exactly in the middle of a drawing-board, and measure the distance from the bottom to the middle of the subject. If this be ten inches, for instance, and the height of the lens from the table be twenty inches, you know that the drawing-board must be adapted ten inches above the table; you therefore slide the carrier *h* up to that level, and there secure it, a correct parallel position being ensured by the dotted lines ruled upon the surface *e*. The drawing-board is now placed upon the carrier *h*, secured at the bottom by the screws *k*, and at the top by the clips *l*, which may be adjusted within the slots *f*. Upon the table *a* is a scale *m*, the numbers on which determine the position of objects of different dimensions to be copied. Suppose, for instance, you are copying an engraving forty inches long: you place it in a line with the number forty on the scale, and you then know that the reduced image will just cover a plate of the size intended to be used. On the other side of the table is a scale *n*, which in like manner points out the position for a lens of another focus, and other scales may similarly be adapted for plates of various sizes. I have myself made the rectangular parts, *e f*, which carry the object to be copied, so that they can be folded on hinges, the stretcher *o* being capable of removal: in that form they are more easily stowed away when not in use; but upon being adapted to the table they must, of course, be adjusted at right angles by a set square.

In one of the photographic journals I have read a description of an apparatus somewhat similar to that which I have described, but of a much more complicated character. There is no part of this which may not easily be made by any one capable of driving a screw or a nail. It may be taken down and stowed away in a few minutes, and may be adapted in any situation without reference to the levelness of the ground it rests upon. In my own case I use it in a greenhouse, and support it by two bars placed upon the stages.

RE-DISCOVERIES IN THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.—REPLY TO MR. PETER SMITH.

By J. T. Taylor.

That "Scotland still stands where she did," and that I of all others am alive to tell the tale, is matter of thankfulness when I consider the fierce shower of fiery darts with which Mr. Smith has thought fit to assail the northern metropolis. So far as I individually am concerned it will be no arduous task to answer all Mr. Smith has advanced, seeing that his charges are made against the *wrong person altogether*. As was explained in the editorial note appended to Mr. Smith's paper, *I* am not the Secretary of the Photographic Society of Scotland, but merely a private member of that body; and consequently I am no more responsible for the alleged misdeeds of any of its members than is Mr. Smith for the misdeeds of members of any Society, photographic or otherwise, with which he may happen to be connected. What I myself say or do I am responsible for. I will always cash my own paper on demand; but with that of others, although members of the same Society, I have nothing to do.

Having so far cleared the ground I will now proceed to make some remarks on Mr. Smith's communication. That gentleman, while admitting the necessity of a denunciation of photographic re-invention, denies the right of its being administered by a Scotchman; because that Scotchman was supposed to be Secretary of a Society which had, according to Mr. Smith, made itself notorious for its patronising second-hand discoverers. Than this the "power of logic can no farther go;" hence I leave this proposition as it stands, satisfied that the *reductio ad absurdam* will be fully developed as soon as it passes under the eye of an intelligent reader. May I, in passing, ask how it happens that Mr. Smith, feeling as he does the necessity of making such a denunciation, and possessed of such facts, has been so long in entering the field? Now, I would here beg to deny *in toto* that the Photographic Society of Scotland has "made itself notorious for its patronage of second-hand discoverers." I at once admit the accuracy of the four cases adduced by Mr. Smith; but these are perfectly insufficient to establish such a character for a public Society. And even these may be capable of explanation: one of them I know to be so—the one in question being Mr. Macnair's discovery that wort acted as a preservative coating for a collodionised plate. Granting, as Mr. Smith says, that it *had* been previously brought before the notice of the Society on three different occasions, that is no reason why Mr. Macnair might not be an independent discoverer of it. I presume neither Mr. Macnair nor the Council of the Society claim that this was the *first* discovery, but that it was *a* discovery, so far as Mr. Macnair was concerned; at least I suppose this to be their position. Mr. Smith is pleased to be witty at the expense of the Council, because of the bronze medal awarded to Mr. Macnair. Well, I daresay the Council will be perfectly ready and willing to defend its own acts; but, as I have already said, I have nothing to do with the matter, not being responsible for its actions. These are all the remarks I deem it necessary to make at present, reserving anything further for another time, should it be necessary.

P.S.—What does Mr. Smith mean by *my late sneers against Englishmen?* I suspect Mr. Smith has got his brain "soused" into the dense fog about which he writes so feelingly.

ON THE BEST MEANS OF AVOIDING THE ORDINARY FAILURE IN THE MANAGEMENT OF THE WET COLLODION PROCESS.*

By M. Martin,

Professor of Natural Philosophy at the College of Saint-Barbe.

Two years ago I undertook a work, previously commenced, in which I resolved to seek the causes of the accidents that photographers meet with, and the means of avoiding them. I am glad to have successfully attained this object, and it gives me pleasure to communicate the results of my labour to the French Society of Photography.

In the first place one should understand well the nature of collodion and the elements of which it is composed.

I shall have little to say of ether, as it may be obtained from the manufacturers of chemical products sufficiently pure and refined at 62 degrees. It is slightly alkaline when it is newly prepared and has not been exposed to the action of light in a vessel not filled.

The alcohol that I use is of forty degrees, which may be easily obtained. The cotton varies most, the variation depending on the conditions under which it is prepared.

* From *Le Bulletin de la Societié Francais Photographique.*

There are four kinds of nitrogenised cotton, which are—

First—Cotton with five equivalents of hyponitric acid (gun cotton): it only dissolves in methylacetic ether; and the solution which results from it leaves by the evaporation of this ether a pulverulent sediment, useless for photographic purposes.

In a mixture of ether and alcohol this cotton seems at first to dissolve; but, after standing, the whole settles at the bottom of the bottle in a gelatinous form.

Second—Cotton with four equivalents of hyponitric acid (soluble cotton) is the best for photographic use. It dissolves in methylacetic ether, and in the mixture of ether and alcohol: this last solution leaves, by evaporation, a transparent film, more or less cohesive, according to the quantity of ether in the mixture of the two liquids.

Third—Cotton with three equivalents of hyponitric acid (powdery cotton), soluble in the same liquids as the previous ones, and also in acetic and in dilute nitric acid. The film left by evaporation is always opaline, and has no cohesiveness, owing to the nature of the cotton, and also because this cotton requires in the mixture of ether and alcohol a larger quantity of alcohol than the preceding kind of cotton.

Fourth—Cotton with two equivalents (of hyponitric acid) is soluble in water, and no longer leaves a tenacious film upon the glass: upon being immersed in water this film completely disappears.

These different kinds of cotton are seldom obtained of a nature so decided as those that I have just described: those met with in common are generally mixed in various proportions.

In 1852, in an address presented to the Society for the Encouragement of Arts and Sciences, I described a means by which cotton entirely soluble in a mixture of ether and alcohol might be obtained with certainty, and the method has been followed from that time by one of our first manufacturers of chemical products, who has assured me that he has always obtained the best results.

Since that date Mr. Hardwich has studied deeply the nature and manufacture of *soluble* cotton by the mixture of sulphuric and nitric acids. I carefully repeated all his experiments. At first I experienced a want of success, owing to the monohydrated nitric acid that I was using not containing enough of hyponitric acid; but, when I learned that it is this last-named acid which is the true transforming agent by which the ordinary cotton is converted into nitric cotton, I completely succeeded in obtaining the different varieties of cotton that I wished to study according to the directions of this English writer.

The only inconvenience arising from the presence of the first kind of cotton (gun cotton) is that we are unable to tell the real quantity of soluble cotton introduced into the collodion, and of giving it the tendency to peel off.

The third variety (powdery cotton), producing an opaline film, deficient in tenacity, can be easily eliminated from the soluble portion by beating the tufts between the hand, and, at the same time, blowing them before their introduction into the mixture of ether and alcohol.

The fourth kind, soluble in water, is not met with except in samples badly washed; but it occurs in collodion already prepared when containing alkalies.

Alkalies possess the property of removing from the dissolved cotton a certain quantity of hyponitric acid, and of causing it to pass successively from the first to the fourth variety. To their presence is due the only alteration which the collodion can undergo in becoming old when in well-stopped bottles not exposed to the light.

This last essential element of collodion is the soluble iodide added thereto.

Iodides have a great tendency to combine with a certain quantity of oxide of the same base so as to form an oxy-iodide.

Oxy-iodides soluble in water are decomposed by alcohol at forty degrees if the oxide be not soluble in this liquid. Itis the case with cadmium and zinc. Potash being soluble in alcohol, the oxy-iodide will dissolve, and the potash will react upon the cotton so as to cause it to undergo the above described transformations.

Thus collodions iodised with iodide of potassium are always unstable; and the photographer desirous of avoiding every cause of failure ought to banish it, as well as every iodide having a base the oxide of which is soluble in alcohol, absolutely from the composition of his collodion.

There still remains another reason why the iodide of potassium should be proscribed. It is that bromides often enter into the composition of collodion, and then by double decomposition it forms bromide of potassium almost insoluble in ether and alcohol; so that a precipitate is formed which is difficult to collect at the

bottom of the bottle, and which causes those little white spots upon the proofs which have discouraged so many operators.

The iodide of ammonium so easily loses its excess of ammonia in becoming yellow that it causes but little inconvenience.

The facts which have been previously mentioned being well understood, collodion may be made in the following manner:—

In 5½ ounces of alcohol at 40 degrees dissolve 75 grains of iodide of cadmium and (if bromides are used) 6 grains of bromide of cadmium. Let the solution stand, which will allow a gelatinous sediment of oxide of cadmium to be precipitated; then filter, and put it in about 12 ounces of rectified ether at 62 degrees. If the ether be not acid the mixture will remain uncoloured. A drop or two of tincture of iodine will give to it a pale straw colour; then 75 grains of pyroxyline, well freed from powdery matter, may be dissolved therein. After a few minutes shake it and let it stand.

I do not pretend to give the absolute proportions, but a certain way of preparation. The proportions vary a little with the habits of the practitioners, who prefer some a thin others a thicker collodion. The preceding mode of operation has for its object the removal of the oxide from the acid that contains it, and therewith first the fogs and the grey *tones*, and afterwards the instability of the collodion caused by its reaction upon the cotton.

Note.—If one employs with the mixture iodide of cadmium and of ammonium, which is a little yellow, the addition of free iodide becomes useless.

I use crystallised nitrate of silver for my bath, and, if needful, dry it with a sand bath in a china capsule. The fusion of nitrate of silver is always a dangerous operation for the ultimate success, in consequence of the possibility of a slight decomposition by the organic matters which may get into the crucible. Dissolve from 600 to 750 grains of nitrate of silver in eight ounces of water, and put in a few drops of a filtered alcoholic solution of cadmium, so that there may remain a little in excess of iodide of silver undissolved; then add the eight ounces more of water necessary to complete the bath; part of the dissolved iodide is again precipitated; again filtered through the same paper, and the bath is then ready for use.

The developer must fulfil several conditions:—

1st. Only operate upon the nitrate of silver in the film on those parts where the light has acted upon it and not in the body of the liquid.

2nd. Penetrate the film so as to act on every part that has been exposed to the action of the light.

3rd. Only commence to operate at the end of one or two seconds, in order to allow the operator to empty the liquid upon the plate without marks being caused by any check in the flowing of the liquid.

Used in the following manner, pyrogallic acid well fulfils these conditions:—Dissolve fifteen grains of pyrogallic acid in three drachms of crystallised acetic acid and one drachm of alcohol at forty degrees. This solution will keep for a long time in a dark place, and can be used as provision for an excursion. In order to use it, add one drachm to two and a-half ounces of water (not calcareous): distilled water is not necessary when one is assured by trial that the solution thus obtained does not become yellow in about twenty-four hours. Prepared by the preceding method, this solution serves completely to develop an impression without the appearance of that black mud, which is owing to the reduction of the silver in the body of the liquid, and to the detriment of the picture.

If it be necessary to strengthen too weak an impression, use the same liquid, with the addition of a few drops of nitrate of silver of about thirty grains to the ounce of water.

Certain conditions of light compel the operator to develop with sulphate of iron. In this case I dissolve, first, about three ounces of sulphate of iron in eight ounces of water; and, second, one drachm of acetic acid and two drachms of alcohol in eight ounces of water. I empty this second solution into the first, and use the mixture as a developing agent. For instantaneous impressions, I substitute for acetic ether nitric ether alcoholised—known commonly as nitric ether. In this case the solution of iron becomes very brown, and gives a sediment in twenty-four hours, which has only to be filtered.

These baths of iron filtered at each operation will serve several times; and if it be found that they give an abundant precipitate in their mixture with nitrate of silver from the plate, it is owing to the light being too weak for the iron bath—in which case dilute the latter with water before using it.

The fixing is performed by means of a saturated solution of hyposulphite of soda in the same way as the development.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. VII.

Jerusalem—Supply of Water—First Photograph of the City—View from Mount of Olives and from Scopus.

It would be quite useless to inform my readers *how* I darkened my operating-room, as I may not again do so precisely in the same manner. Each occasion requires its own adaptation. I rather prefer to work by artificial light for several reasons: it is more manageable—the same arrangement does for day and night—and, above all, it is so perfectly reliable: there is no chance of being deceived with bad yellow glass or paper which is *not yellow*. By using artificial light one can be certain there is no *white* light admitted into the room. After all openings have been shut, and the candle or lamp is extinguished, the operator should sit down for a few minutes before he risk to commence. The probability is that, after he has supposed every opening by which light could possibly penetrate *has been* closed, there will remain several chinks and seams—it may be little more then perhaps pin-holes, but quite sufficient, if neglected, to utterly unfit the room for photographic operation, particularly for the preparation of dry plates. The frequent washing of these expose them so much that, if there be any diffused white light in the room, they are almost certain to be spoiled; and, again, any light they may get during preparation tells so much more if they are long kept before development. I have seen many operating-rooms in daily use for wet plate work in which I am sure no one could risk sensitising and washing plates to be kept for some time. But I did not intend to say a word on that subject here, further than that I succeeded in making my room dark enough to suit my ideas after a good deal of pinning and tacking, yet so that I could open all or darken again in two minutes.

I have elsewhere given an account of my usual plan of sensitising and washing. I proceeded here as usual. The water in Max's well I found very good, though contaminated with *lime* salts; but the people of Jerusalem do not look upon that as a photographer does: lime is no contamination; it is put in intentionally to keep the water sweet. In my last, when describing the Syrian houses, I should have described the provision that is usually made for a supply of water, particularly as that is rather of more importance to the photographer than anything else about these houses. Rain is the principal and best source for the supply of water in Eastern cities. In such countries as Palestine there are few rivers or springs of living water. The consequence is that water is one of the things men desire to possess as of the highest value. A well is a mine of wealth to the fortunate possesser. Rain is the chief and best source of water supply for Jerusalem. There is but one good well—the well "En Regel," below Siloam. A grand one it is: it never seems to fail. All last summer, though it was an unusually dry season, every day, from early dawn until dusk, half-a-dozen strong, half-naked Arabs, kept ever plunging their buckets into its inexhaustible store. The Arab brain has not yet fathomed the principle of the pump. As a matter of course, as they do not comprehend how it can draw up water, they think it must do so by *magic*. When the builder of the alms-houses for poor Jews, which Sir M. Montefiore has recently had erected over against Zion on the side of the Valley of Gehinnon, put down a pump he had brought from England, the Arabs at first thought him a fool to expect that water would come up a narrow pipe without a bucket or rope. The pump was, however, set to rights; of course the water did come; and, as a consequence, the architect and builder ceased to be a "fool;" but the poor ignorant Arab remained doubtful whether his being able to do feats of magic proved him to be a better or a worse man.

I have referred to the well in the house: it is so named, though, as we use the word, its being so designated is a misnomer. They are not wells, but *cisterns* in which the prudent householder stores the abundant supply of water which falls on his housetop during a few weeks of the year, and which will, if properly collected, and used with reasonable care, furnish an abundant supply for all the year. When a man begins to build a house, the well or water cistern is first made, being frequently cut out of the rock, and it is always under ground. It is carefully and strongly built, and covered with a hard and close-grained cement. It is arched on the top, leaving an opening through which the water is drawn, and by which also a man can descend for the purpose of repairs. Over this, then, the house is built. The well is, in fact, in the cellar of the house. The top of the house is so constructed that the water

all runs by connecting channels to the "well." Nowhere in Syria need there be the least difficulty about a good and abundant supply of water, if *all* the houses are everywhere built as I have described. But wherever there is any other source of supply, however inferior in quality, or uncertain in amount and constancy, men will trust to it: they are, in consequence, frequently perishing for want, and never half as well off as they might be if the winter's rain were but properly stored as a provision against the summer's drought.

I did not get my plates ready till after four o'clock. I was anxious, however, to take a picture the first day I was in Jerusalem: so off I went about five o'clock, after I had done partial justice to dinner, which had been preparing simultaneously with my glasses. Enthusiastic photographers are very apt to forget all about dinner summonses; and it is perhaps as well—though they do not always think so—that sensible housekeepers are as decided in insisting that roast beef should not be *over-exposed* on the table as they have taken care it should not be *under-done* in the kitchen.

By the time I had my camera adjusted the sun was getting low and the shadows were becoming long, reminding one of home as compared with the nearly vertical light which prevails in such countries. I exposed for two minutes with the middle size of stop, about half-an-inch in diameter, in my fifteen-inch-focus lens, and same time for the stereos. I have already mentioned that I took the 8 × 10 and stereo. pictures at one time, using one stand for the three cameras. In my next I will give a full description and a drawing of the arrangements.

I took two complete copies. These I developed the same evening, and they turned out as well as I could have expected. Those who have seen the published views will recognise it under the title of *Jerusalem from the North.*

I again sensitised before going to bed. This practice I proposed to carry on daily, developing each day's pictures the same evening, and preparing for the next day. I soon found it would not suit in practice, however well it might look on paper. It was too hard work, and there was no need for such hurry. Most of the objects had been pretty much as they were for a very long time, and they would all accommodate me by remaining a few days longer, till I had caught their shadow, without endangering my health or life, which I soon perceived this day-and-night working would shortly do. I resolved to betake myself next morning to the Mount of Olives, and to do the grand view of the Holy City, obtained from any point on its summit. Olivet is not properly a mount, but an elevated range extending along the whole eastern side of the City, with the so-called Valley of Jehoshophat lying between it and the heights on which Jerusalem stands. Three distinctly marked eminences are easily made out. On the central of these stands the Church of the Ascension, built on the spot from which tradition says our Saviour "was parted from his disciples and carried up into heaven." From this central point a fine view of the city is obtained. It "comes in" in two with a lens which covers well. The spectator is a considerable height above the highest parts of the City, and it lies as it were nearly at his feet—every important object being distinctly seen. Passing to the southern shoulder of the Mount of Olives a better view is obtained—more angular, and bringing in a little of the south side of the city wall. It makes a much finer composition, and has, perhaps, but one drawback—the Garden of Gethsemane is not seen at all. Another objection, also, is that the view becomes lengthened, so that three plates are required to include the whole City within and without the walls. Again, moving northward to the third elevation, designated Olivet, a very good view is also obtained, finely drawn together, and with a more varied foreground than either of the other views. Farther north still, and a little west from what has been called Scopus, an excellent picture of the Holy City in one view is obtained, showing the northern and eastern sides of the City wall. In each case, the elevation on which the spectator stands is such as completely commands the whole City. The near parts being in all the lower—the ground rising as the objects recede. Those travellers who approach Jerusalem from the north by the Damascus or north road, get this grand picture as their first view. It bursts on us at once; and, even after one is familiar with every object on it, the impression produced on the mind is such as can never be effaced. No wonder that those who have come far, and to whom this is the realisation of a life-long desire, should lay aside for a time the prudential considerations which stifle the expression of strong emotion. It is a study for a psychologist to observe, on such an occasion, the various manners in which each nationality expresses the full joy of a grateful heart. And how truly gladdening it is, too, to look on, while Jew, Moslem, and Christian together join in thanking the "One God and Father of all" that their eyes at last look on what all recognise as the Holy City!

I return to my camera on the top of Olivet, and while I expose a few plates I will chat a little more with my readers about the City which lies before me, and also embrace the opportunity, as I have before mentioned, of taking a picture of my arrangements of cameras, and giving a description of their *modus operandi.*

LEAVES FROM THE DIARY OF A LATE ENTHUSIASTIC AMATEUR.

Edited by Sydney Sunshine.

When the late Thomas Hood compared enthusiasm to turtle soup, asserting that the *mock* largely preponderated in quantity over the *real,* he could not have had the remotest apprehension of photographic enthusiasm, because I think *that* is in most cases (I know it was in mine) the real genuine article. What else could have lured me, like an *ignis-fatuus,* through all the various complicated processes—wet and nasty—dry and sticky? Calotype, waxed paper, and collodion—preservative, honey, treacle, syrup (oh! the sweet coats—claret, blue, mulberry, &c.—morning promenade—I spoiled)—culminating in raspberry vinegar and gin and water! What "a nuisance" the servants voted me! "Another of Mister Augustus's messes!" would the laundress exclaim. "It's my private hopinion"—I heard the venerable butler soliloquise—"It's my private hopinion that Mister Augustus 'll pisin hisself some of these days with his 'sperimentising."

How well I remember all the fixes and failures I waded through, all the insults I endured, and all the scrapes I got into in the laudable pursuit and practice of our noble art! How well that one bright hour in a whole week of wet ones, when I made that journey to the Ruins of Mildew Abbey (two hundred miles) to get an example of the Anglo-barbaric period with which my rich antiquarian uncle wished to illustrate his lecture at the Tiptopham Athenæum! How well I remember, after adjusting the camera and uncovering the lens for three-quarters-of-an-hour's exposure (those were the early calotype days, dear reader), strolling away to meditate and dream o'er the days that are gone and imagine the scenes that had been enacted within those walls—

> "to re-people with the Past,
> While of the Present, there was still for eye,
> And thought, and meditation chastened down,
> Enough, and more, may be, than I had asked or sought."

And then, when "time was up," returning to put the cap on the lens and finding a Roger Chawbacon of a clown stooping with hands on knees in the position of a schoolboy in the game of leap-frog, his nose and little red eyes peering into the lens in the vain effort to make out "what wor going on hinside." My picture was of course spoiled, and, alas! I fear my temper. With what gusto did I not thrust him aside, muttering benevolent wishes—not loud, but deep! With what relish did little Snap-dragon (warranted to kill *any* number of rats in *no* time at all) fasten on to the bottoms of his corduroys!

Few but those who have worked with the woolly-paper processes can tell the delight with which the collodion process was hailed, more particularly when it was made available in the field.

Blessed be the man who first invented tents—I mean photographic tents! Of all the other varieties of tent, ancient and modern—the Arab tent, the military tent, the gipsy tent (whose joys form such a card in opera choruses), the wigwam, the gold-digger's tent, &c.—a ponderous tome lately given to the world by a learned Professor of one of our Universities, after many years of painful labour and research, is completely exhaustive. But dark tents! does any one know the name of the transcendant genius who invented them? Ought he not to have a testimonial raised to his honour? Have we not had testimonials raised for more questionable objects? How much that is charming in wild and rugged landscape do we not owe to him! But their use is not unattended with difficulties and dangers to the tyro. To such my advice is, do not estimate too highly "lightness and portability," because those qualities are too often associated with inefficiency. To those about to purchase a peripatetic edifice of black and yellow, weighing only so many ounces, I humbly offer the advice of my illustrious contemporary, *Punch,* to persons about to make an investment of another kind—"Don't;" nor be too partial to the use of tripods for its support. A strong, solid box, which will hold all your paraphernalia, with a hole made in the centre of the lid, is a far better thing to screw the table of a tent down upon. It offers a more solid resistance to wind in a rough or open country, and can be left to itself with

safety. A camp-stool, or a plate-box, will reduce you to the proper height. The arrival of my first tent from Messrs. Slidedark and Co. was a red-letter day in my photographic career. I am not gifted with second-sight, and had not the most infinitesimal section of a peep into futurity. How we admired its graceful proportions when erected in the back parlour! Unsoiled, unstained, with a refreshing odour of the cabinet-maker's workshop yet lingering around it! How some one I know got in it and shook a merry little head running over with curls about when I followed to give sage explanations! I have since used tents of all kinds with pleasure and advantage, but still look back to this my first love with mingled feelings of enjoyment and regret.

When travelling in Scotland, I essayed to use it for the first time in an endeavour to bag that magnificent panorama which spreads itself out at the tourist's feet in crossing the hills both to the north and north-east, a few miles from Aberfeldy. Who that has ever gazed thereon can forget it! I took up quarters at the little village inn, which lay nestling under the cool shadows of one of the mountains. The first day proved unpropitious, wet and *misewable*. Chafing with inaction, I sought refuge in the literature of the hostelry, which proved to consist of a *Johnson's Dictionary*, an old *Family Herald*, and a *Ready Reckoner*. However, my imprisonment did not obtain any sympathy from the inhabitants, who were evidently glad to have so fine a bird in their cage.

Bright was the morn of the next day, when, after a Highland breakfast, I sallied forth with my retinue. I had hired three sturdy gillies, with bronzed faces, and a cake-fed-looking Highland lad, to carry my cases, &c.; and as we slowly and laboriously wound our way round the hill-side, the sun came out cheerily, while the lark sung loud at Heaven's gate, and things looked auspicious and inspiriting. When reaching some considerable altitude there is always a feeling of loneliness steals over the wayfarer which it may be imagined is the result of the intense tranquillity that prevails. But the sensations experienced are usually agreeable, and the sense of hearing becomes acuter. Now and again, the sharp crack of a rifle breaks the stillness, or a heron starts up almost at your feet, wheeling in circles overhead, screaming sharply the while. Deer are seen stealing out of the coverts, and the huge fissures in every crag are purple with mountain-heather.

We selected a site for the commencement of our operations—unpacking, erection of tent, and so on—about half-way up the hill-side, at an accessible distance from which was a little mountain tarn, sparkling with the necessary water. But, after getting all in readiness, as will often happen, the weather, which had been gradually lowering, became so overcast and threatening that we were fain to sit down to the luncheon we brought with us. This passed over, but not the clouds; and, to soothe my impatience, I lit my cigar, and lying down on the blooming heather, meditated on the vanity of human pursuits in general, and photographing in particular.

The day dragged through, though clouds kept out the sun; but towards evening I was pleased to feel the wind rising—in fitful gusts at first, then more steadily—and the banks of clouds began to "move on." The mist below began to whirl about in eddies, revealing through and beyond them masses of dark green firs, upright and regular, looking in the dim distance like battalions of riflemen standing in rank. Gradually, as the wind rose, the mist rolled itself up and away, like the curtain of a theatre, revealing one of the most superb tracts of country at your feet, dotted with soft, quiet hamlets, shady woods, shining patches of water, rich corn fields, and beyond all, the moors stretching away in undulations, like "mighty billows of a granite sea."

Presto! the camera was speedily got into position, and a plate prepared. The thing looked so splendid on the focussing-screen that I began developing with almost trembling eagerness. This plate—no matter from what cause—was *a failure*. Another was speedily ready and exposed, and the development successfully commenced, when one of those sudden and tremendous gusts of wind—not uncommon there—after buffeting the tent a good deal, got fairly the mastery by a *coup de main*, getting under the bottom of it and uprooting the whole at one fell swoop, sending me enveloped in it with all its contents, rattling over and over down the steep hill side. Every yard accelerated the impetus, and the speed with which it rolled over and over wound it up into a tolerably compact mass. Blinded, cut, half-smothered and stifled with nitrate bath, collodion, developing and fixing solutions, bottles and measures—of which I was the centre—I could yet hear the three gillies rushing frantically down the steep at full speed, like the same number of witches in Macbeth, screaming and screeching the wildest Gaelic, and tumbling over each other in the vain effort to stop the rolling mass—which never did stop until it reached the bottom of the hill!

Only those who have been present at the unrolling of a mummy can picture the process of my disinterment. I emerged half dead, wholly disgusted, and gazed around me in a state of considerable spherical aberration, combined with as large an amount of chromatic dispersion. The shades of evening were falling fast, and not unwelcomely, as I reached my inn; and making my entry by the back entrance for fear of gazers, my blackened and grotesque appearance frightened the servant maid, who scampered off evidently thinking she had at last seen the "warlock o' the glen." I immediately hurried to bed, replying to the inquiry of "boots," as to when I should be called—"*Next week!*" and seeking my pillow, let "tired nature's sweet restorer" steep me in oblivion.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

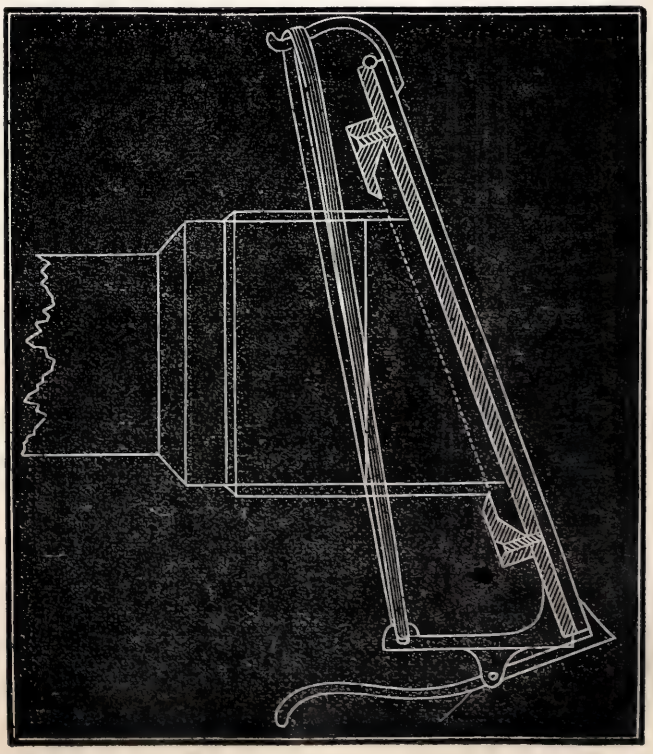
[Notice.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

No. V.

INSTANTANEOUS SHUTTERS.

In the last number of The British Journal of Photography a notice was given of M. Mc-A. Gaudin's reclamation of the invention of the Instantaneous Shutters we were the first to call attention to, in "Letters to a Photographic Friend" in the previous volume, as well as at page 105 of the present volume of this Journal.

Mr. Thomas Ross has recently drawn our attention to what he calls "*the Great Grandfather*" of the flap shutters employed by Murray and Heath, Fry, Dallmeyer, and Gaudin, viz., the flap that was used to cap the "reversing prism" in the old days of Daguerreotype practice, it being "The Common Plan," as Professor Huxley would call it, to which all the various *modifications* are referable. At the same time Mr. Ross showed us the model of an instantaneous shutter on this plan, that had been constructed some years back, by a member of his establishment; and as this has some good points we shall describe it. In the first place,

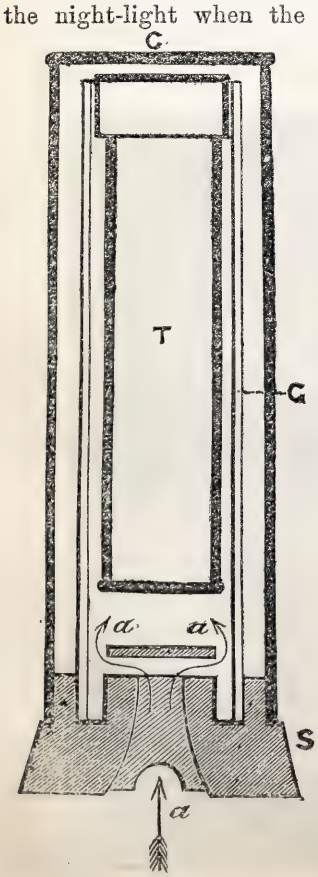


the tubes, by which the shutter is attached to a twin lens camera, are cut off obliquely, after the manner in which it is the custom to cut a German sausage, or like a coal-scuttle—the object of this being to ensure the flap shutter falling "*home*" when the camera is pointed downwards, as the longest dimension of the tube is placed undermost, therefore in a position calculated to meet the shutter in its fall, after it has been raised for the exposure, *unless* the lenses be pointed downwards at too great an angle. These connecting tubes are soldered to separate plates of brass that work to and fro in grooves, in the back of the base-plate, to which the shutter is hinged, so as to allow of the lenses being separated at the discretion of the operator. The centre of the base-plate is cut away, so as to form an oblong aperture, and to its front upper edge is hinged the brass flap or shutter. To this shutter an instantaneous action is imparted by means of the following contrivance:—At one end of its upper edge a curved brass lever projects, over which is stretched the loop of an india-rubber band that is fixed to an arm attached to the under edge of the back of the base-plate. The shutter is held down over the apertures of the lenses by means of a trigger; but as soon as this is freed the elastic band re-acts, and pulling the lever downwards it elevates the shutter; but at a certain point it slips off the lever, and the shutter, being thus freed from its action, falls back over the lenses: in its course it strikes and passes over the catch of the trigger, which again retains it in close contact with the base-plate, so as to exclude all light from the lenses. The action is very rapid.

THE PHOTOGRAPHER'S LAMP.

Those who employ dry plates when on a trip away from home must have felt the want of a compact form of yellow shaded lamp, by which they could safely change the plates in their camera frames, or develop the pictures they had taken during the day. Having personally experienced the misery of working with a candle shaded by several thicknesses of yellow calico, we contrived a portable lamp for a recent trip to the picturesque shores of South Devon. In the first place we selected a cylindrical lamp glass of yellow "pot metal:" to this we had fitted a turned wooden foot, so constructed that whilst it admitted air to a night light placed inside the shade, it should not allow any stray ray of light to escape, this being effected by drilling the little pedestal on which the light was placed with a system of air passages at right angles to each other—one set being immediately under the light, the other set in the base of the wooden foot. Within the yellow glass shade a tin case, to hold a stock of night-lights, was fitted, any jarring being prevented by means of a tuft of cotton wool: the lid of this stock case formed the water dish for the night-light when the lamp was in use. To protect the glass when *en route*, or not in use, a tin cylinder was fitted over all, so as to wedge tight on to a slightly conical rim turned on the wooden stand.

The arrangement will be perfectly intelligible by aid of the annexed diagram.



C The outer tin cover or guard.

T The inner tin stock case.

G The yellow lamp glass.

S The wooden stand perforated with air holes *a a a*.

The dimensions, when packed, are nine inches long by three inches in diameter. This apparatus is soon unpacked and put up again, and it answers its purpose admirably.

STEREOGRAPHS.

Illustrations of Scenes in Madeira, taken by Russell M. Gordon. London: Murray & Heath, Piccadilly; Horne & Thornthwaite, Newgate Street.

The island of Madeira cannot fail to be more or less interesting to almost every Englishman, frequented as it is by those suffering from, or threatened with, an attack of that fatal malady, consumption; and there are but few amongst us who have not some friend or relative who has been or is about to go there. This alone would render the series before us popular; but, in addition to the adventitious attraction of sentiment, many of the scenes are in themselves highly beautiful, and others curious. The execution of the pictures is also such as to command praise, the operator being evidently a skilled hand. We propose describing some of the more remarkable amongst these specimens; and first we notice the

View on the Seixal Road—a subject as curious as it is picturesque. The whole island is of a basaltic formation, and is deeply indented with narrow valleys and water-courses: the elevation is also very considerable. In this view the spectator is upon a narrow pathway, high up on the almost perpendicular rock near the coast. A promontory of the rock juts out in the middle distance, across which is seen a small bay, with another projection beyond. The rock itself is worn and furrowed, and clothed irregularly with vegetation of humble character. The narrow pathway, only some three or four feet wide, is, a little beyond the part where the operator is situated, protected by a sort of artificial screen from the influence of a mountain stream, which falls perpendicularly almost in a mass of fine vapour. At the entrance of this covered way a man is seen contemplating the prospect beyond. This slide is novel, picturesque, and beautifully executed.

Loo Rock and Pantinsh is the title of an instantaneous marine view, with a calm rippling sea, and on which is seen a vessel at anchor, a few light streaky clouds, and plenty of atmosphere. The large rounded stones on the beach tell of storm and tempest, in spite of the present calm.

Parta da Cruiz Bay is another "instantaneous" picture. The surf rolling in on the low shore, the partly wetted stones of the beach, and the collection of small houses congregated at the foot of the huge mass of inaccessible rock, present a vivid semblance of the reality.

In the Peak Fort we have a scene of quite a different character. The fort, standing alone on the summit of an eminence, is the centre of attraction to a numerous group of residences built around the base of the hill; and these seem to belong to people well to do in the world, seeing that they appear commodious, and are mostly encompassed by gardens, in which there is a sprinkling of tropical trees.

Going to Town is the title of an interesting slide. A sort of roadway (flanked on the left by a high wall, against which the shadows of a row of trees on the right are cast, chequering it in grotesque and suggestive forms), is occupied by two vehicles, in each of which is seated a lady and gentleman. These vehicles are without wheels, and appear to be constructed of basket-work. Their form is something approaching to that of the well-known children's perambulators: they are propelled from behind by two men, and seem to be made to run on an iron frame, sledge fashion. Against the wall one of these vehicles is turned up on its side, and upon it a man is sitting, with his back against the wall, taking a quiet nap. In the distance a tree of strange aspect is visible. This slide is one very characteristic of the peculiarities of the locality.

One of the most interesting of the whole is labelled Lazzaroni and Water Carrier. The subject is admirably grouped and executed, and forms a thorough picture. On the left is a flight of stone steps, on the lower of which stands the graceful water-jug, close by which is seated a female at work. She is dressed in a striped skirt and loose boddice or mantle, and has a singular-looking peaked cap on her head. Close behind her is an arch, over which are trained roses and various creepers. Through the arch portions of a well-kept and beautiful garden are seen, with many a singular plant. The paths are constructed of small rounded pebbles, placed as a paving, in *regular* disorder. Leaning against the right side of the arch, half imbedded amongst the flowers, a male figure in picturesque costume is seen, guitar in hand, and apparently serenading his *quasi*-fair companion. The costume of the man consists of shirt and drawers, terminating above the knees with loose jacket without sleeves; and he also wears the same kind of pointed cap as the female. The legs and feet are entirely bare. He is by no means ill-looking, and his attitude is graceful

and easy. Above his head are two blossoms of a trumpet-shaped flower, depending from the arch. This is a highly-pleasing composition.

COTTAGE AT SANTA ANNA.—This, though interesting, as all illustrations of local habits and customs are, is not nearly so picturesque as the last-named slide, the numerous women and children being inartistically grouped; but one receives an admirable notion of the character of a native residence. The rocky ground, the luxuriant foliage—amongst which are large shrubs, bearing the beautiful trumpet-formed flower noticed in the last—the high-pitched thatched roof of the wooden cottage, with unglazed windows and external gallery, to which access is gained by an outside step-ladder, are all elements of a pleasing subject, which the figures alone somewhat spoil, from their artificial arrangement.

THE SCREW PINE-TREE AT THE DEANERY forms the centre of a scene in the Deanery garden, in which three ladies and a gentleman are well grouped, and which—besides the special botanical lion named—contains others but little less interesting.

PEASANT WOMEN, of which there are two—one seated with a distaff in her hand, and the other standing with a water-jug in her arms—seem to be enjoying the deep shade of a thick wood.

SCENE NEAR THE PRIA is an extensive view of some elevated district that is unlike any that we have seen. Patches of cultivated ground are scattered amidst bare rocks. In the centre is a square stone hut, with pyramidal thatched roof, half covered by a luxuriant vine.

There are views of several churches and cemeteries, all more or less interesting; amongst which we may mention specially the PROTESTANT CEMETERY and the MOUNT CHURCH. This last is particularly pleasing as a picture. The church, half hidden amongst the trees in a sort of amphitheatre near the mountain-top, forms the artistic focus. On the long grass in the foreground a youth is reclining at the feet of a female seated in a chair and with a distaff in her hand, while a man in highly-picturesque costume is standing, and in conversation with the others. On the right a fine Deodara pine, with its gracefully-sweeping feathery boughs, is beautifully depicted.

The VIEW NEAR THE PICO RUIVO is particularly worthy of being mentioned. Located at an elevation of about 6000 feet above the sea, the mountain runs into grotesque and broken peaks, traversed by deep ravines, clothed on the sides with some stunted brushwood of unfamiliar aspect. The atmosphere and *chiaroscuo* of this slide are exquisite, the whole being vigorous and artistic in an unusual degree. There are several illustrations of some singularly-formed gigantic rocks, standing out perpendicularly from the surrounding ground. To describe them would be impossible. We must, therefore, content ourselves with merely giving the following list, viz.:—ROCK IN THE RAVINE OF SAO VICENTE; CHAPEL (in a rock) of the same locality; ROCK NEAR PICO RUIVO; and, lastly, HOMEM-EMPE. As a concluding piece we must mention an "instantaneous" view of H.M.S. EURYALUS SALUTING IN FUNCHAL HARBOUR, in which the ripple and smoke from the gun are both well caught.

We can conscientiously recommend our readers to procure this series, which, from its novelty, cannot fail to afford much pleasure. The whole are well executed, both as regards the negatives and printing, and may be pronounced an important addition to any collection.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on Wednesday, the 3rd instant,—Joseph Sidebotham, Esq., in the chair.

Mr. Sheard was elected a member of the Society.

Mr. Hooper presented the Society with three prints, from negatives 20 by 15, by the waxed-paper process, which, through that gentleman's skill and attention, afforded most beautiful results. The lens with which these negatives were taken was a "Grubb," of twenty-one inches only in focus; and yet the whole area showed a flatness of field which left nothing to be desired. Some rocks in a corner of one of the pictures, which were only a few feet from the camera, were rendered with admirable distinctness. It has been remarked—and with truth—that the waxed-paper process shows great deficiency in the representation of water; but Mr. Hooper has succeeded in obtaining a clear definition of the stones forming the bed of a stream.

Mr. Petschler presented a print from the negative developed at the last meeting of the Society, and taken by the modified collodio-albumen process. This was much admired, and considered equal in softness to specimens by the original Taupenôt process

Votes of thanks were awarded to Mr. Hooper and Mr. Petschler.

The SECRETARY said that he had been requested by a member to report progress as to the intended Photographic Exhibition, and to give some information as to the money voted for that object by the British Association. He stated that he should at all times be happy to answer any inquiries on the subject that would be interesting to the members; but there appeared to be a misapprehension as to his position. It so happened that he was Secretary to the Exhibition Committee; but that was an office entirely distinct from his duties in that room. *The Society had nothing whatever to do with the Exhibition.* A certain number of its members were appointed to represent the Society, and presented a report to the General Committee of the British Association; but there their duty ended. The matter was referred to the Chemical Section of the Association; and those who had the management of the intended Exhibition constituted a sub-committee under that section, and were, therefore, a part of the British Association, not of the Manchester Photographic Society. That was the only way in which the thing could be done, and the money question was simply a guarantee voted to the Chemical Section. He had also been asked how it was that the circular letter advertising the Exhibition had appeared in the *Notes* and not in THE BRITISH JOURNAL OF PHOTOGRAPHY, which was the organ of the Society ?* Of course what he had already said would answer the question; but he did not wish that it should do so, and would therefore explain how it occurred. He had not sent the circular to the editor of any photographic journal: he forwarded parcels to those who would, as he considered, distribute them amongst gentlemen most likely to forward the objects of the undertaking. One of such parcels was sent to Mr. Sutton, as lecturer on photography at King's College, and to that place it was directed. Another parcel was made up in Mr. Shadbolt's name, but his address not being at hand it was not posted; and just at that time circumstances happened which prevented him (the Secretary) from attending to any matters of business.—The Secretary afterwards read a circular letter from the London Photographic Society, in reference to the position assigned to photography at the International Exhibition of 1862, and it was resolved that he be instructed to express the approval of the members of the course taken by the Council of the Photographic Society, and to state that they would join in remonstrating against the slight offered to their art.

The SECRETARY then described the apparatus which he used in copying drawings and other objects in one plane. [See page 253.]

The CHAIRMAN said that they must all feel indebted to Mr. Mabley. He knew, from his own experience, how troublesome the operation of copying was without some apparatus such as they had seen.

A conversation then followed on the process most desirable for copying, in which Mr. WARDLEY stated that he had met with striking proofs lately of the superiority of wet collodion over any dry process for that purpose; and the CHAIRMAN observed that some of the best specimens he had seen had been produced by Mr. Mann on oxymel plates.

Mr. PARRY stated that he and Mr. Young would, at the next meeting, afford means for thoroughly ventilating the hot water process, by practically demonstrating the preparation of the plates and the development of the negatives, on plates ten by eight.

The CHAIRMAN called attention to the desirableness of considering, now and then, statements that were put forward in the photographic journals. Photographers, especially those who were young in the art, were liable to great enthusiasm, and much loss of time and money was frequently caused to those who had not by experience become cautious. As an instance he pointed out a description of a modified albumen process (by J. Larpey), published in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, in which a substratum of collodion, washed in water, was used to receive the iodised albumen. That plan had been described many times, and had been tried years ago by himself and many other members of the Society, but had been given up on account of its extreme insensibility and the difficulty of development; yet the necessary time of exposure according to the author of the paper in question was far less than that required for the Taupenôt process.

Mr. PARRY, Mr. WARDLEY, and the SECRETARY, who had all tried the so-called new process extensively, confirmed the Chairman's statements as to the time required for exposure and development.

Mr. PYNE exhibited Moule's apparatus for washing prints, and, as a tank of water was provided for supplying it, the members were enabled to see the complete manner in which the operation was performed.

A vote of thanks to the Chairman concluded the proceedings.

BRADFORD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Wednesday evening, the 3rd inst.,—Dr. Parkinson in the chair.

A letter was read from Dr. Diamond in reference to the classification of photography at the coming Exhibition of 1862, and after a careful consideration it was unanimously agreed that the Bradford Photographic Society should support the London Photographic Society in its endeavour to secure a more legitimate classification of photographic art; and should Her Majesty's Commissioners refuse to make any alteration in the position assigned, the Society also concurs in its determination to decline exhibiting.

The PRESIDENT asked the members of the Society who availed themselves of the photographic excursion if any good results had been obtained?

Several members opened their plate-boxes, and exhibited many very beautiful views, the greater portion being by the tannin process.

Mr. BELDON said he believed many more negatives might have been taken; but the first part of the day was extremely unsatisfactory. The party left by the 8 30 a.m. train for Crag Vale, and on the road were overtaken by a heavy fall of rain, which greatly depressed the spirits of the excursionists. It, however, cleared up about one o'clock, and the

* We have since received the printed circular alluded to; but too late to be published in the present number.—ED.

remainder of the day was very pleasantly spent. Several parties might be seen at one time busily occupied in their yellow bags changing plates.

The CHAIRMAN then developed some tannin plates in illustration of his paper on that process, which proved very successful.

Mr. BELDON presented a very fine 10 by 8 photograph to the portfolio.

After some discussion on the tannin process the meeting separated.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

THE usual monthly meeting of this Society was held on Friday, the 5th instant, at the Weavers' Tower, New Bridge Street. The chair was occupied by Mr. Dewar.

In consequence of the illness of Mr. North, the SECRETARY stated that the paper which that gentleman had promised to read *On the Construction of Glass Houses, with Special Reference to the Arrangement of Light*, must be postponed.

In the absence of the paper there was a discussion as to the value of the various dry processes. Mr. Dewar recommended the honey process, and Mr. McKie the tannin process; while Mr. Laws advocated the wet process.

An apparatus for cleaning plates was exhibited by Mr. Birnie.

This was the last meeting of the season, and an adjournment took place to the first Friday in October, a general desire being expressed that on that occasion the members would come to the meeting laden with the spoils obtained in the field during the vacation.

THE COMET.—The celestial visitant whose unexpected advent has puzzled the astronomers, was first seen on Sunday, the 30th ult., at ten o'clock at night. Mr. Hind describes the diameter of the nucleus as being only four hundred miles, and when first discovered it was not more than thirteen millions of miles from our planet, to which circumstance may be attributed its extreme brilliancy. "The comet," says Mr. Hind, "arrived at its least distance from the Sun about one o'clock on the morning of June 10, in heliocentric longitude 244° 35′, being then separated from him by 76,000,000 miles. It crossed the plane of the earth's orbit from the south to the north side in longitude 279° 1′ on June 28, in a path inclined 85° 58′ to the ecliptic. The true orbital motion is direct." Many attempts have been made to photograph the "little stranger," but we believe without success. Mr. Warren De la Rue, who has done so much to utilise our art to the purposes of scientific observation, thus writes in the *Athenæum* of the 6th inst.:—"I made an attempt on the 2nd to obtain a photograph of the comet in the focus of my reflector; but not the slightest impression was produced by an exposure of two minutes, although a fixed star was clearly depicted. Yesterday, the 3rd, I made several attempts to photograph the comet by means of Ross's No. 3 portrait lens, mounted on the top of my telescope, and carried round by clockwork—not the slightest trace of the comet was depicted in fifteen minutes, although the fixed stars were depicted. As Donati's comet was photographed by similar means in seven seconds (not by myself), it follows that the present comet is considerably less actinic than Donati's."

Foreign Correspondence.

Paris, July 10th, 1861.

PHOTOGRAPHERS are at present overdone with work, in consequence of the Exhibitions which are preparing at Brussels, Marseilles, and also in your metropolis; for the importance of the last-mentioned is such, that those who wish to worthily figure therein should take time by the forelock. As a result of this state of things we have received but few communications for some weeks past. The Photographic Society of Marseilles has just taken a decision, which has been communicated to us, and which concerns your readers as well as those of the French journals; for we hope that English photographers and manufacturers will not be unrepresented at the Exhibition which will take place in that city. The Society intends not only to exhibit the apparatus that shall be forwarded, but also to organise public lectures, in which will be shown the working of the various instruments. It is therefore necessary that constructors should accompany the apparatus they send to the Secretary of the Society (M. Léon Vidal) with all the details likely to facilitate these explanations. The most important of the new processes will also be explained and practically illustrated. This is an excellent idea, and one which will add to the interest and utility of the Exhibition.

In a paper on the persistence of luminous action, which M. Nièpce de Saint Victor presented to the Academy of Sciences on Monday, the 1st instant, that gentleman appears to us to have replied to most of the objections which his conclusions have called forth.

If we expose a recently-broken portion of an opaque china plate to the solar rays for two or three hours, and then apply it to a sheet of paper prepared with chloride of silver, we shall, after twenty-four hours' contact, obtain a reduction of the salt of silver in the part of the paper corresponding to that portion of the porcelain which has been submitted to the sunlight, whereas that portion which has been protected therefrom produces no effect. This experiment is conclusive; and its result cannot be attributed to chemical action, for porcelain is a perfectly inert body.

Another of M. Nièpce's experiments is the following:—With aquafortis he takes the polish from one-half of a steel plate, and then, after carefully cleaning it with alcohol, he insolates the plate in the following manner for three or four hours:—He places a screen upon it crosswise, and in such a manner that as much of the polished as of the roughened portion of the plate is covered; upon the other half he places a white glass. The plate is afterwards covered with a sheet of albumenised paper, prepared with chloride of silver. After twenty-four hours' contact he obtains an impression from the roughened portion, which has been exposed to the sunlight, but nothing from the polished steel, or from the roughened portion which has been protected by the screen. The same results are produced if for the steel plate we substitute a slip of glass thoroughly roughened. If we cover with violet-coloured glass, the luminous action is less sensible than when we use white glass.

M. Nièpce has also ascertained, by various experiments, that the action of light is incapable either of magnetising or of unmagnetising a steel needle.

M. Nièpce is actively pursuing his investigations in heliochromy, and is now engaged in preparing a new paper on that important subject. Even should he not yet arrive at a complete solution of the great problem, he will, at least, enable you in England to judge of the progress he has made, as he intends to send to the Universal Exhibition some of the plates which he obtains.

M. Paul Liesegang has tried with his collodion, prepared with iodide of sodium, the iodised bath recommended by the Abbé Laborde, and published in the last *Bulletin* of the French Society (No. 6). The experiment has proved the advantages of this process. The negatives are vigorous and well modelled, and the positives present brilliant lights and great purity in the *ensemble*. The exposure is shorter than with a silver bath to which no iodide has been added.

Mr. Talbot, whom we had the honour of seeing a few days ago, during his short stay at Paris, communicated to us a fact tending to prove that the air has more influence than the light in the deterioration of positive pictures. The back of a frame, containing a common photographic image, was pierced with a hole of about the width of a five franc piece. The frame was then hung on a wall exposed to the light. After a certain time the picture was found to be deteriorated in the parts corresponding to the hole, while the other portions were intact.

The *Celébrités Contemporaines*, which already formed the subject of two publications (by Disderi and Pierre Petit), have just given birth to a third work of the kind, published by Carjat. It is an album of card-portraits, accompanied by short biographies, and comes out in numbers. The pictures which compose it are very fine. One feels that they are the work of an artist of taste and experience. Carjat, who was already one of our best caricaturists, has become a photographer quite recently, and has at once placed himself among the cleverest. In order, at the first glance, to seize the salient feature in the physiognomy, and transfer it to the paper with a few strokes of the pencil, one must have not merely a practised hand, but also, and principally, a great talent of observation; and this is equally true of the photographic portraitist.

ERNEST LACAN.

FORMIC ACID IN THE SILVER BATH.*

By M. Mc-A. GAUDIN.

THERE has been much said about the instantaneous *proofs* by M. Ferrier. In presenting them to the French Society of Photography, M. Ferrier attributes his success to the addition of a small quantity of formic acid to the silver bath. I was, at first, much astonished at seeing him, at length, making known something useful to the progress of photography, after his having so well profited by the inventions of others. But my illusion did not last long. This announcement is a TRAP; for formic acid is a pest of the worst kind in the silver bath.

In making my first trial, and in order to ascertain immediately the peculiar action of the formic acid, I added a large quantity of it (a twentieth of the volume of the bath). No impression was obtained, and the glass was wholly covered with a red *layer*, very intense. In

* From *La Lumiere.*

partially removing the bath by a superficial washing, the result was nearly the same; but it is possible that a perfect washing might leave the plate in a superior state of sensibility to that of one washed after the ordinary silver bath.

For my second trial I followed a reverse step. I wished to add only one drop of formic acid per *litre* of the bath; but three drops fell in. With this dose the formic acid produced exactly the same effect as at the first trial. I had still a general fog without any image. I tried to remedy that by the addition of acetic acid without the least success. At last nitric acid put an end to the red fog, and made a picture appear; but at this moment the bath became ineffective by the addition of these acids.

I conclude, then, that in any case one ought not to add to the silver bath even the smallest quantity of formic acid. We may without inconvenience put in tannin, gallic acid, or even pyrogallic acid, provided that, after the reduction operates, care be taken to filter the bath through paper. The same day that I was occupied in restoring my bath *poisoned* with formic acid, working in the dark, I emptied in my bath pyrogallic acid instead of water; and I perceived my error when I raised up the glass, which showed itself of a red colour. This bath, filtered the next day, became clear, and worked very well; but already the nitric acid had destroyed the formic acid.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

RE-DISCOVERIES IN PHOTOGRAPHY.

To the Editor.

Sir,—In the last number of your valuable Journal is published a letter in which my name is prominently introduced. I hope, therefore, you will allow me the opportunity of correcting your correspondent, "Peter Smith," in some of the rash and vague statements he therein makes.

I shall confine myself to a few remarks upon the principal question involved, viz., whether or not the members of the Photographic Society of Scotland have been giving out as new discoveries processes which have been formerly published and patented; and I shall follow your correspondent in the charges he makes against us.

1st. It is stated that Mr. John Sang in 1857 discovered that golden syrup would preserve a collodion plate. Mr. Shadbolt had published his honey process in 1854, and had used syrup and glycerine. But I must remind your correspondent that golden syrup is different from all these, and has as much right to be called new as the oxymel and raspberry syrup processes, both of which were published as newly-discovered processes by Englishmen.

2nd. Sir David Brewster gave an account, in 1857, of a French method of preserving plates. This was communicated by him as a piece of information to the Society, and it is treated by your correspondent as if it had been communicated to the Society by the President as an original invention of his own.

3rd. In January, 1860, Dr. Robert Paterson read to the Society an account of a "New Dry Collodion Process," &c. I beg, Sir, to refer your readers to the *Journal of the Photographic Society*, No. 94, page 155, where they will find the process described as a "Dry Collodion Process," and where, in the first paragraph, it is distinctly stated not to be a new one.

4th. The malt process of Mr. Macnair, and the award of the Council of the Society for it, meets with much better treatment from your correspondent, who states that malt solution had been repeatedly recommended for the purpose of preserving sensitised collodion plates long before Mr. Macnair ever thought of it. I have looked into the history of this, and I have failed to discover when malt solution was ever published as a successful preservative before.

I am aware that syrups, gelatine, albumen, gum, dextrine, grape sugar, sweet worts, beer, &c., &c., had all of them been previously recommended, and many of them patented; but I have yet to learn that the malt process is any of these. It is not a sugar process, although it contains grape sugar: it is not a gum process, although it contains gum: nor a dextrine process, although it contains dextrine: but it is an infusion from a natural substance, containing them all in proper proportions, when made in a certain way and at a certain temperature, and yields results, in simplicity of manipulation, keeping qualities, and shortness of exposure, which belong to no other preservative that I know of. I do not hesitate, therefore, to homologate the award of the Council in this matter, and to state my conviction that this process has as good a right to be called a new one as any other discovery in photography.

With these remarks I leave your readers to judge what confidence is to be placed in the many other statements of your correspondent.—Yours,

Leith, July 11, 1861. ROBERT PATERSON, M.D.

CAMERA STAND.

To the Editor.

Sir,—Will you be kind enough to inform Mr. Clark that the camera stand he speaks of is *no novelty*. I have had one of similar construction in use for the last seven years. I purchased it in New York, where they are in general use, and I have sold several during the last five years I have been back to Oxford. I will send you a photograph of the one I have, so that you can judge for yourself.

If Mr. Clark will send me his direction I will write to him.

With kind thanks for many hints I have had from the Journal,

Oxford, June 27, 1861. I am, yours, &c., J. BOON.

PETSCHLER'S COLLODIO-ALBUMEN PROCESS.

To the Editor.

Sir,—Although this process is a very good one, and has sometimes yielded me excellent results, it is subject to some inconveniences, and the negatives are very liable to be spoilt by stains. In my opinion the mode of manipulation set forth in Mr. Petschler's recent paper on the subject, at p. 215 of the present volume, is not so good as the method first given by him and Mr. Mann. The subsequent washing of the plates to render them sensitive is often a great nuisance, and is not always safe, as the film is apt to rise in blisters during the operation. Two plates have this day been rendered useless to me from this cause. I would therefore recommend that the albumen be washed off at once before the plate is dried, thus reducing the whole to the Fothergill process (of which indeed the Petschler process is only a modification); or, what would be better, to coat the plate with plain albumen and water, half and half, and let it dry, thus doing away with the subsequent washing altogether.

If thought proper a weak solution of chloride of ammonium may be poured over the plate, after washing off the free nitrate, and left on for half a minute, when a final thorough washing should be given to get rid of all traces of the chloride. This answers the same purpose as using the chloride in the albumen.

I am rather surprised to find Mr. Petschler recommending "common kitchen salt" as a good substitute for pure chloride of sodium in the albumen. But why use chloride of sodium at all? Is the tone of the negative or of the transparent positive of no consequence? Salt yields black tones, and sal ammoniac brown ones. It is not therefore a matter of indifference as to which should be employed. It is this recommendation of the wrong thing as a substitute for the right thing that causes so many disappointments in photography, and induces so many amateurs to give it up in disgust.

I will not conclude without expressing my obligations to Messrs. Petschler and Mann, whose process proves very satisfactorily—to me at least—that if washing albumen off in the Fothergill process be not altogether a mistake, superior results are attainable by not doing so. I admit that the Fothergill plate is more sensitive than the other; but this slight extra sensitiveness is no compensation for the loss of that exquisite definition and half-tone, combined with boldness and breadth, which distinguishes the albumen film, whether in the negative or the transparency. It is for this reason I would suggest to those who have worked at this or the Fothergill process to give a trial to the modification I have here recommended. The albumen coating can be coagulated by dipping the plate, after standing it to drain on blotting paper for ten minutes, into a trough of hot water just below the boiling point, and keeping it in for about twenty seconds. This, according to Dr. Ryley and Mr. Parry, not only confers extra sensitiveness but ensures clean negatives free from stains, while the extra trouble is so trifling as to be scarcely worth mention. I am, yours, &c. R.

"PHOTOGRAPHY BY MACHINERY."

To the Editor.

Sir,—A contemporary of yours, in its *small* "talk in the studio" on the 28th ult., states that "a very elaborate specification has been published detailing the particulars of a process for the rapid re-duplication of photographic proofs by the aid of machinery, the invention of Mr. C. Fontayne Flounders [significant name!] of Liverpool." Now, as the conductor of your contemporary never perpetrates a joke, it must be that in making this announcement he is the victim of a hoax. The poetic "Fontayne" has no existence in this northern capital. A *rayther* gullible photo., inquiring of another more wide-a-wake *chiel*—"who *is* Flounders?"—was answered *(more Hibernico)* by him of the open eye putting the usual mysterious question—"Have you seen *Simpson?*"

I have little doubt that when Liverpool achieves anything so important as that stated as *un fait accompli* by your contemporary, the announcement will be found in your own columns first.

In the meantime, I would commend to the profound study of the sagacious gentleman who thus "babbles" in your contemporary the interesting subject (already started by another scientific prodigy) respecting the "chemistry of the comet," or the more familiar problem as to whether the moon is *really* made of green cheese.

I am, yours, &c., THE GORILLA.

Fontenoy Street, Liverpool, July 6, 1861.

MARBLED MARKINGS.

To the EDITOR.

SIR,—Again accept my thanks; and once more allow me to intrude on your time. You see by the enclosed that I am in a bad case. It does not happen often; but when it does, it is usually under most annoying circumstances, viz., after carefully preparing a batch of plates, taking them to a considerable distance, finding afterwards that the choicest bits of scenery have been taken on plates which have (beautiful?) marbled markings, sometimes across the whole plate.

The enclosed, from a Fothergill plate, exposed for an instantaneous picture, was developed only so far as to show the marbling. Now, how does this occur in some plates only out of a batch which have all been prepared with equal care? It cannot be an unclean plate, for I am most scrupulous in this part of the operation.

I shall indicate my method:—Coat and sensitise as usual (forty grain bath), drip eight or ten drops back into the bath, holding by corner A, and dripping from B (the arrow indicates the pouring on of the collodion). Place the plate, face up, into a flat trough, having a recess in the bottom fitting the plate, the depth of which is equal to the thickness of the plate. Put four drachms river water, which has been boiled in a clean tin kettle, into one end of the trough, and wash backwards and forwards with a zig-zag motion for about one minute, or several flowings after greasiness has disappeared. Lift out, drip, flow over and off the plate one dose of albumen. Pour on another two drachms, and work it over the plate half-a-minute. Wash in three changes of common water briskly, rear to dry, and store away.

You are now in the focus of all information, good and bad. I am working alone, without a ray to guide me, save what emanates from your valuable Journal; and I shall look for a little corner of light from the last page of your next.—I am, yours, &c., LEX JACOBUS.

July 8th, 1861.

[The case is simple enough. The partial washing leaves some, though but little, free nitrate of silver on the plate. The albumen coating coming in contact therewith is apt to become slightly coagulated where there is a trifle more moisture than elsewhere; and from your method of washing off the superfluous albumen (which is apt to adhere very firmly where this flocculent semi-coagulated part rests), you are unable to dislodge all that would be desirable. Remedy:—Add a little more liquor ammoniæ to the albumen solution, and wash finally under a tap with a piece of flannel tied over the mouth of it, in order to distribute the stream and arrest particles of dirt. You can readily distinguish the marbling at this stage by looking through the plate; and, by removing the plate farther and farther from the tap, you can increase the force of the fall of water at pleasure, until the coagulum is removed.—ED.]

AN OFFER.

To the EDITOR.

SIR,—Seeing the letter of an inquirer, signed "Improved Lenses," in the July 1st number, I have to remark that if he will send me a stamped and directed envelope I shall be happy to explain to him how he can make his present lens work as he proposes, as I do not agree with your remarks.—I am, yours, &c., A. K. SPARKE.

3, *North Prospect, near Plymouth, July 4th*, 1861.

PAUL PRY "SHUT UP."

DEER MISTUR HEDDITUR,

Hof hall the howdashus story-tellers hi never node sich ha 1 has that Paul Pry has e corls is-self. Y e never kaim neer hour ous has e ses e did hand wots more ede better not, kos ha yung jentlemun has hi "waux with" ses hif e ketches im "wont e lay is hone muddy humbleller hover is sholeders nyther" fur hinsiniwatin that hi as red air, wen hevery 1 as nose me kan c has hits ha *golding yaller*, hand has 2 hies e ses mine har regler stunners hand lites hup is Art hand has fur has my mouth gose hits has sweat has barly shoogur—but hi haute goin to tell u hall e ses. Wot haggerawates me most his is sayin Muther takes hin woshin, witch shead skorn the haction—ha kaptings widder take hin woshin hindeed!—father u no was kapting hof a salin barj has went 2 Arridj for stone—so u c mistur hedditur hall e told u wos a pak o *storeys*, hi had hallmost sed lice but that hante jinteal.

Hif mistur Pry ad not betrade is folcity by is hignerans hof fax, 1 thing e ses wood a maid me suspishus on im, witch e ses the jentlemun as wonts 2 no "wot his sharpnis?" wonts 2 b marrid, has hif henny 1 hoo wonts 2 b marrid diddent no wel hanuf wot sharpnis his, has bruther Jim has gose 2 c ses tel that 2 the *moreens* kos the salurs wont beleave hit. Hi dessa thats jist has grate ha fib has wot e ses hof muther smashin er likenes, witch in coarse mistur hedditur she *coodden* a dun kos u c she never ad no likenes took.

Ho hif hi cood honeli git at im hi doo think hide pinch im hand skrach is hise hout, hand hi no sumbuddy helse has wood serve im hout, so ead better not kum ear, nobuddy hever hinvited him.

Yours confectionally, MARIA SPRIGGINS.

MR. LARPEY'S ALBUMEN PROCESS.

To the EDITOR.

SIR,—I do not exactly understand Mr. J. Larpey's albumen process, as given in your last number, page 235. After coating with collodion and washing, does he pour on plain albumen, and then the ammonium and potassium solution, No. 3, afterwards, separately? or is the latter solution mixed with the albumen? What would be proper proportions for the mixture of the albumen?

I should be much obliged if you would give me the particulars asked above in your next.—I am, yours, &c., R. S. H.

Ballater, July 5th, 1861.

[The author has omitted the words, "*one ounce*," after albumen, which is to have the iodide and bromide mixed with it, being first dissolved in the water, in the proportion given.—ED.]

ANSWERS TO CORRESPONDENTS.

☞ The Publisher has been compelled to omit a large number of advertisements at the last moment.

S. (Houston, Texas).—Received. All right.

J. B.—You will find the details in this number.

WEST DRAYTON.—A thin collodion will be the best for your present purpose.

FANCIFUL.—It is of no use to expect it: he is a regular finder of *mares' nests*.

H. N. (Bristol).—See letter from "The Gorilla." Personally we know nothing about it.

LIBERAL.—Of course the idea is fallacious. We shall have something to say about it in our next.

W. DOYLE.—We believe that the treatise you name is to be obtained at the Ordnance Survey Office, Southampton.

OMAR.—See reply to "Liberal." We do not attribute malice in the matter, though perhaps jealousy warps the judgment a little.

C. BEST.—A small quantity of free *nitric* acid in the bath, and an iron developer—proto-nitrate of iron—will be the most suitable for producing single copies on glass.

J. L. (Perth).—It is scarcely fair to others to object to your letter of inquiry appearing in type, as the replies which are useful to you are also useful to others when the case is also before them; and, by the use of a *nom de plume*, your native modesty need not be shocked.

SIMPLE JOHN.—All pretenders are not willing rogues; we have found many who are as much their own dupes as are their pupils, a circumstance which arises probably from an excessive development of self-esteem. Try another: you will most likely be more fortunate next time, and you have at least learned to know something that will *not* do.

R. F. B.—Without admitting that the matter is proven, we are not in a position until we have had an opportunity of looking into the theory, to assert that it is erroneous, however opposed to existing ideas. There are many difficulties to be met; but the promulgator is a clever man, and not over-hasty in coming to a conclusion, like his exponent.

A MANCHESTER MAN.—You are right: the account is not only *abstracted* from the paper, but from our Journal also, without acknowledgment. This is a system against which we have in vain protested several times, and we have distinct personal as well as circumstantial evidence of similar appropriation of two other papers, without the knowledge or consent of the authors. We know (that is morally) that the same course has been pursued in other cases; but we have had *personal* assurance thereof from the authors with regard to the two instances to which we allude. On the next occasion, when we take the trouble to verify the fact by actual reference, we will publish the reply, and see if that will stop the practice.

FLORA (Devon).—We believe there is much to be done in the direction which you suggest, and it would be a very elegant application of photography for a lady who has some skill in colouring. There is considerable skill required in the due arrangement of the flowers, and also in their illumination. You will find some colours very obstinate in refusing to render up their due effect in light and shade; but much of this difficulty is to be overcome by due attention to the sensitising material in your collodion. You should read a paper by Mr. Heisch, in one of our back volumes, bearing upon this subject. Much also may be done by proper illumination. Mr. Mainwaring presented some fine specimens of his own production to the North London Photographic Association, for its album, which are of the kind you indicate.

FINE ARTS.—Your letter having been sent to the *Publisher* instead of direct to us, did not reach us until too late for reply in our last. The tone of a proof depends materially upon the nature of the paper on which it is printed. You cannot produce the cool purple tones on an English paper as a rule. You do not state whether you desire to print on albumenised or plain paper; and there is some obscurity in your description of your gold solution, of which you say you put a drachm into eight ounces of water. What was the *strength* of the original solution? However, we will endeavour to aid you. To your gold solution add, drop by drop, solution of carbonate of soda until it no longer reddens litmus paper, keeping back a small quantity (say a drachm) of the solution; then add this to the neutralised solution, to make the whole very faintly acid. Then add water enough to make one drachm of solution contain but *one* grain of gold. When about to tone your prints (but not before), take of this gold solution one drachm, mix it with ten ounces of water, and add thereto five grains of carbonate of soda. If they tone slowly, warm the solution. When they have reached the proper colour, which should occur in from two to ten minutes, remove and wash them, and then fix in hyposulphite of soda one ounce, water five ounces. You will find papier Saxe, of the thick kind, good for plain paper proofs of a purple tone. Never mind the *colour* of your negatives if they stop out the light well; but, if you lack intensity before concluding your development, add a few drops of albumen solution to the developer.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 147, Vol. VIII.—AUGUST 1, 1861.

A Tribute of Thanks.—In another column will be found, from the pen of a contributor, a well-deserved tribute to the worth of our much-esteemed friend and fellow-labourer, Mr. Hardwich.

Our readers may perhaps feel some surprise that the retirement of so distinguished an ornament of the photographic world was allowed to occur without special notice from us, and that the first announcement of so great a calamity to photographers generally should have been made in the pages of a contemporary. The matter is easily enough explained. For the last six months we have been well aware of the great probability of our friend's withdrawal from his long accustomed place, and of the progress and fulfilment of his appointed course so far as it has hitherto advanced; but we had no authority to make this matter known, and from our intimate knowledge of our valued friend's retiring disposition, we could not fail to be aware that to have done so without his sanction would have been simply to have inflicted pain upon his sensitive nature. Other hands having however rudely drawn aside the veil which he had so modestly placed to screen his exit, it would now be but false delicacy in us to withold our meed of warmest thanks towards him in affectionate remembrance of our long and pleasant intercourse.

Most photographers will be well aware that they have in Mr. Hardwich's removal to a higher sphere of action sustained a heavy loss, but few will really know *how heavy* is that loss. Of one thing we feel assured—that is, of our friend's success in his newer calling: perhaps not such success as the world would praise—advancement and high emolument, for these are not his aspirations—but success in the objects which he has proposed to himself, the "lifting up of the hands which hang down and the strengthening of the feeble knees." Our friend's lines have scarcely fallen in what may be regarded as pleasant places, being in the black and dreary colliery districts of Durham. But happiness consists not in our surroundings so much as in the heart; and his, like the cheerful flame, is warm enough to kindle a corresponding glow in the hearts of all with whom he comes into intimate contact. Long may he live to cheer the spirits of many a weary pilgrim!

Photographic Measles.—We perceive that a confusion of ideas upon the meaning of this term is likely to be introduced in consequence of a paper by Mr. F. G. Eliot, which lately appeared in the pages of a contemporary, containing a description of, and proposed remedy for, two different photographic complaints, both of which he has included under this term, and neither of them being connected with that to which the designation was at first applied. We do not make any decisive assertion as to which of the three complaints is *generally* regarded by photographers as "measles," though we entertain an opinion upon this point; but we purpose to revert to the original sponsor for his decision in the matter.

If we are correct in our assumption, the *first* application of this word in connection with photographic failures was made by Mr. C. Jabez Hughes at a meeting of the North London Photographic Association, and it was felt to be so apt and descriptive of the appearance presented that it was at once adopted by acclamation. The phenomenon itself to which the term was applied was old enough and annoying enough to many operators: it was that deposit of yellowish matter in the *fabric of the paper* demonstrated by Mr. Dawson to be produced by decomposition of hyposulphite of silver formed in the process of fixing, and this occurs at least as often when proofs are printed upon plain as upon albumenised paper. We commend to Mr. Eliot's perusal, as also to all interested in the question, Mr. Dawson's paper, which they will find at pp. 174 and 175 of our 7th Vol., No. 120, published on 15th June, 1860.

With reference to the phenomenon to which the word "measley" was first applied, we refer our readers to reports of the meetings of the North London Photographic Association, Vol 7, pp. 85, 86, 152, and 182, which also testify to the paternity of the designation. To so good a photographer as Mr. Francis G. Eliot we need not apologise for drawing his attention to the inconvenience that is likely to arise from the application of one term to several distinct phenomena—an application that we are convinced was inadvertently made on his part, and which we feel assured he will be one of the first to correct. Confusion of terms is always an evil to be avoided if possible; and we have several times had serious thoughts of compiling a sort of pathological photographic vocabulary. Perhaps some of our correspondents will assist us in such an undertaking.

Photography at the Industrial Exhibition of 1862.—We greatly rejoice at the dignified and uncompromising attitude assumed by the Council of the Photographic Society with reference to the non-appointment of a Committee to act with the Royal Commissioners while the latter persist in their preposterous classification of the products of our Art-science. Our worthy friend, the editor of the *Journal of the Photographic Society*, has in his last issue placed the matter as it then stood very fully before his readers, and in a leading article enunciated the principles which have guided the Council in its course of proceeding, and which appear to us to be perfectly sound and unanswerable. We commend it to our readers for perusal and consideration. As our brother editor observes, there exists a wonderful amount of unanimity and sympathy upon the nature of the treatment to which photographers have been subjected. The evil is acknowledged all but universally: on the method of meeting the difficulty, on the contrary, there is a considerable variety of opinion. This is quite natural; and as it is of necessity that the Council must adopt some proceeding, and cannot by any possibility agree with more than one of those recommended, we rejoice to find that after mature deliberation a dignified course has been decided on and consistently pursued throughout. Personally we fully endorse the views of the Council of the Photographic Society, and tender our warmest thanks for the passive resistance already offered to the degrading terms proposed by the Royal Commissioners.

It must not be forgotten, however, that there exists a minority as well as a majority; and as the true principles of representa-

tion dictate that each should exert its due amount of influence, we shall be both ready and willing to publish the views of our "friends on the other side" of the question—for we cannot call them our opponents—and hereby invite them to give utterance to the same through our columns. We have not hitherto had any opportunity of circulating the opposition sentiments, because no opinions have been addressed to us excepting in the same direction as our own; but we are not at all desirous of having the argument all to ourselves.

We cannot resist extracting the following letter, by Dr. Lyon Playfair, from the pages of the Society's Journal, both on account of its logical deduction and because we have a word or two of comment upon an opinion expressed therein. The letter is as follows:—

Edinburgh, June 3rd, 1861.

My dear Sir,—In 1851 photography had not sufficiently developed to be considered entitled to a separate class in the Great Exhibition, and accordingly photographic pictures were accepted merely as illustrations of the work of photographic apparatus. But when, in 1862, the Commissioners deem it worthy to have a class for itself, then it must be treated logically on the principles which guide the classification. While fully admitting the claims of photography to be put in a separate class, I see many difficulties which arise in treating it as such. For instance, photographs of machines might require to be placed along with machinery, just as drawings of machinery would be so placed; while photographs of structures and buildings might appropriately belong to civil engineering and architecture. But these difficulties should have occurred to the Commissioners in making the classification, and do not justify them in making confusion worse confounded by inserting the distinct class which they have made with machinery—in classifying results with the apparatus employed to produce them—thus losing the whole philosophy of the classification.

It does not improve matters to say that photographs may be exhibited by themselves in a separate apartment which may be in association with engravings or others parts of the Exhibition. This would certainly be a practical admission of a mistake; but, at the same time, it would allow the ugly defacement of the classification to remain, and would still claim as admitted on the part of photographers that their art was purely a mechanical one.

If the Commissioners were right in giving to photographers a separate class, then it can only be associated with Fine Arts on any principle of classification, although the difficulties will be felt of including in the section certain kinds of photographic pictures which cannot properly be considered to belong to Fine Arts.

Yours, sincerely,
Lyon Playfair.

P.S. You will recollect how very long it was before engraving received its proper place among the Fine Arts; and you can scarcely be surprised that artists are still unwilling to give a place to an art so young in history as yours.

Hugh W. Diamond, Esq., M.D.

It would almost seem from the foregoing that the learned doctor considers that if photography be entitled to be put in a separate class, insurmountable difficulties arise in thus treating it. Let us consider the parallel case of engraving, which forms a separate class or sub-class. Why not treat it in the same manner? It is not *every* engraving that will be classed with the fine arts: those illustrative of machinery, architecture, &c., fall into their natural positions; they are *applications* of engraving to other than art purposes. Why not treat photographs in a similar way, and include applied photography in each of the sections to which it is applied, and leave in the Fine Arts section only just precisely those specimens which would have been included supposing them to have been engravings? We think this would be a compromise that might be gracefully conceded by the Royal Commissioners and reasonably accepted by the photographic community without loss of position. We have already forwarded this suggestion to the Royal Commissioners and obtained an acknowledgment of its receipt.

Amateur Photographic Association.—It has been said that "there can be no great success without some opposition;" if so we need not be surprised at the "big stone" (as our American cousins would call it) which has been thrown at this undertaking by the South London Photographic Society in its somewhat discursive annual report. We had imagined that the days of *protection* had for ever passed away, but every now and then a melancholy wail is heard which indicates that the old superstition has not yet quite died out. What damage a huge exchange club can do to the South London Photographic Society, or why as a society it should be so particularly timorous about the commercial aspect of photography as to put itself into a fever about a suppositious competition, it would puzzle a conjuror to determine. But there is "balm in Gilead:" it may calm its fear. None of those evils that it anticipates will come to pass. There is no *unfair* competition in contemplation, nor is the assertion made in the "annual report" true. Payment for *bare materials* alone is not all that is expected; but cost of labour is also included, and a fair profit in addition upon all proofs *sold to the public*. Those who are members of the Association have surely a right to waive that profit in favour of one another without being charged with competing with the profession. Every exchange club, nay every society, which presents its members with photographs would otherwise be liable to the same imputation. But even if this charge were true—which it is not—the preposterous parallel attempted to be drawn between the proceedings of the Amateur Photographic Association and the Government interference at South Kensington is simply ridiculous. At least the former pays *all* costs out of the pockets of its *own members*, having no power to compel, nor desire to ask, the general public to assist in any way; while the Department of Science and Art does just the reverse, upon the pretence of promulgating a love of art.

But while contending for the absolute right of amateurs to associate themselves together for the furtherance of their art, even if it were detrimental to the professional members, we altogether deny that in the case before us it is so; and we may further add that did we so deem it we should most assuredly not have been personally connected with any such scheme. But the truth is, the more that the amateur element is cultivated the better for the professional man—the greater the demand for the professional operator's work. In the long run the amateur cannot compete with his professional brethren from a commercial point of view, paradoxical as the assertion may seem: his time is too valuable. An amateur's productions, if excellent (as very many of them undoubtedly are), is almost always a *tour de force*—a species of manufacture which never pays as a commercial speculation. Lastly, we may observe that nine times in ten whatever an amateur earns by his hobby he generally spends thereon, together with sundry not trifling additions thereto. Probably if those gentlemen who have felt alarmed about competition will read the prospectus again carefully they will perceive that their apprehensions are groundless.

While on the subject of the Association we may be permitted to mention, for the information of some members *de facto* and others *in posse*, that the Committee has in contemplation the appointment of Local Secretaries, through whom members in the provinces may have some means of personal communication with those at head quarters, and to whom they may be more readily inclined to entrust their negatives in preference to forwarding them by rail, with the risk of damage, addressed to an individual who may be well enough known by reputation, but must of necessity be to most a mere personal abstraction. Each point of difficulty in working the Association as it arises is carefully considered and a decision arrived at—the two primary conditions always kept in view being the satisfaction of the members individually and the general advantage of the Photographic Art.

A discovery has just been made in Orkney of a vaulted chamber in the "Maes How," containing numerous Runic inscriptions. Careful drawings are about to be made of these inscriptions, to be afterwards engraved, for the purpose of being submitted to the learned bodies in Europe. We think that Mr. Stuart, of the Edinburgh Museum of Antiquities, will commit a great mistake if he omit to call in the aid of photography for this purpose. Even should the chamber be in perfect darkness, a photographic record of these inscriptions can be readily obtained by aid of Moule's photogen.

STEREOSCOPIC CAMERA WITHOUT SLIDES, FOR DRY-PLATE PHOTOGRAPHY, AND TEN BY EIGHT CAMERA, ON ONE STAND,

As used by JOHN CRAMB *during his Photographic Tour in Palestine in* 1860.

FIG. 1 represents the top of the tripod, with the cameras in position as I usually used them during my journey in Palestine.

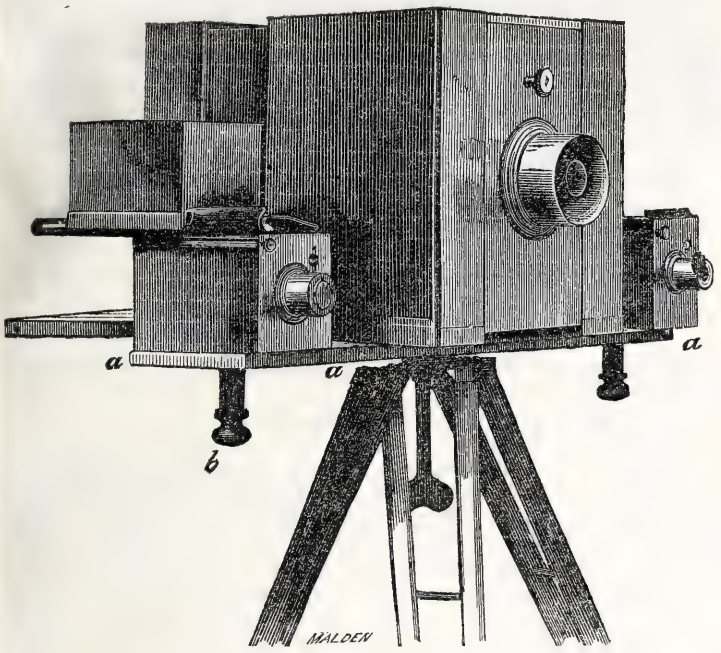


FIG. 1.

The reader will at once see there is a board screwed to the stand, on which again the three cameras are fastened. The 10 by 8 camera is placed in the centre; and, as it was merely an ordinary solid body one, made of mahogany, I do not propose any further reference to it than to call attention to its position on the stand. The board, *a*, is about two feet long, and moves on the top of the tripod in the same way as a single camera usually does on its stand. A slit is made in this board at each end, and passing up to nearly the centre. Through this slit a screw, *b*, passes easily, by which the stereo. camera is fixed to the board, allowing horizontal motion to any extent.

The stereo. cameras are a little peculiar, and to them I would call particular attention. There are no slides: the prepared plates pass at once from the plate-box into the camera. This has many advantages for dry-plate photography. By it one is enabled to carry a very large number of prepared plates, ready for exposure, within a small space. The cameras themselves are very much reduced in size, and the entire affair is more easily made than a camera with slides. Defects in the fitting of parts in the making, or the result of warping or shrinking, is in no degree so detrimental as in a camera with slides, where every part must be tight, or light will be admitted, and the whole thing destroyed.

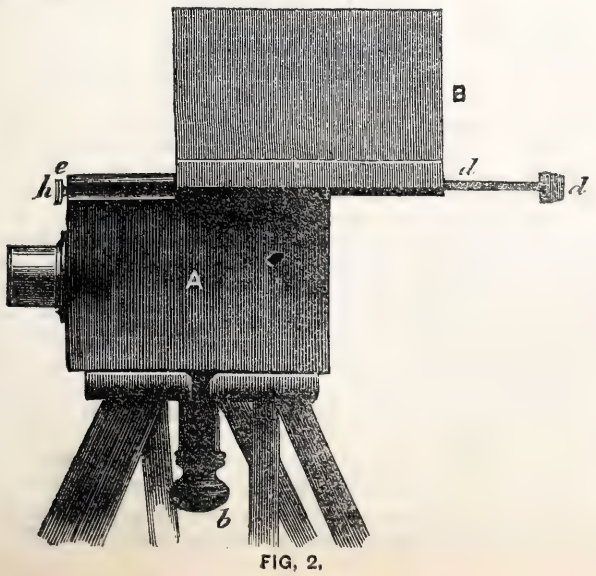


FIG. 2.

The construction of these cameras will be better understood from an inspection of *Figures* 2 and 3. The camera A is fastened to the stand by the screw *b*. B is the plate-box, sliding readily on the top of the camera. The lines *c c c (Fig.* 2*)* indicate the position of the prepared glasses in the plate-box. The lid of the box, *d*, is seen half withdrawn. In using the box the lid is not withdrawn, but is pushed out as the box is pushed on to the *top* of the camera, *e*, which in fact becomes the lid of the box, fitting into the same groove in which the lid of the plate-box slides.

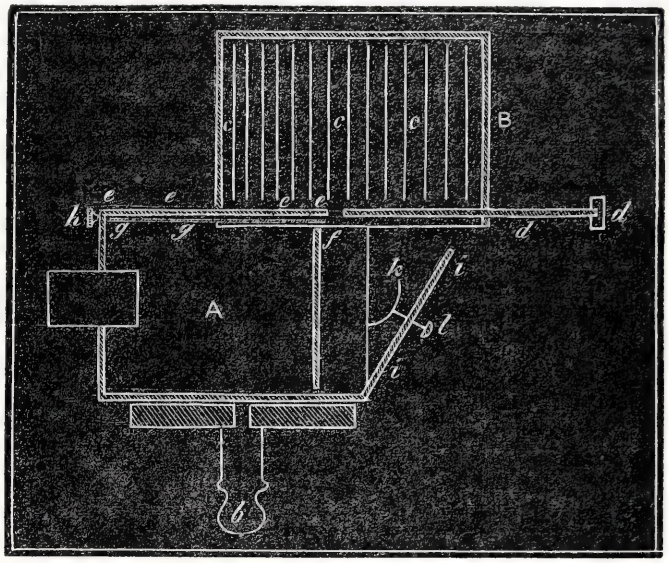


FIG. 3.

An inspection of *Fig.* 3 will at once show that all the prepared glasses rest on either the top of the camera or on the lid of the box. If we wish to drop a plate from the plate-box we have but to keep the box and camera firmly in their position and withdraw the lid a little, and immediately, on the support being removed, the glass drops into its place in the camera at *f*, where a small ledge projects from the side of the camera, to which the plate may be closely pressed, and which has been previously ascertained to be in focus.

The plate-box can be now withdrawn entirely; and to do so it is merely necessary to keep the lid, *d*, pressing on the top of the camera, *e*, as we draw off the box. Before doing so, however, it will be necessary to close the opening by which the glass descended into the camera. This is accomplished by pushing in the knob, *h*, which moves the slide, *g g*, whereby the opening at *f* is effectually and easily closed.

The focussing is accomplished before the plate-box is put on at all. The back of the camera opens down as shown at *i*, *Fig.* 3. This being folded down, a ground glass is dropped into the same place as the prepared plate is to occupy.

The focus having been secured, and the cameras both adjusted, the back doors are shut, and the prepared glasses dropped in from the plate-boxes. The sensitive plates are pressed into the focal position by the spring *k*, which is brought into contact with the back of the glass by the screw *l*.

The box that I have used for many years holds fourteen plates. The side of the lid is numbered and carefully divided, so that any plate can be dropped into the camera. To return them to the plate-box the arrangement is reversed. By unscrewing the cameras they are drawn off the board by the slit before referred to. This saves the entire removal of the screws *b*, and consequent risk of losing them.

The plate-box is now placed lowermost, and the camera slided on to the point where we know the empty groove is. The slide, *g*, is withdrawn, and down drops the plate into its former place. The whole of these changes are very rapidly made.

Many persons will think this camera difficult to make and troublesome to work. My experience leads me to say that the reverse is the fact. They are very easily made by any ordinary cabinet-maker; and anyone will, after one trial, find no difficulty in using them.

I often wished during my tour that I had had the 10 by 8 camera on the same plan. The only objection is that it is not very suitable for wet-plate work, though it has done work by that process. In that case the camera is taken into the tent or dark closet, its place on the stand being marked, so that it can be replaced in the same position.

IN MEMORIAM.

ANOTHER earnest and indefatigable labourer in the photographic hive—a kindly spirit, ever accessible to all; a genial, large-hearted man, conscientious, talented, and humble, as real worth always is—has passed away from among us. Not indeed through the dim dusky portals of this nether world, thank Heaven! but to a nobler, purer, loftier field—one that may never bring him honour or celebrity in this world, though it will that solid satisfaction which no worldly pursuit can give—a field in which only a perfect nature can find rest and repose. A name unsullied by violent partisanship or one personal brawl is dead to us: and we have not too many labourers in the field of patient research and laborious and often unappreciated scientific investigation. This is comparatively—and comparatively only—the broad noon-day of photography to the early grey twilight dawn in which Mr. Hardwich and others laboured as pioneers, when men were groping as in a dark place. There are—and we deplore it—those among us who carp at everything, and who would "clip an angel's wings." There are—and we say it with indignation—those who have wilfully forgotten the sources of much of their knowledge, and arrogate to themselves results to which others have macadamised the road. The literature of photography is meagre enough—low enough: to that Mr. Hardwich brings by far the most solid contribution.

That photography has too few inducements to offer to a man of Mr. Hardwich's attainments is *not* our fault; that we should allow him to pass away from among us and not record our appreciation, and embody it in some tangible form, would be: not for his sake—we cannot remunerate such labours or such men with money (let photographers get over that miserable delusion)—but for our own. Let it not be said that any one of those who bore the heat and burden of the day—who helped to place photography on the pedestal upon which it stands, lifting up its face to the yet higher region it shall occupy hereafter—came among us and we knew or remembered him not. Doubtless Mr. Hardwich will adorn the sacred office which he has deliberately and affectionately chosen. The ranks of science have supplied the Church with some of its purest and brightest ornaments: such was Chalmers and many more. But we cling to old associations—all whose hearts are not as "dry as summer dust;" and though we would not wish him back to mingle in

> "the low, vain strife;
> The try for wealth or power, that makes men mad;
> The passions and the cares that wither life,
> And waste its little hour"—

yet we cannot—ought not—to let the circumstance pass by and awaken no expression of regret—elicit no token or remembrance of the past—no God-speed for the future. Let the world see that we have some *esprit de corps* among us. Let each Society open a subscription list of its own for the purpose of raising a moderate sum, sufficient for the purchase of some testimonial worthy of us to give—worthy of him to receive. The donations need not be large, and what is now but an idea will become a substantial reality.

S. T.

THE INDUSTRIAL EXHIBITION OF 1862.

AN official reply to the circular addressed to the various home and foreign Photographic Societies by the Secretary of the Photographic Society (London), relative to the position assigned to photography by the Royal Commissioners, has been addressed to the Council by the Secretary of the French Photographic Society, as follows:—

I have the honour to inform you that a Council and General Meeting of this Society have been successively held, to consider the grave communication which you have made to us, in the name of the Photographic Society of London, on the subject of the approaching Universal Exposition.

The French Photographic Society is startled not less strongly than that of London at the error committed in the programme of the Exposition so far as the classification of photography is concerned. It is sufficient to have visited one of our Exhibitions to have become convinced that photographic works—those, at least, which their authors have produced with a feeling of art—are not a mechanical result. In fact, two artists, with the same apparatus and under the same conditions, can render the same portrait, the same view, not only in a very different manner, but each according to his own individual feeling.

Further, Dr. Playfair, in his letter which you have forwarded, has himself demonstrated the error; and, like him, we doubt not that the Royal Commission, if it be able to alter arrangements already decided upon, will not be the less disposed to repair this error as soon as it is possible for them to do so.

The French Photographic Society has, without doubt, the right and duty of protesting against the consequences of the philosophical error committed, since all its efforts, like those of your own Society, tend to elevate photography to the dignity of an art; but, in partaking of the just indignation of the London Society, it cannot adopt the same conclusions.

In the first place, our position is not the same. You can, as English exhibitors, communicate directly with the Royal Commissioners; but foreigners, *as guests* invited to take part in the Exposition, though they have an incontestible right to decline the invitation, have not that of protesting against the arrangements established. The Imperial Commission alone would have, without doubt, an official character sufficient to represent the views of the French exhibitors; and I hasten to add that we have already received the assurance of the considerate intentions of the Royal Commissioners of London towards photography.

At length the General Meeting was unanimous in recognising that in any case—even if the Royal Commission believed itself prevented from repairing as soon as possible the error committed (though the meeting was well convinced of the contrary)—abstinence from exhibiting would be the most deplorable way of protesting: that abstinence would in fact only result in estranging true artists, whose works do honour to photography, and to leave their places free to mere workmen, whose detestable productions would in the eyes of the public only justify the error which we all deplore. We think then that, far from encouraging absence, the photographic societies ought to make a more pressing appeal to artists worthy of the name, to show themselves more severe in the choice of works brought forward. Such an exhibition, in the midst of the Universal Exposition, would certainly be, by its importance and interest, the most worthy, useful, and certain protest.

The French Photographic Society, always animated by a lively and sincere desire of preserving the happy union which exists between it and that of London, hopes that the latter, appreciating the preceding considerations, will neglect nothing to obtain in its execution the realisation of the benevolent intentions of the Royal Commission of which the assurance has already been given to us.

On Friday next, 19th July, we shall hold another general meeting, which should be the last before the recess. The Council will meet on Tuesday next. We request you will, if possible, transmit to us by Tuesday, or at least before Friday, the fresh communication that we hope to receive from you.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By JAMES MARTIN.

ACETIC ACID.

Synonymes.—White wine vinegar, radical vinegar, acetous acid, acetylic acid.

Composition.—$C_4H_4O_4$ or $C_4H_3O_3 + HO$.

Equivalent.—60.

Preparation.—This substance is so much more advantageously prepared on the large scale that those residing in England will, it is assumed, purchase the article supplied by the trade, and use it after testing it in the manner herein set forth. The photographers alluded to in the introduction as being "beyond the reach of chemists' shops" will, however, be glad to learn that common household vinegar contains this acid ready formed. It only remains to concentrate and purify it, and this may be accomplished in the following manner:—Take any convenient quantity of good vinegar, and add thereto carbonate of soda, *i.e.* common washing soda, until effervescence ceases; then filter or strain the liquor through muslin, and boil down to dryness. Having weighed the dry mass, introduce it into a retort, or flask, with bent tube attached, and add to it three times its own weight of sulphuric acid, *i.e.* oil of vitriol. Sufficient heat is evolved by the mixture to volatilise a portion of the acid, and a gentle heat expels the remainder. The condensation of the acid may be best effected by means of a Liebig's condenser; but, if this be not at hand, damp cloths wrapped round the beak or neck of the retort, and the receiver surrounded by cold water, may be made to answer the purpose. The distilled product is rectified by redistillation; and at this stage of the process a little peroxide of lead (or in its absence *red lead*) may be advantageously added, for the purpose of converting any traces of sulphurous acid formed in the first operation into sulphate of lead.

If it be desired to obtain a very concentrated preparation for use in a paper process, the acid, after rectification, should be exposed to a low temperature by surrounding the bottle containing it with a freezing mixture of ice and salt. Crystals of hydrated acetic acid are formed in a weaker liquid, which being drained off and preserved for other uses, the crystals are again melted and frozen a second time, and again allowed to drain. The solid product resulting from this second operation is generally free from all superfluous water.

Properties or Physical Characters.—Acetic acid thus obtained forms at a temperature below 60° Fah. (15.5.C) large colourless transparent crystals, which melt at 62° or 63° Fah. to a thin colourless, *inflammable* liquid of exceedingly pungent and well-known odour, having a density of 1·063, and boiling at 248°. A remarkable fact in connexion with this body is, that its density does not indicate its actual strength: this is determined only by its power to saturate a known measure of a test solution of carbonate of soda or of caustic ammonia. It is miscible in all proportions with water, alcohol, and ether, and is a good solvent for camphor and several resins and volatile oils; aromatic vinegar being an instance of camphor with oils of lemon and bergamot dissolved in strong acetic acid. In its strongest form it raises a blister on the skin, and will even produce a painful sore like a mineral acid; but when diluted it has a pleasant acid taste. It forms with bases an important class of salts called *acetates*, all of which are soluble in water.

Impurities.—The articles met with in commerce may contain—1, volatile tarry matter, imparting an empyreumatic odour; 2, sulphuric acid; 3, sulphurous acid; 4, hydrochloric acid; 5, aldehyde; 6 (when it possesses an odour of garlic), an organic sulphur acid.

Tests.—The first operation to be performed in the qualitative examination of acetic acid with a view to determine the presence or absence of the above impurities is *dilution* with *distilled water*. Should this produce a milkiness in the mixture it is evidence that it contains volatile, tarry, and empyreumatic substances, which render it totally unfit for photographic purposes. If the specimen under examination should remain clear on dilution with water a solution of nitrate of silver should next be added, when, if a white precipitate be produced, the presence of the third and fourth (and if the solutions be not *very* dilute) of the second impurities may be inferred. It is, however, quite possible that no precipitate may occur on the addition of this re-agent; and yet, on exposing the mixture to light, a darkening may take place. This may be regarded as evidence of the reducing effect of the fifth impurity—aldehyde, a substance which, being a reducing agent, would of course have a tendency to modify the retarding action exercised by acetic acid in developing, and therefore ought not to be present. The sixth impurity referred to, namely, an organic sulphur acid, may be at once recognised by the characteristic odour of garlic, and marks the sample of acetic acid containing it as one which should be unhesitatingly rejected.

Per-centage of Pure in Commercial Article.—That known in commerce as Beaufoy's acid contains about thirty per cent. of real acid. Ordinary glacial contains about ninety-five per cent., and the true glacial, solid at 50° Fah., one hundred per cent.; and this latter preparation, in order that it should possess the property of solidifying at the temperature named, must of necessity be constant in its character—a quality which it is considered should recommend it for employment on *all* occasions where acetic acid is introduced, with the view of obtaining more uniform success in photographic manipulations—a result which might be more reasonably hoped for were greater attention given to the *purity* and *constant uniformity* of the chemicals used.

Uses.—Acetic acid is employed in photography as a retarding agent in negative developing solutions. Were pyrogallic acid alone employed to develop a negative after exposure in the camera, the reduction of silver would be so rapid and general as to obliterate all traces of the picture. The acid under consideration modifies this reducing action, allowing it to take place only in proportion as the film has been acted on by light. The proportion in a developing solution should be increased in warm and diminished in cold weather.

Effect of Internal Administration.—Cases of poisoning by acetic acid are not frequent. When, however, it is resorted to for this purpose it produces profuse perspiration; the pulse becomes quick and small; a burning pain in the chest and abdomen is felt, and a sensation of sickness.

Antidote.—Water should be freely administered so as to dilute, and carbonate of magnesia or chalk mixed with it to neutralise, the acid. Albumen, *i.e.* white of egg, milk, and oleaginous drinks may also be administered, with a view to produce an emollient and demulcent effect on the corroded membraneous lining of the stomach and intestines.

PHOTOGRAPHY APPLIED TO PICTORIAL DECORATION.

By S. Thompson.

One of the characteristics of the age is decidedly a growing taste for pictorial decoration; and it is a taste which, like most others, "grows by what it feeds on." One of the wants most universally felt by those who cater for it is more means of meeting that taste in an inexpensive manner; for "homes of taste" are now no longer confined to "the upper ten thousand," but are sought for and achieved by the tens of thousands who constitute, in numberless gradations, the middle classes.

It would occupy too much space to enter here upon an examination of the effect of beauty in nature and art upon the human mind, even were it practicable to come to unchangeable conclusions. What the final use may be, to men, of art, of painting, or of natural beauty, is a question inextricably complicated with the enervating influence of all luxury. All perhaps are good, if rightly received. History shows us that the arts and sciences, ministering to the *pride* of nations, only hastened their ruin; but it may be firmly and unhesitatingly believed that the same arts and sciences will tend as distinctly to exalt the strength and quicken the soul of every nation which employs them to increase the comfort of lowly life and grace with happy intelligence the unambitious courses of honourable toil.

The want before referred to has at length been met in a way which admits of infinite applications and endless variety. Glass, which in itself has contributed so much to our comforts and our enjoyments, in a certain degree almost unequalled by any other discovery of modern civilisation, will now, by the aid of photography, become a medium of pictorial decoration. We allude to the new process of producing photographs on glass in enamel colours just perfected and patented by M. Joubert. Glass, in all its multitudinous forms, is a thing which meets the eye almost more frequently than any other. To unite pictorial art with this beautiful medium has long been a desideratum. Glass-painting is a most expensive process, and requires a very long time to arrive at perfect results, and, moreover, is exposed to many accidents—a work which has occupied many weeks, or even months, being liable to be utterly spoiled in the last firing—and all this keeps up the price of painted glass so as to make it quite inaccessible to the many. Transparent glass photographs have long been familiar to us; but they require the additional protection of ground glass, and there are many reasons against their use in interior or exterior decoration, apart from the most important reason of all—the question of *permanency*. What spectres of "fair and faded things" are conjured up by the bare mention of the word! How much greater must be the degree of permanence required for photographs which are to be framed in ordinary window-sashes, and expected to defy time and weather, and submit to be cleaned as readily as a common window-pane. Yet these hard conditions have been met, and they have been found, after applying the severest tests, to be absolutely indelible. The picture, indeed, forms an integral portion of the glass itself: the only ingredient left after the last washing on the glass has affinity with it, and, being placed in a kiln, is burnt in and thoroughly amalgamated with it. So strange is it that the same element which is so often a fierce destroyer can, under certain conditions, preserve, and by its means such things be rendered imperishable!

Unlike other glass transparencies, those by M. Joubert's process must be obtained from positives. Glass positives taken from *negatives* are the best for the purpose, and are indispensable for obtaining the highest results the process is capable of; but paper positives will do if waxed, and if the paper be free from granulations, inequalities of substance, and all those blemishes which photographic paper unfortunately seldom *is* free from. The glass which is to receive the image is first rendered *photographically* clean, and then coated with a liquid precisely in the same manner as with collodion. This liquid is composed of a saturated solution of bichromate of ammonia in the proportion of five parts; honey and albumen three parts of each, well mixed, and thinned with from twenty to thirty parts of distilled water, and then filtered. The preparation of this solution and the coating of the plate should be conducted in the dark room, as this is, photographically speaking, both collodion and nitrate bath, no other sensitiser being used. No bath! What photographer would like *such* a plate to be dipped in his bath? The glass plate coated with solution is then properly dried by means of a gas stove in a few minutes, and then placed upon the glass or paper positive (not negative) in the same manner as we place a piece of sensitised paper on an ordinary negative. The pressure-frame, of the usual kind, is then screwed down and taken out of the dark room and exposed to the light. The time of exposure will of course vary, but a short exposure of a few seconds will generally suffice. On removing the coated plate from the pressure-frame, a *faintly* indicated picture in a negative condition is seen. To develop it, or bring it out, an enamel colour in a very finely divided powdery state is gently rubbed over with a soft brush until the whole composition or subject appears in a perfect *positive* form. The fixing solution is pure alcohol in which a little acid has been mixed. Either acetic or nitric will do. When the alcohol has completely evaporated, which will generally be the case in a very short time, the glass is quietly immersed horizontally in a large pan of clear water, and left until the chromic solution has dissolved off and nothing remains except the enamel colour on the glass. It is then set to dry near a heated stove, and when dry is ready for the last operation, that of firing in the kiln. On being burnt the enamel blends with and becomes an integral portion of the glass plate. There cannot be any question of its durability: as long as the glass lasts it will last. Enamel of any colour can be used, and by careful registering a variety of colours can be printed one after the other, so as to obtain a perfect imitation of a picture. Borders of any description can also be subsequently added without any liability to remove or even diminish the intensity of the colour in the first firing.

It will be at once seen that it cannot compete with original first-class works in painted glass; but those works, on account of the enormous expense attending them, can seldom be introduced

into either public edifices or private dwellings. By M. Joubert's discovery both may now be enriched with works of real art produced by this process. The great merit which it possesses in common with photography is the important one of faithful transcription, the finest gradations of half-tone being preserved if the transfer is skilfully performed. It will be in a great measure dependent upon photography for original subjects, as these can only at a moderate cost be supplied by photography, or by photographic copies of engravings, which in time would be exhausted, apart from any question of copyright.

Such is the process. Its applications are so innumerable, and open out such a vast field for their employment, that, though not overlooked, we think they have been scarcely sufficiently appreciated. Whether or not "good pictures are the best of sermons," as some have asserted, they certainly are refreshing and agreeable to the eye; and the day of ground-glass windows which meet us at every turn, in every dwelling, is doubtless doomed. Disagreeable views may now be shut out by agreeable ones. Staircase windows may be made to open out a fairy land to children—library windows secure privacy and repose by means of an imperishable gallery of portraits of our friends and contemporaries. The lower panes of a conservatory may exhibit for our instruction and amusement scenery of the lands from which the exotics around us were brought. For the dining-room appropriate pictures might be selected, such as flowers, fruit, or game subjects, so disposed as to harmonise with the decoration of the room. Glass panels of cabinets and chiffonniers may have an appropriate device or coat of arms. But it is in the adornment of public buildings that it can be most systematically and appropriately carried out. In such cases a set of original negatives should be taken; and, though an incessant outlay is incurred, yet they admit, like other photographic processes, of infinite multiplication. Or, if an elaborate design or coat of arms be drawn at some expense, it can then be reproduced at will. And what is more appropriate for the splendid mansion or nobleman's castle, alternating with picturesque views of the grounds or estate, and places of interest in the county in which it may be situate? In every building there are windows which must, whether from necessity or choice, be "stopped out," and such as these will now afford opportunities for additional and appropriate embellishment. For an ecclesiastical or educational establishment appropriate subjects may readily be found; for an army or navy club-house, battle pieces; for a royal yacht club, marine subjects; for the "Travellers'," scenes of foreign travel; for buildings devoted to scientific societies endless subjects present themselves, suggestive, stimulating enough; for the civil engineers, feats of engineering skill—the tubular bridge over the Menai Straits, and so on. We hope to see no public edifice erected in future, from the new Foreign Office downwards, without this beautiful means of decoration being utilised.

ON THE ACTION OF IODINE IN THE SILVER BATH.*

By L'Abbe Laborde,

Professor of Physics at Pigwelin.

We generally try to give the greatest possible sensitiveness to the impressionable film; and one of the most efficacious methods of so doing is to make use of a silver bath saturated with iodide, and perfectly neutral. But even this neutrality exposes us to a danger into which we infallibly fall, if at the same time we direct all the other operations towards an extreme sensitiveness: a general mistiness covers the proof, and shows itself principally upon the "reserves." I call "reserves" the parts of the proof upon which the light has *not* acted. I find this expression very convenient, because it denotes without confusion, by one word, the same effects which, upon the glass, are called whites in the negative proof and blacks in the positive. We must then be prepared to lose some of the sensitiveness, either in modifying the whole of the process or in giving to the silver bath a slight acid reaction.

I have discovered a new and very easy means of putting it in practise, and which, while completely preserving intact the sensitiveness of the impressionable film, gives great purity to the reserves. This method consists in introducing some iodine into the silver bath, previously saturated with iodide of silver, in the proportion of about 1 part to 200 of liquid. It must be stirred from time to time, and, after contact for twenty-four hours, a silver bath which previously fogged the proof is in a manner regenerated.

The ordinary laws of chemistry can hardly be applied in this case, or rather we must search more deeply into those laws to find an explanation. Indeed every chemist believes that the iodine, when in contact with the nitrate of silver, absorbs the silver and sets the nitric acid free: this acid will then act like most of the other acids in opposing itself to the reduction of the silver upon the reserves. But I observe that the prolonged contact of the iodine with a silver bath, well saturated with iodide of silver, does not make it lose its neutrality: I have even been able to subject the silver bath containing the iodine to boiling heat, without discovering the slightest acidity. It is a method to be employed if we wish rapidly to obtain all the effect of the iodine upon the silver bath.

However, when iodine has lain from fifteen to twenty days in the bath, a yellowish tinge is remarked upon the surface. The liquid sometimes then possesses a slight acid reaction; but this is owing to a secondary action, which must be attributed to the air which has entered into the silver bath—indeed the yellow tint manifests itself by marks which correspond to crystals of iodine where the imprisoned air has been drawn into the liquid; and if a bubble of air be seen fixed on the surface of the iodine, it will be remarked, subsequently, that it will have disappeared, and have been replaced by a yellow spot. In making the experiment in a flat basin that is inclined in such a way as to put the iodine in contact both with the air and the liquid, some of the iodide of silver is formed around some of the particles of iodine, and the bath loses its neutrality. We therefore understand that the iodine should be plunged entirely into the liquid, and that it is better to withdraw it when it has produced all the expected effects. It is easy to restore the neutrality to the bath by adding to it some carbonate of silver. An excess of carbonate of silver can even be left in the argentiferous liquid without its losing any of the properties which it owes to the presence of the iodine. This fact proves more decidedly that they are not owing to the presence of nitric acid; for we should not know how to admit in the same liquid the continued existence of two substances which mutually destroy each other. On the other hand, we know that the smallest proportion of nitric acid very much diminishes the sensitiveness, and, however little too strong the dose may be, the proof becomes flat, because it refuses to appear under the developing agent.

The effects are different when the nitrate of silver is not saturated with iodide of silver: the iodine unites with the silver, and sets the nitric acid free; the iodide of silver dissolves in the argentiferous liquid, which in a short time becomes very acid. We may completely neutralise it by carbonate of silver; but it is much better to dissolve the iodide of silver in the nitrate, and only to add the iodine after complete saturation.

The effect of iodine in the silver bath consists, I think, in preventing that spontaneous reduction upon the sensitive film which often happens without the action of light. The silver first reduced attracts the remainder of the nitrate under the developing agent, without any very marked preference for the impressed portions when the first reduction has been rather strong. There results from this a general fogginess, which does not really cover the image, since it existed previously, and was formed as soon as the image. It is apparent from this how important it is to prevent such fogginess.

I have remarked that, with this modification of the silver bath, the proofs are with difficulty solarised. To arrive at that stage the ordinary limits of exposure must have been much exceeded. I am sure that we often attribute to solarisation that which in reality arises from the subjacent mistiness of which I have spoken. We then lessen the time of exposure, and involve ourselves in a difficulty from which we do not escape, except with but indifferent proofs in our possession.

Photographers have known for a long time that they must almost always attribute to the silver bath those imperfections which annoy them so much by the obstinacy with which they re-appear. In iodine they will find a powerful auxiliary in avoiding the greater part of these difficulties.

[At the conclusion of the paper M. Regnault observed that the fact announced by M. l'Abbé Laborde was very curious in a chemical point of view, and that it would be interesting to examine into it more closely. He requested MM. Davanne and Girard to study the point.]

* From *Le Bulletin de la Societié Francais Photographique.*

Herr Liesegang, of Elberfeldt, has just published a *Handbook of Photography* in the German language. It is not a mere manual, but a book of considerable bulk, containing an introduction upon the construction of various kinds of lenses, followed by the practice of the collodion process—both positive and negative—printing and toning of paper positives, stereoscopy, &c.

NOTES OF A PHOTOGRAPHIC TRIP TO THE ORKNEY ISLANDS.

By John Traill.

[Read at a Meeting of the Edinburgh Photographic Society, on July 17th, 1861.]

One Friday morning in June, 1860, saw me embarked on board the *Prince Consort*, a noble steamer which plies weekly between Granton Pier and Shetland, calling at Aberdeen, Wick, and Kirkwall, *en route* for Lerwick. Mr. James Munroe gave me his pleasant company on this tour. Kirkwall, a town in the Orkney Islands, was the place of our destination; and the wind being fair, Edinburgh and its attendant hills soon disappeared from our sight. The great number of passengers for the Northern ports, especially Kirkwall, very much surprised me. Believing, as I had been led to do, that I was going to a place inhabited by a race of semi-barbaric natives, who spoke Norse, subsisted by fishing, and were as much at home in the water as on the land, I could not well conceive what motive induced so many respectable people to visit these islands; for, so far as a slight inspection of the passengers' luggage could inform me, I was satisfied that my friend and I were the only photographers among the numerous company.

Sea sickness kept me below until Saturday morning, when Mr. Munroe called me on deck to see a shoal of whales disporting themselves about a quarter of a mile from the vessel. I found we were now off the Orkneys, having crossed the eastern mouth of the Pentland Frith, which divides these islands from the mainland of Scotland. The morning being fine, and the sea as smooth as glass, the first sight of these islands was everything that the most enthusiastic tourist could desire. On passing a little island called Cobinshay—one side of which was a grassy slope, the other a frowning precipice, inhabited by myriads of sea-fowl—our photographic enthusiasm rose to such a pitch that we at once determined to have a flying shot at it with the camera; but, such was the rapidity of the steamer's movements, that long ere we got our "traps" unbuckled, this picturesque island was left far behind. Winding our way in among the islands, we, shortly after mid-day, cast anchor in the Bay of Kirkwall, on an inlet of which is situated the town itself.

Landing, and proceeding up its long narrow street, I confessed to a feeling of something akin to disappointment when I found that, with little exception, it presented just the same appearance as others of our Scottish towns similarly situated; and, instead of my ears being regaled with the harsh Norse language, found that English, pure and undefiled, was exclusively spoken by all classes. The inhabitants, instead of being the semi-barbarians we had calculated upon, had a shrewd, intelligent, and, in some cases, even a refined appearance. "Comparisons," they say, "are odious;" but the inhabitants of Kirkwall will certainly, in mental and physical qualities, contrast very favourably with those of Edinburgh.

A letter of introduction to Mr. ——— secured me the acquaintance of that gentleman during my stay in Orkney; and both to him and Mrs. ——— I was much indebted for an account of the most notable subjects for photographs in these islands, with (what was also of great importance) the best points of view under particular circumstances of light, together with other little bits of information which can best be appreciated by those who are similarly situated as we were. Those of the members who are about to pay a photographic visit to a strange country would do well to secure an introduction to some intelligent resident, feeling assured that, as in my case, they will by such procedure save themselves a world of trouble in the selection of views, &c.

The town of Kirkwall, although unpretending in the main, still presents some notable features. It contains St. Magnus's Cathedral—a magnificent gothic pile, in an excellent state of preservation—the ruins of two palaces, and the remains of a castle.

From the photographs which the Secretary will submit to your inspection as illustrations to this paper, you will at once see the imposing nature of these structures and the architectural skill and sufficient means of these islanders, at even a very remote date from the present times. The antiquity of these buildings may be deduced from the fact of St. Magnus's Cathedral having been erected in 1138. The length of this stately fabric is 226 feet, breadth, 56 feet; height of the main roof, 71 feet, top of steeple, 133 feet.

Those of our brethren who for months can find morning employment with the camera among the slopes and crags of Arthur's Seat, would, in the far North, find similar employment for years.

A binocular camera for stereographs, and a portable landscape camera for pictures twelve by ten, formed our "tools." We had with us a small supply of albumenised plates, ready excited, and the necessaries for collodion plates, either wet or dry, as circumstances might demand. The lenses with which these cameras were fitted were the ordinary achromatic meniscus ones; and I here give it as my sincere opinion that, for ordinary landscape work, this, if well constructed, is the best class of lens as yet in the market. Goddard's compound periscopic is not a bad lens at all, and gives architectural subjects with the lines mathematically straight; but I prefer a single corrected meniscus by the same or any other good maker.

We got a few good views about Kirkwall, after which we proceeded to a small seaport town on the same island, called Stromness. In the vicinity of this town may be taken some of the finest views in the north of Scotland. Our first visit was to some of the quarries rendered classical by the researches of the late Hugh Miller, after which we began to look out for "subjects." To this we devoted the first day after our arrival, noting the exact spot where the camera was to be placed and the particular hour at which the light falls with most effect on the object to be depicted. There are no old buildings of any interest in Stromness, but the natural scenery is very grand. Fearful precipices, with rocky precipitous islands, coves, inlets, lochs, bays, and similar scenery, are all within a short walk from this place. Here we were fortunate enough to get introduced to Mr. Hay, a lawyer, resident in Stromness, who, possessing an amount of photographic and artistic knowledge with which one does not often meet in such distant regions, was of such service to us that were it not for him we should have had to beat a hasty retreat from that port without a single picture. The way it happened was this:—By one of those accidents which *will* happen to photographers, even in spite of the greatest possible care, a small case, which was inadvertently left standing too near the edge of a rock, containing our collodion, nitrate of silver, and, in fact, all our chemicals, suddenly parted company from us, preferring perhaps to try the wet process on its own behalf at the bottom of the sea. The look of blank despair which was depicted in my friend Munroe's face at this dire calamity will never be effaced from my memory. Apparently nothing now remained for us but to pack up our cameras, dismiss photography from our minds, and make the best of our way south again. It was at this stage that the suggestions of Mr. Hay came to our relief; for, by his assistance, and acting under his advice, we got a complete rig-out of photographic chemicals. Procuring some eggs, we beat up the whites with five grains of iodide of ammonium to each egg. At first the procuring of the iodide of ammonium was about to upset us; but by dissolving common iodine in sulphide of ammonium, and crystallising the product, we procured, by this rough mode of proceeding, a salt which in colour and photographic qualities was superior to much that is sold in Edinburgh. Some silver coins dissolved in aquafortis, of which there is plenty to be had in almost every country town, made a bath solution which, although slightly coloured from the presence of the copper with which the coin was adulterated, produced good pictures not only when new but many months afterwards. A shoemaker supplied a piece of gutta percha, of which a flat bath was soon made by the assistance of a wooden mould. Our friend supplied us with acetic acid, which we added to our nitrate of silver bath in no sparing quantity; for experience has taught me that, in working the albumen process, a liberal dose of acetic acid is not at all objectionable. Having prepared two or three trial plates, which were successfully developed by Mr. Hay, we prepared a stock of plates sufficient to last us for the remainder of our stay in the north, intending to develop them on our return to the south. This course we adhered to; and, notwithstanding the inconvenience of carrying about a great stock of glass plates, I believe it will prove to be one of the simplest. Albumen negatives possess a sharpness, an evenness of texture, a brilliancy, and even a softness, if properly exposed and developed, which will contrast favourably with any dry collodion process extant; while the cheapness of the albumen is in its favour—albumen costing about one penny per ounce. There is no preservative solution required in the albumen process: simple washing with plenty of clean water will suffice. In developing, no weakness or raising of the film need be dreaded: it is as hard almost as the glass itself. Its only objection is the weight of the glass.

We stayed in Orkney for two weeks, during which time we visited several of the islands, of which there are upwards of sixty, only half that number being inhabited. In all cases the inhabitants were kind and hospitable, and the reminiscences of our photographic trip to the Orkney Islands are of the most pleasing character.

ON THE PRODUCTION OF TRANSPARENT POSITIVES, AND ON THE TRANSFERRENCE OF COLLODION.*

By M. Martin,

Professor of Natural Philosophy at the College of Saint-Barbe.

M. Motissier's process has given, in skilful hands, charming results, with the advantage of uniting great delicacy with absolute permanency.

The only drawback is with regard to the colour of the proofs: one is never sure of obtaining a desirable tint.

If the exposure in the camera in printing the positive has been too prolonged, the operator should arrest the development with pyrogallic acid at the instant when there is reason to think that the shadows will not increase in intensity, and when there is no deficiency of details. The reduced silver in this case presents a reddish hue well known to photographers who develop their proofs with pyrogallic acid.

The action of chloride of gold does not entirely overcome this colour; and, if it be not injurious to positives intended for optical experiments, at least it is not advisable for those to be transferred to paper.

The excess of exposure is not the sole cause of the production of this red tint: the presence of an excess of acetic acid in the pyrogallic solution or in that of the nitrate of silver, the employment of a collodion slightly alkaline, the use of a negative too transparent or too hard, produces it equally.

It is not always easy to remedy this defect. As regards the exposure, it is observable that if it be insufficient, the proof will be incomplete in the lights, and will only have lights and shades without half-tone. If we reduce the quantity of acetic acid, there is reason to fear that the white parts will be insufficiently preserved.

Under other circumstances, and by the employment of old collodion, rich in iodide and in ether, with baths containing too much free nitric acid, the reduced silver assumes a grey tone, the image, incomplete in the shadows, is veiled, and presents in its whole aspect, even after the action of the chloride of gold, a bluish grey tone that is cold and disagreeable.

In short, the results are sometimes very beautiful, but always very uncertain.

The following method has for its object the more certain production of the same kind of proofs.

The collodion which I employ is a trifle richer in iodide and pyroxyline than that described in my previous communication; the silver bath is, however, the same.

The plate, sensitised in the ordinary way, is exposed in the camera for a rather shorter time than when intended to be developed wtih pyrogallic acid, and the development is effected instead by means of sulphate of iron.

Silver thus reduced is white, and will only give grey shadows. How can we transform this white into black silver? By pouring on the developed and well-washed *but not fixed* image a saturated solution of non-acid bichloride of mercury: the reduced silver becomes black by the precipitation of metallic mercury. The proof is then carefully washed, and covered with a solution of cyanide of silver in cyanide of potassium.

This solution is obtained by dissolving forty-eight grains of cyanide of potassium in one ounce of water, and adding thereto a sufficiency of a fifty-grain solution of nitrate of silver, until the precipitated cyanide of silver which results ceases to be re-dissolved on shaking it up. The liquid, after filtration, is ready for use.

We may replace the silver salt by one of copper, which gives the same results. Metallic copper which is thus precipitated is black, and gives to the proof a tone altogether like that produced by the silver. In this case I employ the pure crystallised cyanide of potassium of MM. Fordos and Gelis.

We may in like manner substitute hyposulphite of soda for cyanide of potassium, and prepare the solution in the same way, whether with the silver or copper salt. Hyposulphite of soda which has served for fixing negatives developed with pyrogallic acid, and of which the action is exhausted, gives, by the addition of a silver or copper salt, good results.

All the solutions may be used over and over again, especially those of silver, before their efficiency is exhausted.

When we flow either of these solutions over the plate, after the action of the mercurial salt, we see the blacks assume great intensity: nothing more is necessary than to wash well and to fix with fresh solution of hyposulphite of soda. Cyanide of potassium is not suitable for this purpose, however weak the solution, because it whitens the reduced silver.

If the proof is intended to be preserved on the glass, to be viewed as a transparency, it is only necessary to allow it to dry, and to varnish it if it be not already sufficiently transparent.

When it is desired to transfer the proof, it must be carefully washed after fixing, and be immersed for several minutes in water acidulated with sulphuric acid. This last operation is necessary, the collodion having acquired an excessive adherence to the glass.

The same method is applicable to negatives developed with iron, of which the dark parts appear too grey.

* From *Le Bulletin.*

ON THE THEORY OF THREE PRIMARY COLOURS.

By Professor J. Clerk Maxwell.

[When the compound nature of the solar light was first discovered by the illustrious Newton, it was supposed to consist of seven primary colours; but natural philosophers have long since arrived at the conclusion that three only out of the seven are entitled to be regarded as primaries, the remainder being produced by different combinations of these three. The primary colours have been considered as blue, yellow, and red; but certain experiments performed by Professor Maxwell have led him to the conclusion that although the number of the primary colours is really three, yellow ought properly to be placed among the secondaries, being really a combination of green and red—the former colour, green, being entitled to rank as a primary.

The following is an authenticated abstract of a lecture, enunciating these principles, recently delivered at the Royal Institution by the learned Professor.]

The speaker commenced by showing that our power of vision depends entirely on our being able to distinguish the intensity and quality of colours. The forms of visible objects are indicated to us only by differences in colour or brightness between them and surrounding objects. To classify and arrange these colours, to ascertain the physical conditions on which the differences of coloured rays depend, and to trace, as far as we are able, the physiological process by which these different rays excite in us various sensations of colour, we must avail ourselves of the united experience of painters, opticians, and physiologists. The speaker then proceeded to state the results obtained by these three classes of inquirers, to explain their apparent inconsistency by means of *Young's Theory of Primary Colours*, and to describe the tests to which he had subjected that theory.

Painters have studied the relations of colours, in order to imitate them by means of pigments. As there are only a limited number of coloured substances adapted for painting, while the number of tints in nature is infinite, painters are obliged to produce the tints they require by mixing their pigments in proper proportions. This leads them to regard these tints as actually compounded of other colours, corresponding to the pure pigments in the mixture. It is found that by using three pigments only we can produce all colours lying within certain limits of intensity and purity. For instance, if we take carmine (red), chrome yellow, and ultramarine (blue), we get by mixing the carmine and the chrome all varieties of orange, passing through scarlet to crimson on the one side and to yellow on the other; by mixing chrome and ultramarine we get all hues of green; and by mixing ultramarine with carmine we get all hues of purple, from violet to mauve and crimson. Now, these are all the strong colours that we ever see or can imagine: all others are like these, only less pure in tint. Our three colours can be mixed so as to form a neutral grey; and if this grey be mixed with any of the hues produced by mixing two colours only, all the tints of that hue will be exhibited, from the pure colour to neutral grey. If we could assume that the colour of a mixture of different kinds of paint is a true mixture of the colours of the pigments, and in the same proportion, then an analysis of colour might be made with the same ease as a chemical analysis of a mixture of substances.

The colour of a mixture of pigments, however, is often very different from a true mixture of the colours of the pure pigments. It is found to depend on the size of the particles, a finely ground pigment producing more effect than one coarsely ground. It has also been shown by Professor Helmholtz that, when light falls on a mixture of pigments, part of it is acted on by one pigment only and part of it by another, while a third portion is acted on by both pigments in succession before it is sent back to the eye. The two parts reflected directly from the pure pigments enter the eye together, and form a true mixture of colours; but the third portion, which has suffered absorption from both pigments, is often so considerable as to give its own character to the resulting tint. This is the explanation of the green tint produced by mixing most blue and yellow pigments.

In studying the mixture of colours, we must avoid these sources of error, either by mixing the rays of light themselves, or by combining the impressions of colours within the eye by the rotation of coloured papers on a disc.

The speaker then stated what the opticians had discovered about colour. White light, according to Newton, consists of a great number of different kinds of coloured light, which can be separated by a prism. Newton divided these into seven classes; but we now recognise many thousand distinct kinds of light in the spectrum, none of which can be shown to be a compound of more elementary rays. If we accept the theory that light is an undulation, then, as there are undulations of every different period from the one end of the spectrum to the other, there are an *infinite* number of possible kinds of light, no one of which can be regarded as compounded of any others.

Physical optics does not lead us to any theory of three primary colours, but leaves us in possession of an infinite number of pure rays, with an infinitely more infinite number of compound beams of light, each containing any proportions of any number of the pure rays.

These beams of light, passing through the transparent parts of the eye, fall on a sensitive membrane, and we become aware of various colours. We know that the colour we see depends on the nature of the light; but the opticians say there are an infinite number of kinds of light, while the painters, and all who pay attention to what they see, tell us that they can account for all actual colours by supposing them mixtures of three primary colours.

The speaker then next drew attention to the physiological difficulties in accounting for the perception of colour. Some have supposed that the different kinds of light are distinguished by the time of their vibration. There are about 447 billions of vibrations of red light in a second, and 577 billions of vibrations of green light in the same time. It is certainly not by any mental process of which we are conscious that we distinguish between these infinitesimal portions of time, and it is difficult to conceive any mechanism by which the vibrations could be counted so that we should become conscious of the results, especially when many rays of different periods of vibration act on the same part of the eye at once.

Besides, all the evidence we have on the nature of nervous action goes to prove that whatever be the nature of the agent which excites a nerve, the sensation will differ only in being more or less acute. By acting on a nerve in various ways we may produce the faintest sensation or the most violent pain; but if the intensity of the sensation be the same, its quality must be the same.

Now, we perceive by our eyes a faint red light which may be made stronger and stronger till our eyes are dazzled. We may then perform the same experiment with a green light or a blue light. We shall thus see that our sensation of colour may differ in other ways, besides in being stronger or fainter. The sensation of colour, therefore, cannot be due to one nerve only.

The speaker then proceeded to state the theory of Dr. Thomas Young, as the only theory which completely reconciles these difficulties in accounting for the perception of colour.

Young supposes that the eye is provided with three distinct sets of nervous fibres, each set extending over the whole sensitive surface of the eye. Each of these three systems of nerves, when excited, gives us a different sensation. One of them, which gives us the sensation we call red, is excited most by the red rays, but also by the orange and yellow, and slightly by the violet; another is acted on by the green rays, but also by the orange and yellow, and part of the blue; while the third is acted on by the blue and violet rays.

If we could excite one of these sets of nerves without acting on the others, we should have the pure sensation corresponding to that set of nerves. This would be truly a primary colour, whether the nerve were excited by pure or by compound light, or even by the action of pressure or disease.

If such experiments could be made, we should be able to see the primary colours separately, and to describe their appearance by reference to the scale of colours in the spectrum.

But we have no direct consciousness of the contrivances of our own bodies, and we never feel any sensation which is not infinitely complex, so that we can never know directly how many sensations are combined when we see a colour. Still less can we isolate one or more sensations by artificial means, so that in general when a ray enters the eye, though it should be one of the pure rays of the spectrum, it may excite more than one of the three sets of nerves, and thus produce a compound sensation.

The terms simple and compound, therefore, as applied to colour sensation, have by no means the same meaning as they have when applied to a ray of light.

The speaker then stated some of the consequences of Young's theory, and described the tests to which he had subjected it:—

1st. There are three primary colours.

2nd. Every colour is either a primary colour or a mixture of primary colours.

3rd. Four colours may always be arranged in one of two ways. Either one of them is a mixture of the other three, or a mixture of two of them can be found identical with a mixture of the other two.

4th. These results may be stated in the form of colour-equations, giving the numerical value of the amount of each colour entering into any mixture. By means of the colour top, such equations can be obtained for coloured papers, and they may be obtained with a degree of accuracy showing that the colour-judgment of the eye may be rendered very perfect.

The speaker had tested in this way more than 100 different pigments and mixtures, and had found the results agree with the theory of three primaries in every case. He had also examined all the colours of the spectrum with the same result.

The experiments with pigments do not indicate what colours are to be considered as primary; but experiments on the prismatic spectrum show that all the colours of the spectrum, and therefore all the colours in nature, are equivalent to mixtures of three colours of the spectrum itself, namely, red, green (near the line E), and blue (near the line G). Yellow was found to be a mixture of red and green.

The speaker, assuming red, green, and blue as primary colours, then exhibited them on a screen by means of three magic lanterns, before which were placed glass troughs containing respectively sulphocyanide of iron, chloride of copper, and ammoniated copper.

A triangle was thus illuminated, so that the pure colours appeared at its angles, while the rest of the triangle contained the various mixtures of the colours as in Young's triangle of colour.

The graduated intensity of the primary colours in different parts of the spectrum was exhibited by three coloured images, which, when superposed on the screen, gave an artificial representation of the spectrum.

Three photographs of a coloured ribbon taken through the three coloured solutions respectively were introduced into the camera, giving images representing the red, the green, and the blue parts separately, as they would be seen by each of Young's three sets of nerves separately. When these were superposed, a coloured image was seen, which, if the red and green images had been as fully photographed as the blue, would have been a truly-coloured image of the ribbon. By finding photographic materials more sensitive to the less refrangible rays, the representation of the colours of objects might be greatly improved.

The speaker then proceeded to exhibit mixtures of the colours of the pure spectrum. Light from the electric lamp was passed through a narrow slit, a lens and a prism, so as to throw a pure spectrum on a screen containing three moveable slits, through which three distinct portions of the spectrum were suffered to pass. These portions were concentrated by a lens on a screen at a distance, forming a large, uniformly coloured image of the prism.

When the whole spectrum was allowed to pass, this image was white, as in Newton's experiment of combining the rays of the spectrum. When portions of the spectrum were allowed to pass through the moveable slits, the image was uniformly illuminated with a mixture of the coresponding colours. In order to see these colours separately another lens was placed between the moveable slits and the screen. A magnified image of the slits was thus thrown on the screen, each slit showing, by its colour and its breadth, the quality and quantity of the colour which it suffered to pass. Several colours were thus exhibited, first separately, and then in combination. Red and blue, for instance, produced purple; red and green produced yellow; blue and yellow produced a pale pink; red, blue, and green produced white; and red and a bluish green near the line F produced a colour which appears very different to different eyes.

The speaker concluded by stating the peculiarities of colour blindvision, and by showing that the investigation into the theory of colour is truly a physiological inquiry, and that it requires the observations and testimony of persons of every kind in order to discover and explain the various peculiarities of vision.

APPROACHING PHOTOGRAPHIC EXHIBITION AT MANCHESTER.

The following circular is that to which allusion was made in our report of the last meeting of the Manchester Photographic Society:—

PHOTOGRAPHIC EXHIBITION IN CONNEXION WITH THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, THIRTY-FIRST MEETING, TO BE HELD IN MANCHESTER, 4TH SEPTEMBER, 1861.

Committee: Arthur Neild, Nicholas Street, Manchester, Chairman; W. D. Clarke, Hayfield, Stockport; J. B. Dancer, F.R.A.S., Cross Street, Manchester; J. Mudd, St. Ann's Square, Manchester; W. Newsome, R.E., 2, Wellington Terrace, Stretford Road, Manchester; J. Sidebotham, 19, George Street, Manchester; W. T. Mabley, Hon. Sec., 14, St. Ann's Square, Manchester.

SIR,—I beg to call your attention to the above announcement, and to solicit your assistance in the endeavour that will be made to render the Exhibition a complete and trustworthy exponent of the present state of photographic art, and of the steps by which it has attained its now popular and important position. It is proposed by the Committee of Management to organise the Exhibition upon a plan not hitherto, as it is believed, attempted. Their labours will necessarily be great; but they trust with confidence to the co-operation of photographers generally, and particularly they would enlist the assistance of those whose long experience in and patient study of the art have made them acquainted with the many modifications it is capable of assuming. Photography is no longer an art which merely gives us interesting pictures in landscape and portraiture; nor is it a fixed thing, conducted upon one set of established rules, for we now find it applied to a large number of objects and uses, and conducted upon many methods differing materially from each other. It is particularly the aim of the present undertaking to show its capabilities in these respects. At a gathering like that of the members of the British Association, men of all shades of taste and acquirements in scientific pursuits are brought together; and it is thought that, by making the proposed Exhibition the means of showing how photography may be applied to their several pursuits and requirements, a great end will have been attained—not only by affording amusement for the time, but by gaining a more extended patronage of the art, and securing the co-operation of many who are at present totally unacquainted with the wide field of subjects to which it may be made subservient. In the chemistry of photography, also, it is assumed that some good may arise; for, if the proposed design be fully carried out, there will be matter placed before the members of the Association which may attract the attention and secure the assistance of men eminent in that department of physical science. It is proposed, therefore, that the Exhibition shall

embrace all the most interesting features of photography in separate classes, and the following are given to show the principle upon which it is proposed to carry out the design, they being, however, merely examples capable of subdivision or extension:—

I. Present state of the art, as illustrated by views, portraits of eminent persons, &c.
II. The practical application of photography to copying machinery, maps, paintings, statuary, rare engravings, geological strata, &c.
III. The various applications to engraving, lithography, wood-cutting, &c.
IV. The history of the art, as shown by some of the early efforts of Daguerre, Talbot, Archer, and others, with specimens of the various processes, such as daguerreotype, calotype, wax paper, collodion, collodio-albumen, &c.
V. Various experimental processes, such as prints with uranium, platinum, carbon, &c., and numerous curiosities in photography.
VI. Photographs with the microscope and telescope.
VII. The most recent improvements in apparatus.

It is submitted that not only photographers, but those who merely take an interest in the art may assist the Committee materially in more than one direction. Those who do not themselves work at photography may possess and be willing to lend the productions of others, or to canvass their friends for choice or peculiar specimens of the art, and all may assist by encouraging an interest in the Exhibition, and by affording hints or counsel as to the practical carrying out of the design.

A detailed scheme of the rules to be observed by exhibitors will be issued in due time.

I am your obedient Servant,
WM. TUDOR MABLEY, Honorary Secretary.

14, St. Ann's Square, Manchester, May, 1861.

It must not be forgotten that, although Mr. Mabley is Secretary to the Chemical Section of the British Association as well as Secretary to the Manchester Photographic Society, the two offices are *perfectly distinct;* that the Manchester Photographic Society, in its corporate capacity, has *nothing whatever* to do with the forthcoming Exhibition; and that, consequently, as the Society will obtain no credit for a successful gathering, neither will it be responsible for any failure, should such occur—an event which, we may observe, we by no means anticipate.

There is one feature in the preceding circular which we strongly commend to the Royal Commissioners for the forthcoming Industrial Exhibition: we mean the subdivision of photographs into several sub-classes, and still more the judicious intimation that those adopted are intended to show the principle upon which the design is to be carried out as circumstances may render desirable, rather than to be rigidly adhered to. We always regard it as a good sign when principles are firmly upheld, but details accommodated to the wants, or even fancies, of those affected by them.

RE-DISCOVERIES IN PHOTOGRAPHY.

GREAT is Scotch "whusky," but greater still is Scotch "ale," seeing that even in its incipient state of *wort* it can affect the eyes not only of the Edinburgh photographers in general, but of Robert Paterson, M.D., of Leith, in particular, who in the last number of the Journal confesses that he has yet to learn that the malt process, as *discovered (!)* by Mr. Macnair in 1860, is the same as the wort process discovered by "I. J. H." in 1855. Be mine the task of enlightening the Doctor. Everything now depends upon the definition of the word "wort." With us in England it signifies an infusion of malt in hot water, and is commonly called sweet wort *before* the hops have been added, after which addition some call it hopped wort and some bitter wort. The former, or sweet wort, was the kind recommended by "I. J. H." in 1855; and, that Dr. Paterson and the rest of your readers may know the difference between it and the malt infusion discovered by Mr. Macnair, I here subjoin an extract in Mr. Macnair's own words, which I quote from the official report of the transactions on that occasion:—"Mr. Macnair said that he had been lately led to adopt *common brewers' wort* as a preservative coating to a sensitised plate"—one advantage of which was stated to be that it was always to be easily obtained, and at a trifling cost. Now, I opine that no amount of reasoning or quibbling will get over these facts, and that they are facts every one in possession of the journals for those dates may at once ascertain. Hence, with respect to the wonderful "malt" process, or "wort" process (a rose by any other name will smell as sweet), all that I wrote about it before must just remain in *statu quo.* Time at present scarcely allows me to notice all that has been written in reply to my last communication: one topic only will I touch on, and that is the Doctor's denial that he gave forth the "gum-water process" as a new one. Well, perhaps I was wrong in saying quite so much for it; but listen to what the Doctor says himself (I quote from his own paper):—"The process which I am now about to describe is not an entirely new one; but is *new in some important particulars.*" Now, among all my friends and acquaintances there is not one who can discover wherein the novelties consist; for, with the exception of coating with gum, it is much about the same as the other dry processes, viz.:—After exciting, wash (either partially or thoroughly), and then coat with the preservative, whatever that may be. It therefore remains for the Doctor to tell us in what "important particulars" it is new. PETER SMITH.

Cornwall, July 23rd, 1861.

STEREOGRAPHS.

North Wales and Chester Illustrated, by FRANCIS BEDFORD. (Catherall and Prichard, Eastgate Row, Chester.)

WE resume our notice of this very attractive series, as promised at page 368 of our seventh volume; and, first of all, we would direct attention to one subject of a class in which Mr. Bedford has been peculiarly happy in his illustrations—we mean architectural interiors. The slide before us represents THE NAVE OF CHESTER CATHEDRAL—a subject possessing no claims for admiration on account of ornamentation or sculpture of any kind, as it consists merely of a single series of Gothic arches of the plainest type; yet from the treatment an artistic value has been attained. We may remark, *en passant,* that the east window, which though partially obscured by the organ is visible in the distance, is entirely free from the hazy obscurity sometimes so objectionably present in photographic representations of interiors. The bare expanse of the floor is relieved by the solitary figure of a lady, while the bright sunbeams, streaming in from the range of clerestory windows, not only impart an effect of atmosphere truly exquisite, but, falling on the ground behind the figure, light up the former, and give that prominence to the latter which, without the patch of light, would have lost half its value. The delicate half-tones of the shaded side are nicely varied, though harmonious.

Until we put it into the stereoscope we were not a little puzzled at the appearance presented by the sky (!) in a view at *Pont-y-Pair, Bettws-y-Coed, from near the Falls;* but then the mystery was immediately cleared up, for the sky proved to be no sky, but a background of trees, in a dense mass, against the distant hill-side. Three arches of a bridge, the central one of considerable span, across a natural chasm in the rock, form the central features of the composition. In the left and middle foreground the branches of a sturdy oak break up the outline, and the figure of a man leaning over the parapet of the bridge imparts an air of life to the subject.

IN THE PENRHYN SLATE QUARRIES, NEAR BANGOR, does not seem a very attractive title; but, though a mere quarry, it is singularly artistic. The broken masses of slate catching the diffused light at all sorts of angles, reflect those soft pearly tones which shed such an air of repose, while the extreme upper part of the quarry is lit up by the departing beams of the setting sun. In the foreground is a miner's hut (little better than a hole in the rock), and just above it a man is standing, with his back to the spectator.

As an extraordinary contrast to the last-named slide, we may cite an evening scene ON THE ELLESMERE CANAL, LLANTISILIO, *near Llangollen.* This is one of those quiet scenes by which we are always particularly attracted. At the spot delineated the canal winds gracefully round the base of a mound, its sloping banks clothed with vegetation. A precipitous path, protected by a light railing, leads to the top of the mound, which is crowned by a wide spreading elm tree. From the side of the mound juts out a graceful silver birch tree, overhanging the water, and on the opposite bank are three magnificent larches. A rough rustic bridge gives access to the mound, and the vista permits a view of the distant hills which, with the bridge, are reflected in the water.

There are few more interesting objects regarded in the light of picturesque adjuncts to a landscape than a water-mill, and that at TREFRIW, NORTH WALES (No. 168), forms no exception to the rule; indeed, with one exception, we have nothing but commendation to apply to the slide before us, the exception being the *chalkiness* of the falling water, which in consequence of this defect loses both transparency and liquidity of appearance. The distant wooded hills, the little white cottage, the mill works, the wheel at rest and in shadow, the fine clusters of trees and shrubs on the banks of the stream, which is also strewn with huge rounded calcareous rocks, form a highly pleasing combination.

Of all the locally characteristic illustrations, perhaps THE PASS OF ABERGLASLYN, from the Bridge, is one most deserving of notice. The graceful curve of the road in the valley, the huge bare precipitous slate rocks on the right brightly illuminated, the dense mass of coniferous vegetation clothing the conical hill on the left, contrast well with the rugged bare rocks opposite both in tone and character; for though the wooded hill is in shadow, every tree, nay every spray, is visibly defined, yet there is no frittering away of effect by the detail, but all is broad and massive in grandeur. There is a little to be desired in the way of atmosphere, and the outline of the hill is a little too hard; but for all that this slide will be a favourite.

WOLF'S CASTLE, NEAR BEDDGELERT, is the name given to a huge rock supposed to contain subterranean apartments once haunted by a robber chief called "The Wolf." Though there is but little

to interest us in the rock itself beyond the legend attached to it, its "surroundings" make it one of the most picturesque of the whole series. Here is a beautifully-wooded stream, with sinuous course and gentle falls. In this slide there is plenty of atmosphere, and a distant hill recedes most naturally from the view. The water, it is true, is a trifle too solid in that part where the foam rises from the force of the fall; but, nevertheless, this also is a charming slide.

At Pont-y-Pant, in the Lledr Valley, we have a turbulent stream, split into several streamlets by the sharp cutting rocks, and again and again "anastomosing," as the anatomists phrase it; but here, though the whole course of the stream is one mass of white foam, there is a foaminess of aspect about it which leaves the observer in no doubt about its nature, though we by no means intend to assert that it is perfect. The bridge consists but of a series of rough planks laid across from pier to pier, built of still rougher stones piled together apparently without cement of any kind.

There are some fine effects of *chiaroscuro* in No. 186, Pont Aberglaslyn, Beddgelert, and in No. 130, Capel Curig, Moel Siabud, from the hotel gardens; but in some parts of both pictures the contrasts between the lights and shades are too marked for stereoscopic slides, though for this same reason they look more brilliant as single pictures. This is no doubt owing to a little over-development; but we believe that, for stereographs, Mr. Bedford intends using an iron developer on a future occasion, when we may expect the slight defects, as we must regard them in this class of picture, will be avoided. Mr. Bedford is not one to rest satisfied with anything short of the best; and his exquisite neatness of style adds an additional charm to the subjects he delineates, however beautiful they are naturally. Long may he continue to delight us with his productions!

Exhibition.

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[COMMUNICATED.]

Having in our last departed from the numerical order of the catalogue to notice the productions of Mr. Breese, we must somewhat retrace our steps; but before doing so we cannot refrain from remarking that, after a careful perusal of the works of Mudd, Bedford, Vernon Heath, and others, we are more than ever induced to maintain a decided stand against the ignominy so wilfully cast upon our art by the Royal Commissioners for the International Exhibition of 1862. That such works, exhibiting as they do an amount of artistic perception rarely met with in the works of either ancient or modern artists, should be degraded to the position assigned is surely a stretch of official importance which cannot be too strongly deprecated. But from such unpleasant feelings we revert to our subject.

Next in order to the solar pictures are the contributions of Mr. Mudd, of Manchester, eighteen in number; and amongst them *Coniston Falls*, which is not by any means so good a copy as we have seen, being rather over-printed and somewhat flat in the distance. The picture is too well known to require particular description; but its exquisite texture, the light and shade of the weatherworn rocks in the foreground, and the admirable contrast thereby afforded both to the mid and extreme distance, produce a picture almost perfect in its entirety. To our taste the effect is somewhat marred by the water, which, as in other of Mr. Mudd's productions, is not so sparklingly limpid as we hope ere long to obtain it; but the attempt was a bold one, and any defect must be referred to the art itself rather than to the artist. In the *Study of Rocks, Perthshire*, and *High Force Falls of the Tees*, the granulation of the rocks is perfectly rendered; but in the former the water is muddy, and in the latter woolly, but accompanied by an exquisite mistiness at the base of the falls which renders the picture a charming one. The gem of the collection is the *River Greta, Rokeby Park*, though the water is too decidedly black and white; but, as a really artistic production, and exhibiting Mr. Mudd's consummate taste in selecting a proper point of view, we prefer the *Bridge over the Greta, Rokeby Park*—a scene which can hardly fail in the hands of an appreciative photographer in stamping out for him an artistic position. The same may be said of *Goodrich Castle*, which exhibits a minute detail with general breadth of effect and a depth of focus almost unequalled in any of the others. The *Entrance to Bolton Woods* is perhaps the most picturesque of the group, apart from its many other good qualities. The *Mill Stream* is a careful study, which should be placed under the same category as *Goodrich Castle*. *Goodrich Court and the River Wye*, from its extraordinary aërial effect, and the exquisite gradation of distance rendered by the meandering of the river, with the natural misty atmosphere arising therefrom, has nearly all the essentials of a good picture; but the finest effect of aërial perspective is to be found in *Wastdale, Cumberland*, a picture combining great depth of focus and photographic effect with an evident consideration on the part of the artist in selecting his point of view. *On the Calder, Cumberland*, should form a companion to the *Bridge over the Greta*, but the artistic effect is totally marred by the perpendicular trunk of a tree, entirely denuded of branches or foliage, which cuts the picture in two, almost centrally; and the reflections, particularly of the left hand bank in the water, and the shadows upon the trunks of the trees, are opaque, giving an appearance of spottiness. The *Pass of Killiecrankie, Perthshire*, has the effect of atmosphere excellently rendered. *Wastdale Head, Cumberland*, is not pleasing in general effect, though the bridge is picturesque. *Raglan Castle and Moat* is flat, a tendency to which may also be observed in many of the others. The *Old Moat, Chorley Hall, Cheshire*, as also the *View at Worsley, near Manchester*, are not transparent in the shadows, and the *View at Worsley* is very yellow. The whole are by the collodio-albumen process.

Although the comparison is obviously unfair, yet we cannot but think that Mr. Mudd will ere long be enabled to obtain that sparkling freshness of motion and liquid transparency in water which Mr. Breese has attained in his *Powerscourt Waterfall*. The want of such is so far the only drawback to his productions, which, as delineations of the external beauties of nature, are almost unsurpassed in the Exhibition, and tend to place Mr. Mudd in the enviable position of one of the leading photographic artists of the day.

Mr. Francis Bedford, of London, contributes a collection of twenty-seven pictures, carefully and judiciously selected. The whole are extraordinarily meritorious productions, thoroughly artistic in their character, and peculiarly delicate in their gradation, from the highest light to the most intense shadow. The *Excavations at Wroxeter* (Uriconium) are more interesting from their archæological associations than as photographs. The *Interior, Looking East*, and the *West End of Valle Crucis Abbey*, are somewhat deficient in that transparency of shadow which many of the others possess in so remarkable a degree, though in other respects good. The *North Porch of St. Mary Redcliffe Church* is unsurpassable as an architectural subject, exquisite in detail, and the effect of the new work much enhanced by the old buildings being rendered quite subsidiary. *A Study from Nature* is treated in a most artistic manner, and such a subject as any painter might luxuriate in, though it is somewhat under-exposed. To the *Sculpture on the North-West Angle of Wells Cathedral*, we could not award higher praise than that it is an architectural *picture*. The *Chantry in the Nave of Wells Cathedral* exhibits careful artistic perception, full of detail, soft yet vigorous. A few occasional rays of light fall upon and illuminate the delicate carving of the screen, light up the arch mouldings, and thereby relieve them from the distance; in fact, just as a painter would employ the means at his disposal to produce the effect of relief, Mr. Bedford has accomplished by natural means, guided by the perceptive powers of the artist. In the *South Aisle of the Nave of Wells Cathedral* a similar effect has been produced, as also in the *View in the Ladye Chapel, Wells Cathedral*. In the former the effect of distance is finely rendered, and the reflected lights are carefully arranged: the female figure is placed in the proper position, but we think it would have been better if, as in the *Interior of Valle Crucis Abbey*, the back had been turned instead of the face. In the latter the distance is well illuminated; but to obtain this the light in the centre of the picture is too strong, and, as contrasted with the *dark* cluster of shafts supporting the arch, gives a somewhat chalky effect, though the entire picture is stereoscopic in a very high degree. The *Western Screen of Exeter Cathedral* is an exquisite photograph and a *picture*. The *North Porch of Wells Cathedral* shows great recedence: the interior is well illuminated, and the reflected lights artistically managed. The *South-West Door of Exeter Cathedral* is an extraordinary photograph. An accidental ray lights up in a marvellous manner the internal walls; a flood of light tips the salient points of the statuary, rendering the shadows deeper, though the half-tone is carefully preserved; and the granulation of the stone, together with the crumbling effect of the ravages of time upon it, are beautifully indicated. In *Exeter Cathedral from the South-East* the light is rather strong, rendering the shadows too intense, especially from the ivy surmounting the buildings to the left. *Wells Cathedral*, the *North-east Angle*, and *Portion of the West Front*, are architectural photographs, perfect

in every respect, though the *Portion of the Western Screen of Exeter Cathedral* is not so pleasing as the *Western Screen* of the same cathedral, from the plane of the object being nearly parallel to the plane of delineation. The *Vestibule of the Chapter House, Bristol Cathedral*, renders in a wonderful manner the effect of reflected light and aërial internal perspective: the detail of the deepest shadows is clearly indicated, and the peculiarly luminous effect of sunlight fully attained. *At Ilfracombe, North Devon*, is a geological photograph, exquisite in texture. *At Lynmouth, North Devon*, is a fine picture, but somewhat flat and marred by the straight line of a rope running diagonally across it from the lower corner to the yard of a mast nearly in the centre of the picture. *In The Valley of the West Lynn, Devon*, is somewhat foggy. *On the West Lynn, North Devon*, has more the appearance of a carefully-finished drawing than a photograph, though the water is not limpid. Two views of *Cheddar Cliffs, Somerset*, are valuable in a geological point of view, and the position of the figures well chosen; but one, a ravine, has too much top light. *The Beach at Lynmouth, North Devon*, weed-grown boulders, is tame; but *Rocks on the Beach at Lynmouth*, a similar picture, is much more lively.

Mr. Bedford's interiors are far the best of his productions: the reflected light in all cases is *soft*, and a sound artistic judgment has been displayed by him in the selection of his subjects. Of their photographic merits little need be said: with the exceptions previously named, they are all high-class productions, rich, fresh, and brilliant in tone, full of detail, and especially noticeable from the exquisite transparency even of the most intense shadows — a quality which few other pictures exhibited possess, if we except those by Mr. Vernon Heath; and, in contradistinction to the works of Mr. Mudd, they are all by the collodion process.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

[Notice.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

WAY'S ELECTRIC LAMP.

As it has lately been demonstrated, at a meeting of the London Photographic Society, that positives can be produced from negatives by development printing, after an exposure to the very actinic rays that proceed from an electric lamp, furnished with poles of mercury, we purpose giving a description of the apparatus employed on that occasion.

In the electric lamps hitherto employed the poles have consisted of little bars of carbon, as the object has been to obtain a source of illumination, assimilating as much as possible in character to that of the sun; and a powerful electric current, passing between two carbon points, affords a white light of great intensity. After the carbon poles have been brought into contact so as to establish a current of electricity between them, they are separated, and then have to be kept at a certain distance apart; for if this distance be exceeded the light is extinguished, the current being wanting in power to jump across a gulf of more than a given extent. In consequence of particles of carbon being carried over with the passing current from one carbon point to the other, one pole decreases in size, whilst the other increases, but in an irregular form. It has therefore taxed the ingenuity of many scientific men to invent mechanical means of keeping up a *continuous* light between the carbon terminals of a galvanic arrangement. Of these contrivances the lamps of Duboscq and of Serrin are regarded as the best, though we have seen one constructed by an amateur that is very efficient.

Mr. Way, however, deviating from the ordinary track, has obviated the necessity for complicated mechanical arrangements by adopting poles of the *liquid* metal mercury. The light obtained from this source is totally different in character from that furnished by carbon poles, both in its colour and apparent magnitude; and as it is visible at a considerable distance, it has hitherto been employed chiefly for lighthouses. Its richness in blue and violet rays, however, particularly recommends it for photographic purposes, if the expense and trouble attending the fitting up thirty or forty of Grove's cells can be diminished, or is not a matter of consideration.

Way's lamp is extremely simple in arrangement. It consists of a hollow conical iron jet, connected by a flexible tube with a reservoir of mercury: this jet stands over the centre of a small shallow iron funnel, of small bore, that is adjustible to any height by a rack-and-pinion movement. To the end of the funnel is attached another flexible tube, in connexion with a receiver. The jet is connected with the positive pole, and the funnel with the negative pole, of a series of thirty of Grove's or Bunsen's elements. On contact being made with the battery the mercury is allowed to flow from the jet into the funnel, the distance between the two, for securing the best effect, being obtained by means of the rackwork adjustment. By this means a current is established between the two mercurial poles, the mercury is rendered incandescent, and a small portion is volatilised. As the fumes of this metal are noxious, this part of the apparatus is enclosed in a closely-cemented glass shade to prevent their escape. It has been objected that in consequence of these mercurial fumes being generated it is a dangerous instrument to employ; but the same may be said of a gun or a steam engine, and many other useful contrivances, and with truth—*if* we do not follow the precautions that experience and common sense indicate. To produce or extinguish the light, it is only necessary to make or break contact with the battery, the flow of the mercury not being interfered with.

The mercurial reservoir and receiver next claim our attention. This part of the arrangement is, in principle, like an hour-glass. It consists of two hollow iron balls, connected by a tube, suspended by an axis on a frame in such a way that either ball may be brought uppermost. The upper ball that contains the mercury is, for the time being, the reservoir, and is connected with the jet of the lamp. The under ball, on the other hand, is in connexion with the steel funnel of the lamp, and forms the receiver. Stopcocks and a guage are fixed at suitable points of the apparatus. When the upper ball or reservoir is exhausted the lower ball has become full, the stopcocks are turned, the arrangement rotated on its axis, and what was the receiver becomes the reservoir—the connecting tubes being, at the same time, changed from one pole of the lamp to the other.

At least such was the apparatus exhibited at the last meeting of the London Photographic Society; but as the reservoir and receiver then employed was constructed for experimental purposes in determining certain points in the construction of a perfect arrangement, it was far more complicated and costly than there is any necessity for in photographic practice.

The lamp itself is as simple as it can be, and all that is necessary for a reservoir is an iron bottle with a funnel of iron, porcelain, or gutta-percha fixed into its neck, and a piece of iron tube terminating in a stopcock screwed into its lower end: a piece of flexible tube attached to the stopcock connects the reservoir with the jet of the lamp. This reservoir is then fixed (on a shelf or a retort ring arrangement) at such a height as to secure a sufficient pressure of the liquid metal. Another piece of flexible tube attached to the termination of the iron funnel or cup of the lamp is passed into the neck of another iron bottle placed on the ground that acts the part of receiver. When all the mercury has passed from the reservoir through the jet and funnel of the lamp into the receiver, the contents of the lower bottle are poured back into the funnel of the upper bottle or reservoir. Nothing can be simpler, and the expense of such an arrangement *need not* be very much. The cost of the battery and of the mercury would be the principal items.

The mercury issues from the jet in a fine stream: for a certain distance it descends in a solid column, and then breaks up into little beads. The light emanates from this point of disruption, and the nearer this occurs to the jet the brighter is the light. Until the glass shade that retains the fumes has become warm, the mercury condenses on its surface so as greatly to impede the amount of light given off; but after a certain temperature has been attained the glass remains free from any deposit, the heat of the incandescent mercury being very considerable.

Whilst Duboscq's lamp requires forty of Grove's cells, Way's light is found to give the best effect with thirty. But it is a curious fact, as yet unexplained we believe, but probably dependent upon one arrangement requiring *quantity* and the other *intensity* effects, that Way's light cannot be worked by the magneto-

electric machines that have lately been employed in place of voltaic arrangements.

The peculiarities of Way's light have already been given at page 224 of this Journal.

MEAGHER'S BINOCULAR CAMERA.

Mr. Meagher has just introduced a compact form of stereoscopic twin-lens camera that embodies some improvements. It is a bellows-bodied camera, with a screw adjustment. The handle that turns the screw motion folds up so as to occupy less space when the instrument is packed, as the handle is permanently attached to the screw itself to provide against its being mislaid. At first sight, this plan appears very good, but we think it may prove objectionable in practice; for if, when the exact focus has been obtained, the handle should project above the base-board, it stands a great chance of being disturbed, and of the focus being consequently altered. There is no reason, however, why the folding handle should not be made to fit on to a square key at the end of the adjusting screw, and then be fixed by a small binding nut at the side, so as to allow of the handle being readily removed when desirable. The back is made to swing in one plane by means that will be understood on inspecting *Fig.* 1. The

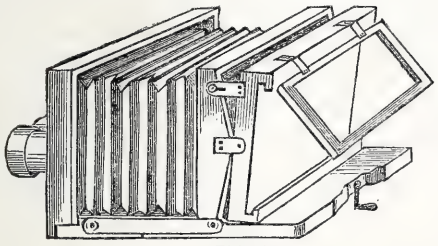


FIG. 1.

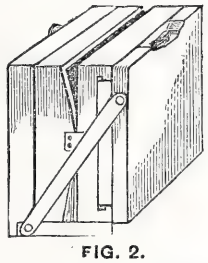


FIG. 2.

focussing glass is permanently attached to the camera by hinges, so that it can be turned back over the top when not in use. This provides against chances of breakage, as it is too often the fate of focussing glasses to get smashed whilst lying about during the time the picture is being taken. When the bellows body is shut up, the end of the base-board folds up over the back of the instrument so as to protect the focussing glass, as is shown in *Fig.* 2. This arrangement demands some ingenuity, as the base-boards of cameras focussed by endless screws have hitherto been made in one piece. Mr. Meagher has, however, got over this difficulty thus:—The upright back frame is attached to a small block of wood fitted with a female screw, that works from one end of the base-board to the other, between grooves, by means of the male focussing screw. When this portion, together with the bellows body, is screwed *quite* "home" into the front portion of the base-board, the male focussing screw becomes released from the female screw at a point where the hinge intersects, and the end of the base-board is then free to turn up. When the board is again lowered, the end of the male screw just drops into the mouth of the female screw, a spring assisting the action by pressing the traversing block forward. A turn or two of the handle secures a bite, and the bellows body is then drawn out to any extent required. The two portions of the folding base-board are made solid by means of two side bars that clamp on to pins after the manner shown at page 224 of the previous volume of this Journal; but in this case they are made to project *above* the sides, so as to serve as "guides" for the back frame to work between. They also serve to bind the camera together when packed up, as shown in *Fig.* 2.

The instrument has a focussing range of 3½ to 7½ inches; is fitted with one single and three double backs; and the whole packs into a leather case that measures nine by seven inches and six inches high.

Meetings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met in Queen Street Hall, on the evening of Wednesday, July 3rd. George H. Slight, Esq., Vice-President, occupied the chair.

Mr. Thomas M'Dowell was admitted as a member; after which Mr. Campbell exhibited a number of stereographs of various kinds.

An animated conversation was entered into on photolithography and the tannin process. As regular papers on these subjects are expected to be read before the Society at an early date, our reporter has not furnished us with further particulars.

The above Society met again on the evening of Wednesday, July 17th, when the chair was occupied by George H. Slight, Esq., Vice-President.

After the minutes had been read, the following gentlemen were admitted members:—C. M. Musgrave, Charlotte Street, and R. Hamilton Bell, 30, Royal Circus.

The subjects of papers for a few future meetings were arranged and allotted to various members; and it was agreed that during the remainder of the summer months papers should only be read at each alternate fortnightly meeting, the intermediate meetings being devoted to general conversation on photographic subjects.

A paper *On a Photographic Tour to the Orkney Islands*, by Mr. John Traill, was then read. [See page 269.]

A vote of thanks was awarded to Mr. Traill.

Among a variety of topics suggested by the paper, that of nitrate of silver baths made of gutta percha and other substances was discussed at some length. It was deduced from the remarks made that pure gutta percha had no action on the silver solution, but that a considerable proportion of the gutta percha in the market contained impurities which had a very prejudicial action on the silver; and it was recommended that all baths should be coated both outside and inside with shellac varnish.

Mr. Musgrave related an incident which had occurred to him some time ago in connexion with this subject. A bath which had been for some time in use, but had become deteriorated as he thought from contact with impure gutta percha, was boiled down by him with a view to concentration. Although previous to being boiled the liquid was filtered, yet it had not been long in the retort ere he discovered a scum on its surface, which on examination was found to consist of gutta percha; and it was afterwards found that a considerable quantity of that material had been held in solution by the silver bath.

After some interesting remarks by Mr. Nicol on this subject, Mr. Bow stated that, some time ago, seeing in a list of the uses to which silicate of potash or water-glass might be put was that of cementing glass, he had tried some experiments with a view of making baths of glass plates and cementing them with this substance; but, from whatever cause it might arise, it had been unsuccessful.

Mr. Musgrave then exhibited some pictures of Holyrood, Roslin, and other places. These were of a very fine tone, and possessed alike of vigour and detail. One of these—a large view of *Roslin Chapel* of great beauty—he presented to the Society. The negative of this was taken by the tannin process under somewhat disadvantageous circumstances.

Mr. Ramage then exhibited and presented to the Society a number of photolithographs from engravings. The members designated these as the finest specimens of this art which they had yet seen.

The thanks of the Society were awarded to Mr. Musgrave, Mr. Ramage, and the Chairman.

Photographers in "Trouble."—At the Police Court, Liverpool, on Saturday last, Samuel W. Cayley and Louis Erpicum, a Frenchman, were committed for trial (but were afterwards admitted to bail) on the charge of having stolen, or being concerned in stealing, a valuable photographic lens, value £40, the property of Mr. P. C. Stortz, photographic artist, Liverpool. The prisoners had previously been examined before the magistrates at Llandudno, where they were taken into custody, and by them ordered to be brought to Liverpool. Cayley carried on business at Llandudno (in partnership with a Mr. Cazenave, also a Frenchman, formerly in Mr. Stortz's employ) as Cayley and Co., and Erpicum was their assistant. The lens was found by the detectives concealed between a bed and a mattress on the premises of Cayley and Co. Erpicum, who had also previously been in the service of Mr. Stortz, was found in that gentleman's studio on the day the lens was missed, though having no business there; hence suspicion fell upon him, and the detectives were soon upon his track to Llandudno, with the result stated above.

By the recent census taken in Paris, it appears that in that city alone there are no fewer than 23,000 persons engaged professionally in some branch or other of photography.

The necessity of special arrangements for successfully photographing horses, dogs, cats, birds, and other pet animals has induced some adventurous Parisian to get up a photographic establishment in France for the special purpose. We shall perhaps ere long, at home, see such announcements as the following:—"The quadruped photographic establishment!"—"full lengths and vignetted heads!"—"*cartes de visite*, &c.!"—"spacious dressing rooms, attendance, &c.!"

A correspondent of the *Athenæum* recently writing from Munich says:—"An important scientific work is in course of issue in Munich—*A Photographic Atlas of the Nervous System of the Human Frame*. The photographs are taken by Herr Albert, the Court photographer, and are done with clearness and precision. There is an explanation published with the plates, in German and French, by a Professor of Anatomy; and the work is to be completed in ten parts, each part containing five plates, and costing about 11*s.* 6*d.* The first part is published, containing the nerves of the head, which stand out as plain and fine as a spider's web in the photograph. The importance of such a work for students of anatomy can hardly be exaggerated; and as I believe nothing of the kind is already in existence, it is a great honour to Munich to have led the way."

Notes of the Month.

"JULY weather" has ceased to be a term suggestive of long sunny days, succeeding each other with some degree of regularity. The fall of rain, as registered by the Royal Society, is most unpleasantly approximate to that of the corresponding month in 1860. "Out-door" work has only been accomplished by means of dash and spurt. To those of the photographic ranks who go on "foreign service" it has been very irritating, and they of the "home-service" brigade have had more than enough.

The want of a good and reliable photographic paper is felt as keenly as ever. Complaints meet us at all hands, and in every direction. It is said that there is no such paper in the market as we had two and a-half years ago, and that there has been a marked deterioration going on ever since. Those renowned for the beauty of their prints speak of it almost with consternation, and as having to sustain their position at the expense of great waste. We know of one of the most eminent firms in Regent Street which has fallen back upon the "cuttings" of former years, wherever the size will admit of it. From one house we can only get thin albumenised paper *to order*, as from its porous, inferior nature it will not keep any time when albumenised, and cannot be kept "in stock." The reply to inquiries as to the cause of this is, that the demand has so increased that continental manufacturers have no inducement to produce a *good* paper; for whatever stuff they make there are more than enough buyers, and we are *wholly* dependent on foreign sources for photographic paper. What a deplorable and humiliating state of things! One firm is going to offer a gold medal, of great value, at the Exhibition of 1862, for the best photographic paper by an *English* manufacturer.

Verily the French are a great people! They carry by masterly *coup d'etats* what we slow deep-hearted northerners go round-about-ways to accomplish. To write letters *in forma artistes*, and solicit sittings from public men, make appointments, &c., occupies much time and expense. An enterprising French photographer has established himself and his "machinery" on the river terrace in front of the House of Commons, with the view of inducing the members to have their portraits taken for a parliamentary album, to contain the effigies of the 654 honourable gentlemen. Whenever the little Frenchman beholds a member, he rushes up to him, takes off his (the member's) hat, places him in a position in front of his machine, and beseeches him in the worst imaginable English to stand at ease "for just one small moment!" It is pleasant to witness the genial manner in which the legislative mind unbends itself, and submits to the importunities of the artist. There is, of course, nothing to pay, which, perhaps, accounts for the success which has hitherto attended the parliamentary album.

At a special meeting of the Council of the Photographic Society, which took place at King's College on the 8th ult, when the replies to the letters addressed to the various provincial and foreign societies were read, the Lord Chief Baron Pollock advised that no further step should be taken until after the recess. There would be little done during that period as to arrangements, &c., at Kensington, and in the meanwhile that which would not be yielded to clamour might be quietly conceded—at any rate, it would then be time enough to consider what course to pursue. Thus the whole matter remains in *statu quo*.

But an oracle has spoken! Great is machinery, and Silvy is its prophet!! A gratuitous mandate from the court enthroned at Bayswater was read at the meeting above referred to, and excited no little amusement, and—*perhaps*—consternation. In it the claims made upon the Commissioners by the Council of the Photographic Society were denounced, M. Silvy stating, at the same time, that he had "*demanded*" the "*favour*" of having his productions placed in the *mechanical* department, and also announced that if this piece of gratuitous advice were not acted upon he should withdraw his illustrious name from the roll of the Society. The amusement was not diminished by the President quietly raising his head and naively inquiring—"*Who is Silvy?*" We forbear comment. M. Silvy, however, must not expect to treat the photographic world with the same imperialism that he exhibits towards his sitters. Commercial success does not constitute any man an authority. It is amusing to see the letter admit, by implication, a want of "thorough breeding." To have made the analogy he suggests perfect, and to carry it to its logical conclusions, every locomotive, in the hands of every engine-driver, should invariably arrive at different results. Thus you might be booked —not for a picture—but for Teignmouth, and find yourself landed in the Thames. We have heard that it is *not* true that the meeting at once dissolved in much consternation.

S. T.

Foreign Correspondence.

Paris, July 27th, 1861.

A COMMUNICATION made to the Academy of Sciences by M. Couturier has been much talked of during the last month. According to the little that was said on the subject in the reports of the journals, the paper treated of the obtaining of indelible photographic pictures upon porcelain by means of silicates and aluminates. I wished to have more ample information, and after many researches I discovered the writer of the communication, which is now before me.

M. Couturier employs photographic plates engraved by M. Nièpce de Saint Victor's process, or by any other. He takes from them pictures upon paper, which he applies to the porcelain, and then covers with a silicious coating more or less fusible. They are then exposed to a suitable temperature. With silicates and aluminates he forms the unctuous ink which he spreads over the photographic plate with the roller or the dabber. To procure the silicates, the silicic acid contained in a soluble silicate of potash or of soda is precipitated by one or several of the soluble salts of copper, iron, gold, pewter, platina, cobalt, &c., &c. You have then a coloured silicate which you must put on a filter, or on fine linen, and wash well in order to get rid of the salts of potash or of soda.

The metallic aluminates are prepared by saturating one of the soluble salts of aluminium by one or several of the above metallic salts. The alumen thus coloured is precipitated by means of liquid ammonia, and then well washed. These silicates and aluminates are submitted to a red heat in a crucible, so as to combine the colouring principles in a smaller volume. Mixtures of two or several of each may be made in order to vary the tones. For applying the photographic pictures to the ceramic pastes, the operation is the same as for the reproduction of engravings thereon. In the ink employed for marl or terra-cotta, for opaque and for tender porcelain, only silicates obtained by precipitation are employed, with a very small quantity of aluminates, on account of the infusibility of the latter. For hard porcelain the silicates and the aluminates must be mixed in about the proportions in which they are found in the composition of the porcelain itself. The colours are lively, and may be mixed like the tones of a palette.

M. Liais has just given to the Academy of Sciences a paper in which photography figures. This astronomer, having a series of photographic views of the solar eclipse of the 7th of September, 1858, which he took in the Bay of Paranagua, has made use of them for determining the longitude of that place. The result is such as to lead him to recommend the adoption of this means to others.

At the Exhibition in the Champs Elysées much attention has been excited by a series of reproductions from the antique, executed, under special circumstances, by M. Joly-Grangedor. They form part of a considerable work which that artist will publish shortly, and which will do great honour to photography. M. Joly-Grangedor, who is a painter, had long been impressed with the insufficiency of the lithographed or engraved models given to pupils in the schools of design. Photography offered a means far superior as to execution; but it was necessary that the subjects presented for study should be selected, lighted, and interpreted under special conditions. This M. Grangedor has done. He has chosen the best types of antique sculpture—heads, busts, fragments—and he has reproduced these under the most artistic aspect, and with the most artistic effects of light and shade. As a further aid, the same subject has been executed several times, so that the student may seek at first only the outlines, then the masses, and finally the most complete modelage. The operation of photography has been made, as it were, to coincide with that of pencil. This series is at once a course of drawing lessons and a most interesting album; for the author has placed, side by side with the masterpieces of ancient statuary, the finest productions of the Middle Ages and of the Renaissance. These beautiful pictures are printed by M. Poitevin's new charcoal process.

The *Galerie des Hommes du Jour*—a publication with letterpress and portraits by Pierre Petit, of which I have already said a few words—is about to be continued with M. Poitevin's process. This process, which is so simple and which gives such remarkable results, will no doubt be soon applied to other works of a similar character, destined to become precious documents in our archives and libraries.

Mr. H. Petschler, who was in Paris a few days since, showed me a large number of pictures obtained on glasses prepared long be-

forehand, and preserved by his process, which THE BRITISH JOURNAL OF PHOTOGRAPHY has already made known. These landscapes, taken mostly in Derbyshire, much interested me, not only as specimens of a particular method, but likewise on account of their execution. I was struck especially by the clear light shed over all parts of the picture—you feel that the air is circulating freely there—and by the exquisite finish of the details, which detract nothing, however, from the harmonious aspect of the whole.

The *séance* of the French Society of Photography, which was held on Friday, the 19th inst., offered nothing very new. The principal topics of conversation were the Exhibition at Marseilles, where we hope to see the works of many English artists, and the preparation for the Universal Exhibition at London. We have every ground for believing that photography will figure there with honour, whatever be the place allotted to it. ERNEST LACAN.

New York, June 29, 1861.

I HAVE just risen from the very pleasant occupation of examining the European journals of June 15th, which reached us yesterday. I was especially entertained by the report of the meeting of June 4th of the Photographic Society of London, and especially amused by the declaration in the *Notes*, on the alleged authority of Mr. Ross, that "Mr. Harrison's new lens is a transparent absurdity!"

In the Photographic Society you had a very interesting exhibition and discussion of Way's electrical light. This variety of electrical light, as far as I am aware, has not yet been exhibited—at least in any public way—in this city. The old carbon light and the incandescent platinum light may be seen any day. We are getting here to think very favourably of the magnetic electric machine as a substitute for the battery. Several of the machines are in steady and constant use among electrotypists, and give the greatest satisfaction. The builders of these machines formerly fell into the error of supposing that their power would be proportioned to their size. Small magnets are immensely more powerful, proportioned to their weight, than large ones; therefore, to economically "convert" magnetism into electricity, we must combine the products of small machines. Cast-iron magnets, of a star form, alternate points of which are opposite poles, are found here to be very efficient and cheap.

Electrical machinery here has been, for the past few years, a favourite field for inventors. We have a score or two of patents on electrical apparatus, much of which is intended to be used for lighting gas. I caught the prevailing fever myself: I contrived a constant frictional machine. It is simply the ordinary machine enclosed in an air-tight glazed case, the air being kept dry by chloride of calcium. I am inclined to believe that the cheapest and most available electrical light may be produced by static electricity. At all events, photographers *must* have an efficient artificial light. Such a light is the most important *desideratum* of the day—of the night, I mean.

I fully agree with the position taken in the London Photographic Society by Mr. Shadbolt on the depth of focus question and the solar camera.

On the enlarging of photographs we Americans are two or three years in advance of European photographers. The solar camera was patented and demolished a long time before it was even heard of in Europe. If Mr. Sutton and others of his way of thinking are unable to see that a condensing lens, *as used by Woodward*, injures the sharpness of the image, they surely will not claim that it increases the sharpness. Then what advantage in a development process, for which there is plenty of light without any condensation?

Whether a condenser be used or not, it is *necessary*, in order to secure the greatest sharpness, that a translucent screen (the ground glass, for example) be placed behind the negative, and in close contact with it. This screen serves to diffuse the direct and nearly parallel rays from the sun or sky. These rays, if not so treated, will form an image of the sun or sky, more or less in focus, on the ground for the picture. The rays thus stopped by the screen proceed from the negative precisely as if they originated from it. The light is emitted from the negative nearly as if it were diffused light falling on the front. Thus I have reasoned on the subject from the beginning, and a pretty extensive practice has confirmed the deductions of theory.

I have found the mirror of an enlarging camera, which was suitable, to be a very difficult thing to get. The ordinary quicksilver and tin mirror lasts, in our brilliant sun, only a few weeks. The mirrors made by the modifications of the Drayton process ought to last for years. CHARLES A. SEELY.

[The above letter was received too late for insertion in our last number.—ED.]

New York, July 12*th*, 1861.

THUS far, the American photographers have cared very little for dry processes. Probably not one in a hundred have made a trial of the Taupenôt process or the Fothergill. I am not acquainted with half-a-dozen who have made systematic and persistent experiments with dry collodion, and I do not know one who makes actual use of dry collodion. Our photographers make photographs only for the utility there may be in them, and they only care about the easy and certain means of reaching the results. There is very little ambition of discovery—no one works for the pleasure of working. It has thus happened that the most useful photographic processes have in America soonest reached their greatest development, while the theoretical and simply curious are almost wholly ignored. I remember well that, as early as 1855, when the collodion process had been in use here only about a year, the details of the process were settled: facts were determined for us about which there is yet doubt in Europe. European photography has been gradually progressing towards the American system. That I may not be misunderstood, I will briefly state the distinguishing features of our process:—gun-cotton, made at a high temperature; collodion, heavily sensitised, and containg a bromide; a strong nitrate bath; sulphate of iron as the universal developer; weak salt and silver solutions for paper. I do not, of course, mean to say that we have discovered anything beyond the precise value of facts offered to us by others.

One of the most interesting events which have recently happened here is the opening of a new photographic gallery by C. D. Fredricks and Co. For many years it has been a question of debate which (of three or four) was the finest and most extensive photographic establishment in the city. It was a difficult question, and perhaps never would have been put to rest except for the recent *coup d'artifice* of Fredricks. For about a month the proceedings in Fredricks' building were, by means of an immense wooden screen covering its front, shrouded in great mystery. On the screen being taken down, a few evenings since, one of the most gorgeous spectacles burst upon the view of the crowd of people in Broadway. The entire building, four storeys high, twenty-five feet wide, and one hundred deep, is wholly occupied for photographic purposes. The entrance to the building is an arched vestibule thirty feet to the key-stone and twenty feet deep. The vestibule opens into the main exhibition room, which is almost crowded with specimens of photography of every style and size. The ornamentation of the building inside and out is tasteful, solid, and not gaudy. I doubt if there is any sight in the world which will convey a deeper impression of the importance of our art.

I enclose another view by Mr. Harrison's new lens. This picture, as a test, is much more satisfactory than the last, the entire capacity of field being shown. CHARLES A. SEELY.

[We will make some remarks on the two specimens received, in our next.—ED.]

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

[WE have been requested to publish the following, which has already been sent in reply to several inquiries.—ED.]

AMATEUR PHOTOGRAPHIC ASSOCIATION.

To the EDITOR.

SIR,—I am desired by the Referees of the Amateur Photographic Association to state (since from the number of members already enrolled there is no longer a doubt of its success)—

1. That the Amateur Photographic Association is now fully established.
2. That all negatives for this year should be sent in not later than November 1st, and as much earlier as possible.
3. That the Secretary is prepared to negociate exchanges on behalf of all members who may desire it. These exchanges will, as a matter of course, have no reference to the two guineas' worth of prints to be selected by each.
4. That the adjudication of prizes will take place at the close of this year or the beginning of next.—I am, yours, &c.,

A. J. MELHUISH, HON. SEC.

26, *Haymarket, London, S.W., July*, 1861.

THE SOUTH LONDON "REPORT."

To the EDITOR.

SIR,—As Secretary of the South London Photographic Society, I feel it my duty to make some few remarks on your leader of the 15th ult.

In the first place, I must protest against your frequent reference to "the compiler" of the Report in question, which was produced by a Sub-committee appointed by the Managing Committee; and consisted of gentlemen who, collectively and individually, have, I am sure, every feeling of respect both for yourself and the Journal under your management.

The Report having been drawn up was first submitted to the Managing Committee, and then printed for circulation among the Society's members. The paragraphs in question were fully discussed by both committees; and it was our opinion that such important alterations in the constitution of the Society could not, in justice to ourselves or the members, be made without reference to the facts which originated them.

It was, as you state, in consequence of some correspondence between the Society and the Publisher of THE BRITISH JOURNAL OF PHOTOGRAPHY that the latter became the official representative of the former; but it was then expressly stated by the Publisher that as his Journal already published full reports of our meetings, and had been for many months in circulation among our members, it was then, *in all but name*, our official organ, and that the mere public announcement of the connexion could not be a matter of much importance.

Now, the Committee had, up to that time, objected to the nomination of any journal as the Society's special organ, it being of opinion that by so doing it would inevitably subject the Society to claims which, as the Report states, would "tend to cripple the independence of the Society, and retard its influence in propagating and advancing the art;" but no special claims being advanced by your Publisher, these objections were overruled, and THE BRITISH JOURNAL OF PHOTOGRAPHY was formally adopted as the Society's organ. Remembering this, it was stated in the Report that the exclusive privileges since claimed were "never directly or indirectly accepted by the Committee."

You affirm that, "shortly after the *Photographic News* was placed under the management of the gentleman who at present edits it, you were systematically forestalled in the publication of the papers read."

This is a mistake; for, by merely referring to the numbers of the *News* which were published prior to the change in its editorship and management, you will find that not only were the papers and discussions regularly published in that periodical, but that they were actually published on the day following the evening of each meeting—a promptitude which has not been emulated under its present management.

The only reason for my "putting in a claim to revise the reports" arose from anxiety to get the remarks of the various speakers done justice to, and—as you, my dear sir, know—the same feeling influenced me for many months when both your own and the other journals did not send reporters to the Society, and all the labour of providing them rested on my own unaided efforts. Upon the occasion you refer to, I had received no proof of the report previous to its publication, or possibly the errors in question might not have been overlooked.

The engagement meant in the Report was that implied by the terms of subscription. The journals were to be supplied by the year, and their circulation ought—as we, at least, thought—to have stopped either at the termination of the third or the fourth quarter, and not somewhere about midway between the two.

With regard to the "trade interests" mentioned in the Report, and sarcastically echoed in your remarks, if the Committee undertake to supply a certain journal to the members of the Society, it tends, virtually, to increases that journal's readers, and so serves its interests. Moreover, by selecting it from amongst others, it may easily be supposed to publicly advertise its superior merits; and, moreover again, photographers must of course know that the reports of any Society are more likely to be correct and fairly representative in the pages of its own organ than in those of any other journal.

With apologies for the space occupied, I must now conclude by assuring you that, while we were perfectly convinced that the whole affair originated in either a mistake of the Publisher's, or possibly in some misunderstanding *on both sides*, we could not, consistently with the principles laid down for conducting the Society, agree to submit to the conditions recently urged in your letters addressed to the Committee, or refrain from some mention of the same in the Report. We have endeavoured, while steering our little South London bark clear of the shoals and rocks of personalities and undignified squabblings, to advocate the interests and assist the progress of the art itself, with consistent steadiness, and with straightforward honesty and earnestness of purpose. That in so doing we have offended you, Sir, or can be supposed to have insulted anybody, must be, I am sure, a matter of extreme regret to us all, as I assure you it is to yours very truly,

ALFRED H. WALL, HON. SEC.

P.S.—The above is merely a personal communication, written without consulting the Committee, its members being nearly all out of town.

[Being entirely unacquainted with the course adopted, or who were the gentlemen concerned, in drawing up the "Report" to which we alluded, we felt free to make such comments as we thought to be just without being in any way personal. The usual mode of preparing such a report is for *one* individual to draw it up; while those in whose names it is to be issued canvass, suggest, alter, and finally adopt the document: hence we concluded that the original *compiler* had erroneously made charges which the others concerned had carelessly adopted. We think our correspondent's explanation scarcely improves the position assumed; and if (as asserted) the offensive paragraphs were *fully discussed*, we have still greater reason than we before imagined to complain. We cannot regard the deliberate imputation of dishonesty as anything short of *deliberate insult*.

We have no objection to any statement of *facts*, but a very decided one against unfounded imputations. We certainly are not aware of any regularity of prior publication of papers in the *Photographic News* until the accession of its present Editor; and we can safely answer for our Publisher's ignorance of such custom, otherwise he would never have made the offer to insert the Society's name on the title page, and certainly we should not have sanctioned it. As corroborative evidence, our correspondent will surely remember that shortly after Mr. Simpson became connected with the *News* we called upon the former in consequence of our noticing the unwonted prior publication of papers, and *proposed to him that the official representation should be transferred to the Photographic News*, stating that if he desired it we should offer no impediment to such a change. If the papers had been *usually* published in anticipation in our contemporary's columns before, why did we then make such a proposition? In our recent correspondence with the Committee we were informed "that the *only* official representation which it recognised was the circulation of this Journal amongst the members of the Society." How is it possible that such a connexion (only) could affect the accuracy of the Reports? And if no exclusive representation existed, the interference of the Secretary was uncalled for.

During the correspondence we discovered that as regarded the unwritten arrangement then in force some misapprehension appeared to exist on *both sides* as to terms. We ascertained positively that no engagement whatever had been undertaken for any definite term, and we dictated as the only possible solution of the difficulty that any supposed agreement should at once cease and determine. We cannot understand to what engagement our correspondent refers as "implied by the terms of subscription." The only "terms of subscription" with which we are acquainted are those printed on the title page, viz., certain rates, paid in advance; and, as we are informed, the rates specified were not charged, nor had any payment in advance been made.

The paragraph relative to so-called "trade interests" fully confirms our remarks that the Committee accepted the *quid*, but ignored the *quo*. With respect to the supposed increase in the number of our readers, we would just hint that, in order that *readers* may be profitable to the publisher, they have need to be readers who are also purchasers at a profitable rate.

Our correspondent will perhaps be surprised to learn that since the cessation of our very nominal official representation of the South London Photographic Society the number of copies demanded for London distribution, instead of having decreased, has, on the contrary, increased.

We publish the preceding letter because it is an attempt at justification: it certainly justifies our remarks. The existence of misapprehension on both sides *is admitted*. What, then, is more correct than to start afresh? For our part the severance of the quasi-connexion was of so little importance to us, that we should have allowed it to have occurred, as we did, without the slightest public notice; and had personalities and unwarrantable imputations been avoided in the "Annual Report," we should have been spared the expression of our just indignation.—ED.]

NEGATIVES AND DEVELOPER.

To the EDITOR.

SIR,—An answer to the following will much oblige:—

1. A glass negative, on which the image can *scarcely* be *discerned*, is *exceedingly intense* by *transmitted* light, and *prints well*. What kind is it? Over-exposed or over-developed, or the collodion too thick or insensitive by being kept too long out of the bath?

2. *How* do *developers* act? How, and under what circumstance were iron and pyrogallic acid chosen for developing, and why used?

I am, yours, &c., M. D.

[Your note arrived too late for notice in our last.

1. The negative which you describe is exactly what a *good* negative should be, and consequently correctly exposed and properly developed.

2. The action of developers is due to their de-oxidating property; and by the abstraction of oxygen from a metallic salt (nitrate of silver) the compound is decomposed, and the base precipitated more or less in a metallic form. It is found that the action of light upon iodide of silver induces a molecular change of condition (according to some), or sets up an electrical action (according to others)—perhaps both—by which the silver in the act of deposition is attracted to those parts influenced by actinism in direct proportion to the intensity of the influence excited. With most developers a small quantity of a mineral acid, or a larger one of a vegetable acid, is conjoined; because a free acid retards the rapidity of the reduction, and thus sufficient time is allowed to the nascent

metallic particles to be attracted to those parts acted on by the light—hence, if the restraining acid be too weak, *fogging* is the consequence, the particles of metallic matter being formed more rapidly than they can be disposed of.

As regards the choice of a developer, the proto-sulphate of iron is very energetic, and throws down the silver in comparatively large crystalline particles: hence their brilliancy. The organic developers, such as gallic or pyrogallic acid, proceed more deliberately, and give rise to more finely divided particles. But there is also another difference: oxide or sub-oxide of silver forms with organic matter a chemical compound, and probably when a portion only of the oxygen is withdrawn the sub-oxide of the metal unites with a portion of the organic developer, and the precipitate is no longer metallic in lustre, but dull and coloured. This is why nitric acid is preferable with an iron developer and a vegetable acid with an organic one: the character of the reduction is thus retained in the most complete integrity.—Ed.]

VARNISH, &c.

To the Editor.

Sir,—I shall be much obliged to you if you will reply to the following inquiries in the next number of your valuable Journal:—

1. I have a large stock of French negative varnish, bought some three years ago from Gaudin and Co. (no label on bottles). I find that, in printing in the sun, the sensitive albumen paper detaches some of the varnish. Is there any gum that could be added so as to harden it?

2. In stereoscopic photography, using the iron developer (double-lens camera), I frequently have *one* of the pictures fogged in the *shadows*. What is the cause, and the remedy?

3. I have perseveringly been using bromide of ammonium, in addition to the iodides; but, independently of making the bath very alkaline, I cannot get details in foliage (subjects, rural scenes of cottages and trees), and there is a general deficiency of half-tone. Could you help me out of my difficulties?

I use Hardwich's and Thomas's collodions.—I am, yours, &c.,

Penzance, July 25, 1861. DELTA.

[1. We know no remedy that would be safe: better lose the varnish you have than risk injuring a good negative.

2. You do not give sufficient data for us to judge. Is it always the picture on the same side that is fogged? If so, the fault is most probably due to setting of one of the lenses.

3. There is an apparent discrepancy in your account: an alkaline bath would scarcely produce deficiency of half-tone, but more likely fogging. We rather fancy that you very much under-expose your negatives, from your obtaining neither half-tone or foliage.—Ed.]

WHAT IS IT WORTH?

To the Editor.

Sir,—Although the justly-indignant "screech" from Glasgow evidently had a sting for the individual so lamentably concerned, in the last number of that same funny individual's journal he indulged as rabidly as ever in the personal attacks for which he has so often been severely taken to task.

Yourself and Mr. Wall are the more recent objects of attack. Beginning with the latter he takes exception to the statement made in that gentleman's reply to yourself, viz., that he "lays no claim to great scientific attainments," and thence jumps to the conclusion that Mr. Wall must be "ignorant of a few elementary truths in geometry and optics which could be picked up in half-a-dozen lessons." It strikes me that this is about as logical as to argue that any one not claiming great literary attainments thereby proves himself ignorant of the alphabet.

This "Jersey oracle" is, however, very gratuitously indignant to learn that "sharpness, hardness, depth of focus, true perspective, and so forth," are not understood yet, exclaiming—"What a set of dunces photographers must be!" Before doing so he should have remembered the bewildered state of his own "y z." How long is it since, having a new "bee in his bonnet," he cracked up waxed-paper, and to serve its cause denounced "sharp" pictures as "hard mechanical horrors," and "earnestly impressed" upon his readers "the utter worthlessness of mere sharpness and delicacy." This was in April, 1861. Yet in the last number of the same periodical he tells us "a photograph cannot be too sharp, and it should be sharp everywhere." It is not worth while to multiply these absurd contradictions, although almost every article written by this eccentric individual contradicts more or less its predecessors.

Now, as he says, *this* process surpasses all others, and anon it is the worst of bad processes. Now *this* invention is to "work an entire revolution in the art," and now it has turned out utterly worthless. Now *this* man is the greatest photographer of the day, and now he is the worst. Now photography is undoubtedly a fine art, and now, as in his last, it is purely mechanical, &c., &c. In short, sir, of such an one's opinion, permit me to ask—What is it worth?—I am, yours, &c,

ONE WHO DON'T LIKE WEATHERCOCKS, AND RESENTS COARSE PERSONALITIES.

PASSE-PARTOUTS.

To the Editor.

Sir,—Although editors are supposed to know everything and everybody's business (everything photographic), and bring it before the public, there is yet one thing that has not appeared in the pages of your interesting Journal, and which I think would be very well received if you or some friend would furnish the information. I refer to the manufacture of passe-partouts, which owes its birth, I believe, entirely to photography; and, I must own my weakness, that excepting a good photograph itself there is nothing in the whole range of our art that I have admired more than the workmanship displayed on a passe-partout. I may be laughed at for this weakness by some bearded and moustached fop of a photographer; but let him be placed where I have been, far from a town, and a customer brings back a portrait which he has taken the day before in a white and gold oval passe, which has got broken, and wishes to have another just like it to send away, and he has not got one the same size and colour. He *must* oblige this patron, and no time is to be lost. He can get a bit of glass from the village glazier; he can get a halfpennyworth of whiting at the little shop; he has a pencil, a bit of shell gold, and perhaps a leaf or two of gold; and he may fancy that he can easily and very soon imitate that little passe-partout that he could look upon so haughtily when trying to get them a bit cheaper than the last time he bought a dozen; but he may try until he perspires again, and the small, even simple-looking, gold oval line will set all his puff and foppery at defiance. Not one in a hundred such as he can do it if he could get five pounds for it, simple as it looks. Now look at another pattern—embossed gold. Although upon a flat surface it looks raised up a sixteenth of an inch, relieved by a flat surface most highly burnished. From their cheapness one might think passe-partouts were made by machinery, which makes one almost fear that the skilled workman cannot be remunerated, and that the song of the beautiful passe-partout will have to be sung to the same tune as that of the shirt. Now I think a ramble through a passe-partout manufactory would be a delightful change to the dry bits we have had upon lenses, notwithstanding that Grubb has made the subject as clear as Mudd. These lucubrations are very clever in their way, no doubt, but my optics are too obtuse to dive into such beauties.

As editors are likewise expected to be good-natured, I hope I shall be pardoned for giving this hint; and if cheerfully accepted, perhaps I may give you another pleasant walk some other fine morning.

I am, yours, &c., OLD SLYBOOTS.

[We believe that by far the greater number of passe-partouts are made in France by women and children, and that their very moderate price is due principally to a judicious division of labour, very many hands being employed over each one. The beading is made of papier-maché by aid of a mould; and it is probable that machinery may be employed in drawing the oval or other lines, but we do not know that such is the case. A few passe-partouts are made in London, but they differ much in appearance from the French ones. Perhaps our Paris correspondent may enlighten us as to the particulars of manufacture.—Ed.]

PHEESIC FOR PHOTOGRAPHIC NOTES.

DOSE THE SECOND.

To the Yedditur.

Sir,—I ca' it *pheesic*, as it's intended to cure the bile, and hinner puir donnart bodies frae casting dirt in the faces o' their betters.

But first o' a', what for did ye alloo your wee ill-faured printer's deevil tae print at the tap o' my letter "Screech," instead o' "*Screed* frae Glasgow?" Just cuff the callan's lugs for me, Mr. Yedditur, and cuff them soondly, an' Ise do ye a favour again: it'll learn him mainers in future.

O deerie me, hoo the last dose *did* work Tam o' Jersey! It just acted for a' the warld like barm in a bottle o' ginger beer—oot flees the cork, an' ower wi' a fizz comes the froth an' the gas an' the wishy-washy contents.

Puir fallow! sae he didna like my last letter! weel it stan's tae raison that he shudna'. Oor Towser (that's the dog that watches the back yard a' nicht) disna' half like when I see it tae be necessary tae lay the horsewhip ower his back; an', as I said before, it stan's tae raison oor freen Tam winna like it either. But it's a' for his ain gude, tho' he disna think it. Man, I got his last *Notes!* an' whan I confess tae that muckle, ye can weel understan' that my wame has been sair for twa hail days wi' lauchin' at it. Weel, he has fairly entered the lists wi' me noo, as you Englishers wad say; an', seein' that he has come tae handigrips wi' me, wae betide me gif I be the first tae let go: I'll gie him cuff for cuff as lang as he likes.

Weel, as ye dootless ken, he translated bits o' my letter intil English, tryin' to get a lauch raised at my expense. Just you bide a wee, Mr. Yedditur, and if I dinna mak him lauch wi' the wrang side o' his mooth before I'm dune wi' him, my name's no' Donald M'Alister, son o' decent Alister M'Alister. The bodie had that muckle sense left as tae ken that, had he gien the letter as it stood, it wad only hae made a fule o' himsel': he's a rank cooard, or he wad hae pit it a' in. My certie! just write a letter praisin' him, an' in it gangs; an' the writer is a fine fallow, an' gets a pat on the back.

Frae his last *Notes* it wad seem that oor freen Tam seems tae be gettin' sick o' photography (weel, I daursay the feelin' will be mutual, could oor puir art fin' words tae express itsel'), an' takin' up the makin' o' steem engins. He has invented ane that's gaun tae turn the warld upside doon. Just hear him:—"the invention is *unlike anything* that has ever been applied to the purpose,". &c.; but, notwithstanding the *entire novelty* o' his invention, wad ye believe that the bodie, no' thirty lines farrer doon, writes aboot the same glorious invention: "there are no less than fifty-seven patents for *inventions similar to our own;*" an' he hopes his readers winna tak' it amiss "if we sometimes exhibit a boat at a meeting of the Photographic Society, or tell you about a new *propeller* instead of a new *dry process.*"

Noo, Mr. Yedditur, div ye want ony mair proof than that that the man is gyte? I see he is noo misca'in' you the sam' way he used to do dacent Mr. Malone—I mean him that the gorilla spat upon the ither day. But I'm no sae shure after a' but what I wad muckle raither be fyled wi' that bodie's spittings than be plaistered ower wi' Tam's *butter.* I'm kind o' wae for Tammas Ross that t'other Tam is dabbin' him sae thick ower wi' the butter, dootless tae mak' ammends for the descredit he pat on the dacent man, Andrew Ross's son, by makin' sic a use o' his business letters as he did. The butter's ower thick tae last lang; for just see hoo he used tae beslaver Burnett, o' Edinburgh, in the sam' way, till it cam tae a head, and then Burnett was heaved owerboard, and muckle misca'd.

But man! what div ye think? I've foond oot the raison why he *honoured* (for I'm no' shure, after a', if it's no' a kind o' honour) Mr. Malone wi' his bile; an' it'll also be a cloo tae his bile against yersel', Mr. Yedditur. It's this. Tam was actilly tryin' tae get himsel' made Yedditur o' ye're Journal (lang before you had oucht tae do wi' it); but the publisher ye ken actilly wad hae naethin' tae do wi' sic a bodie, an' pit Malone at the helm instead! Man, if ye hae ony o' the auld numbers o' your Journal, just you turn up tae the number for the 15th o' February, '59, and ye can read a hail accoont o't. I raily thocht I wad hae deed wi' lauchter when I red it. Odds man, but the wrichter is a perfect Sampson at the horsewhip. He beats baith you an' me. So that you see Tam's spleen at baith you an' Malone is on the principle o' the soor grapes; and that'll maybe accoont for the way he's noo strokin' the London Society *wi' the grain,* instead o' *misca'in'* it, as he used tae do. Maybe he wants a similar job frae it, noo that there's sic strong symptoms o' decline in his ain bit pereeodical. Dr. Diamond's a quiet sort o' man; an' if he does little gude, he does little ill. Ane thing is a fact—he disna fa' intil the blunder oor freen Tam's aye makin', an' that is a trick o' writin' a heap aboot things he kens gey and little aboot, an' then contradictin' his ain sel' in a short time afterwards. A callan's a clever chiel when he can pruve a thing tae be ane way by geometry, an' quite anither thing by mathematics. An' ye'll maybe no beleeve ony leevin' bodie can do that; but just bide a wee, an' I'll gie ye a quotation or twa, an' then ye'll change your mind. In *Photographic Notes,* No. 56, page 173, ye read:—"There cannot now remain a doubt as to the merits of the orthoscopic lens: the only individual who has ventured to raise an objection to it is Mr. Shadbolt. The superiority of this lens consists in its FREEDOM FROM DISTORTION." Tam then goes on an' *proves* this in his ain accurate an' exact way, an' he then modestly tells Mr. Shadbolt that he'll shurely noo admit his mistak'. Weel, wad ye beleeve it, aboot twal months after that he sets tae wark an' *invents* a lens, something similar tae ane that was published in the Mechanics' Magazine aboot a dizzen years ago; an' *why,* think ye? Just because the orthoscopic lens which he had formerly pruved by mathematics tae be *free* frae distortion, he noo pruved by geometry to hae a gude deal o' distortion. Just hear what he says on September 17th, 1859:—"If the orthoscopic lens is used to take a picture, *the marginal lines which should be* STRAIGHT *will be found to be curved. No lens at present in existence will give an image free from distortion.*"

Truly war it said:—"He is an universal genius—great in *dodges* and great in lenses." He *is* great. What better authority in optics could you wish than ane wha could write in that way? He discovered that a simple uncorrected glass meniscus lens works as sharp at the visual as at the chemical focus; an' I beleeve I could fill twa or three pages wi' a bare record o' his inventions. But amang a' his inventions an' dodges an' discoveries, just try an' mention *ane* that is used by photographers at the present day. Weel, I wat, na! His prophesies an' predictions!—Och for them!!—they're name is legion. But I'll tak' them up by themsels some ither time; an', as oor minister says when his sermon's neerly dune, "Weel noo conclude wi' some gude practical advice." An' first I wad say tae the London Society, gif Tam *does* keep his promise o' wastin' the time at the meetin's o' ye'er Society wi' his promised exhibitions o' boats an' ships an' models o' steam engins, just you turn him tae the door, or hand him ower tae the police. An' tae himsel' I wad say: Tam, my man, gif ye really intend tae turn your *Notes* intil a nautical journal, do sae by a' mainner o' means; but, gudesake man, keep a mair ceevil tongue in ye're head than ye've hitherto dune, or it will be the waur for yersel'; for ye see ye'll be gettin' a sea-farin' class o' readers then, an' as they're a rough set, they winna put up wi' sae muckle slack jaw as some ither folks micht. I'm really wae for ye, puir man; but accordin' tae ane o' ye're ain predictions, I doot your fast gaun—there's a' the symptoms o' it noo; for ye'll recollect attributin' the death o' the *Photographic Record* tae its habit o' copyin' sae muckle fra ither journals. I daur say when ye wrote that ye never thoucht that it wad hae come tae this, that *the* only READABLE articles in the *Notes* of July 15th are nine in number, an' the hail nine are *copied* oot o' ither journals an' newspapers. But if your *Notes* shud dee suner than you expect, just apply tae some o' oor Glasgow publishers, an' ye'll dootless get a job at translatin' Scotch intil English; for your talent that way is vera wonderfu', judgin' by the job ye made o' my last letter.

I am, yours, &c., AULD LENS.

Glasgow, July 19th, 1861.

ANSWERS TO CORRESPONDENTS.

☞ **The Publisher will be glad to receive from Agents and others spare copies of the following numbers of this Journal, which are out of print, viz.:—March 1st, 1860; and January 15th, April 1st and 15th, and June 1st and 15th, 1861. Full price will be allowed for these copies.**

S. C.—A tin box, by all means.

RECEIVED.—"Handbuch der Photographie."

T. R.—We shall have an article on the subject to which you allude very shortly.

C. S. P.—We fancy that Mr. Cramb's camera would suit you exactly: see description of it in the present number.

FERRUM.—Not *alone* for negatives, but as a preliminary developer. See reply to "M. D.," in this number.

VERDANT GREEN.—Your letter was received too late for our present number: it will be attended to in our next.

GORILLA THE SECOND.—Your "squib" is more of a rocket—aye! a Congreve rocket—it is so dangerous. We thank you; *but* it is too personal to be published.

JACOPO.—We fear that you will not find the exemption from search at the various "Customs" stations apply to your prepared plates, whatever you may have been informed to the contrary.

C. L. B.—We can safely recommend the little *Manual* lately published by Mr. C. Jabez Hughes; and when you have mastered that, Mr. Hardwich's *Manual* should find a place on your bookshelf.

W. R. SMITH.—We have expressed our views; and, therefore, if our other correspondent is misled by "A. K. S." it is his own fault. Free trade. We are quite willing that all should have their say.

NO CHEMIST.—The smaller proportion of acid would no doubt render the plates more sensitive; but it would also probably interfere with the length of time that they would "keep" without deterioration.

HARD LINES.—You have used too large a proportion of citric acid: reduce the quantity by half, or, what is the same thing, make an equal quantity of pyrogallic solution without any citric acid, and mix the two together.

JAMES A. (Leicester).—You will find an old collodion that has been iodised for some time, answer your present purpose best. If a little thick, and giving a creamy film, so much the better; but it will be rather slow in being impressed.

NOVICE.—It is evident that your glasses are improperly cleaned: the curved streaks are probably caused by grease on your cloths, which have most likely been washed with soap. Have them washed with soda and water only, and then well rinsed.

FRAS. OLDFIELD.—We cannot advise you to procure such a lens as you name without your first seeing the various pieces of apparatus necessarily connected with its use. You are not far from London, and you had better run up and call on Mr. Ross, and he will show you all the "belongings" as well as the lens; then, if you are inclined to undertake the trouble and expense entailed, you can go to work at once. Undoubtedly, for many subjects (especially for rural landscapes), the result is good if the manipulation be equal to it.

P. S.—We have repeatedly stated that is not so much the *process* as the operator by which instantaneous pictures are obtained. No formula that we could give would be of any use to you without your possessing the requisite skill to apply it. See the *British Journal Almanac* for an "instantaneous" wet formula; for a dry one, apply the same principles—that is, make your chemicals accurately balance. Use a quick-acting lens, and be *very* patient in developing. There is no royal road to success—nay, more, there is no certain road at all times.

J. ARNOLD.—We have seen several very excellent illustrations of Matlock and other Derbyshire localities. Mr. Ogle, of Preston, has taken those about Buxton, Haddon, Chatsworth, and Castleton. Mr. Hill took several at Matlock, Haddon, and Wingfield Manor. Mr. Petschler has also taken some larger views at Haddon and Chatsworth. Mr. Woodward has illustrated Dove Dale; but, for all that, you may well visit the locality profitably, for the mine is almost inexhaustible. Should you go to Matlock, you will find the Temple Hotel afford you very comfortable accommodation, and there are several fine views to be had just outside the door.

☞ *All* EDITORIAL *Communications,* BOOKS FOR REVIEW, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 148, Vol. VIII.—AUGUST 15, 1861.

Re-discoveries.—M. M^c^-A. Gaudin, in a recent number of *La Lumiere*, remarks upon the persistent sensitiveness of the wet washed collodion film, as if there had existed any previous doubt upon the subject. He is clearly unaware that Mr. Russell Sedgfield has long been in the habit of utilising this phenomenon for the purpose of allowing, without detriment, a prolonged exposure of the collodion in delineating interiors. In some of his observations regarding this subject we think he falls into an error happily nearly obsolete amongst English operators having any pretensions to scientific knowledge: we mean the exploded notion that the addition of certain foreign substances is likely to increase the sensitiveness. The best authorities are now of opinion that the simpler the composition of the collodion the greater the probability of obtaining all the ingredients in a state of purity and neutrality, the exaltation of sensibility appearing to depend chiefly upon the delicacy of equilibrium of the chemical condition. We fancy that M. Gaudin is a little behind-hand in his photographic reading: it was but the other day we found him introducing glycerine as a novelty (!) in photography, entirely oblivious of the fact that it has long ago been tried in this country in precisely the same way as lately recommended, and found wanting; and now we have him gravely asserting that he has essayed the effects of tannin, and observes that it adds much to the intensity of the picture. Has he read nought of Major Russell's experiments?

Harrison's New Lens.—In the communication from our New York correspondent, Mr. Seely, which appeared in our last, allusion is made to a proof enclosed therewith, printed from a negative taken by means of Harrison's new lens, an imperfect description of which was given in a previous number of this Journal. It was stated to consist of two achromatised meniscus lenses, having their convex surfaces segments of the same sphere, and arranged opposite one another so as to be located in the periphery of a common centre. At first it was asserted that the new lens would embrace an angular field of 180° when working upon a plane surface, but subsequently this statement was corrected, it having been erroneously quoted instead of 90°.

The specimen before us is the second with which we have been favoured by Mr. Seely, the first having for its subject the interior of a photographer's studio, with the operator (we presume) seated under a species of canopy, busts, printing frames, &c., being arranged in a somewhat semicircular order, doubtless for the purpose of allowing them to be tolerably well defined upon a flat plate. The specimen more recently received is a landscape, and occupies the entire circular surface that the lens will cover, there being a black, indistinctly defined margin all round the picture. The centre of the view consists of a house standing in a garden, with a saw-mill and tall chimney-shaft, sheds, &c.; in the foreground is a timber yard with piles of deals, &c.; in the middle distance is a river, and beyond that on the opposite shore, several houses; and, finally, there is the distant horizon. Several trees and shrubs, including a fine larch in the centre, are scattered here and there all over the subject. From the preceding it will be readily concluded that there is no lack of definition; but it must be equally evident that a very small aperture must have been employed when taking the picture, or it would have been impossible to have included so long a range of subject with sufficiently fair definition. But here we must stop in our commendation; for, as regards angle of subject included, it is very evident to any one at all accustomed to observing such matters that it does not approach to 90° across the entire diameter of the circle. To us it appears to embrace about 60° from extremity to extremity at most; and if the picture were cut to the form of a parallelogram, as usual, it might include from 40° to 45°—that is, just about the same amount that our good landscape lenses will generally cover. We are consequently constrained to ask — where is the gain? We have no doubt of our informant's good faith in making the statement that he did, and we believe him to have been simply the victim of an error in calculation. We are in hopes that our correspondent will favour us with a statement of the distance of the plate from the lens, and the extreme distance between the two outer surfaces of the back and front portions of the combination: we shall then be in a better position to judge of the angle of picture embraced, and should we find our impression to have been erroneous, we will most willingly correct our report.

We purpose bringing the specimens when we next attend a meeting of any photographic society, and exhibiting them to our brother members. We believe the first that will take place will be that of the North London on the 18th September next.

An Odd Mistake. — On the very day that we "went to press" with our last issue we were perusing the official organ of the French Photographic Society, and were not a little amused at the very droll blunder committed by the members of that body, as detailed in the report of their July ordinary meeting, at which the subject of the approaching Industrial Exhibition—so far as it applied to photography—was discussed, with reference to the letter from Dr. Diamond and other documents which accompanied it. The official answer to Dr. Diamond's letter we gave in our last, and we were in hopes that the *assurance* therein mentioned as having been given by the Royal Commissioners of an intention to take into consideration the remonstrances made relative to the mis-classification of photographs was founded upon some direct communication to the French Commissioners; but our readers may imagine our surprise when they learn that the hallucination arose simply from a misapprehension of the position erroneously assigned by the members of the French Photographic Society to Dr. Lyon Playfair, who appears to have been regarded as invested with *authority* in the matter; whereas the fact is that he is as powerless as the Council of the Photographic Society, and with them issues an indignant protest against the unphilosophical character of the mis-classification of photography as at present existing. What Dr. Playfair expressed as a hope, namely, that

the Royal Commissioners would surely listen to reason on this subject, our French brethren have, imagining him to be associated with the Royal Commissioners in some official capacity, interpreted into *an undertaking on their part* that the matter shall at least be re-considered, and, if possible, adjusted satisfactorily.

Of course with the conclusions at which our French friends have arrived we have nothing to do, but it does seem to us a pity that they should have been settled upon false premises. It has been insinuated, or perhaps we should rather say broadly asserted, in the pages of a contemporary, that our neighbours imagine us to be actuated by a desire to keep their productions out of the Exhibition lest we should be worsted in the comparison. We verily believe that no such general impression exists amongst French photographers, and that it is confined entirely to the mind of the writer of the article in which the assertion is made. Englishmen are not afraid of being beaten, and Frenchmen know that well enough; and they know further that, if the former should be beaten in that friendly rivalry, it will only instigate them to greater exertion in order that they may make a better figure on the next occasion for comparison. Knowing this, the imputation of fear is one which our French friends have too much good sense to cast upon us.

We presume that our worthy friend, Dr. Diamond, will be authorised by the Council of the Society to explain the mistake made by the French Society regarding Dr. Playfair's letter.

HINTS ON CAMERAS.

You tell me that many of your readers wish to make their own cameras, and therefore would be interested in knowing how I constructed mine; but, as there are some things that I should alter in a *second edition*, I think I shall best consult their advantage by merely throwing together a few hints on the subject (the results of experience), which may remove some of the difficulties that an amateur would encounter were he to attempt to make one of the ordinary form.

The material that I originally employed was mill-board, such as bookbinders use for the covers of octavo volumes, but I do not recommend it.

In the first place, it is difficult to cut, as the gritty matter contained in it rapidly spoils the edge of the tool; and, in the second place, it is very liable to warp. But, should any one wish to try it, he will find it best to use a board for the base, and to make the top and sides in one piece, forming the angles by cutting it half through, bending it in the cut, and fixing it to the base-board with glue and nails or screws—at the same time rubbing thick glue into the bends to strengthen them.

The best material, however, and one which I should use exclusively were I to make another camera, is what you have recommended more than once—the straight-grained Honduras mahogany, known at the timber merchant's as "coach panelling." It is not liable to warp, is light, and is easily worked—the last being an important quality to an amateur.

The groove in which the dark slide is inserted is likely to prove a difficulty to anyone who is not expert in the use of carpenter's tools: it will therefore be a relief to such an one if I assure him that it is unnecessary. Some years ago I happened to see at Mr. Ross's portions of an enormous camera, intended for taking pictures three feet by two feet; and, on inquiring how the heavy dark slide was to be handled, I was informed that it was not intended to be dropped into a groove, but to be attached to the back. In adopting this plan (of which I clearly perceived the advantage for small as well as for large instruments) I had merely to let the top and bottom of the box project beyond the sides the thickness of the dark slide, to fix a thin ledge to the bottom and a button to the top, and the thing was done—the ledge being a piece of stout tin-plate fixed by screws. The shutter is then drawn out to the side, and requires no joint; and a plate-holder may be used with the smallest camera, long enough to shift a stereoscopic plate in working with one lens, after Mr. L. Clarke's or Mr. Hislop's method.

The dark slide of the ordinary camera is generally a neat piece of joiner's work, requiring a good workman to make it; but the one which I use is much more easily made, and, though not so neat in appearance, answers the purpose equally well. I should premise that my camera is a small one, having a landscape lens capable of taking pictures six inches by five, and a portrait lens for plates five inches by four. It is the plate-holder for the latter that I am about to describe.

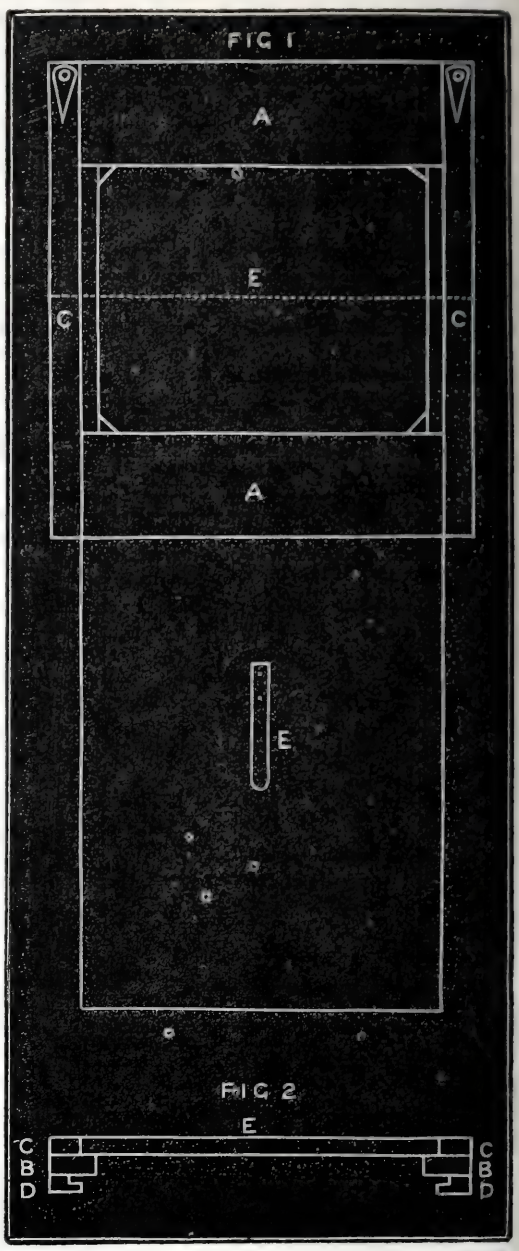


Fig. 1 represents it open ready to receive the plate, and *Fig.* 2 a section across the middle in the direction of the dotted line E. The scale is one-third of the real size.

It is formed of three layers of straight-grained mahogany, a full quarter of an inch thick. The central layer (which might be three-eighths thick with advantage) consists of two pieces (A A) fitting against the ends of two other pieces (B B), seen in section in *fig.* 2, and fixed by two narrow slips in front (C C), and two at back (D D), which are fastened to the centre layer by screws. Before the slips D D are screwed on they are rebated at the back, as seen in *fig.* 2, to form grooves for the shutter, and are so much shorter than C C as to fit inside the end of the camera. The shutter may be made of stout tin-plate or sheet zinc; and the outer end should be turned up and the inner down to form a stop against the side of the camera when it is drawn out. The cover E (of mahogany) when shut down between the slips C C is secured by two small brass buttons, seen at the corners of *fig.* 1. It is hinged to A by a piece of black cloth, which is continued round to the back of A, to meet the end of the shutter and exclude any stray rays of light.

The silver wires should be so placed as to support the corners of the plate as far as possible from the shutter, which latter should be well varnished with a strong solution of shellac in alcohol or wood naphtha, applied before a fire. The same solution made very thick (which may be purchased by the name of "liquid glue" or "hatter's varnish") is useful for filling the joints of the wood-work, and for putting together the small frames which drop into the dark slides for the purpose of carrying small plates.

The frame for the focussing-glass may be made on the same principle, with two layers only, as it wants no cover; but the thickness of the wood must be so adjusted as to place the ground surface of the glass at the same distance from the lens as the sensitive film.

A black for the inside of the camera may be made thus:—Mix lamp-black or vegetable-black with spirits of wine, to form a thick liquid, and add to it a small portion of the solution of shellac. This should be laid on with a flat camel's-hair brush before a fire. If it dries *shiny*, too much shellac has been used; if it rubs off, too little. Either of these faults can be rectified in the second coat.

For the purpose of excluding light, and for forming hinges and fittings, black cloth (cut from an old coat) is a very useful material. It may be fixed with glue, or with the thick solution of shellac.

J.

[The preceding description of a home-made camera is from the pen of an intimate friend of the editor's, now deceased.]

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

ALCOHOL.

Synonymes.—Spirits of wine, hydrated oxide of ethyle, spiritus vini rectificatus, S.V.R.

Composition.—$C_4 H_6 O_2$ or $C_4 H_5 O + HO$.

Equivalent.—46.

Preparation.—This important compound is a product of the metamorphosis of sugar under the influence of a ferment, and can only be advantageously manufactured on a large scale. Our remarks under this head may therefore be more usefully confined to a description of the methods adopted for purifying and concentrating ordinary commercial spirits of wine. For the guidance of the amateur, however, who may desire to make a little alcohol by way of experiment, it may be stated that if one pound of sugar be dissolved in two pints of water, and some good active yeast be added, and the whole maintained at a temperature of 70° or 80° Fah., until the effervescence of carbonic acid gas ceases, it will be found to have suffered transformation into alcohol — of course largely diluted with water. This, however, may be separated by introducing the whole of the liquid into a retort, and distilling off about half-a-pint of the contents. To this should now be added about four ounces of dried carbonate of potash, and the mixture frequently shaken. On allowing it to remain at rest for a short time, it will be found to separate into two strata of different degrees of specific gravity. The upper or lighter portion contains the alcohol: it may be separated from the lower portion by means of a pipette or syphon, and finally rectified by re-distillation from a smaller retort containing a little quicklime.

Pure or (as it is sometimes termed) absolute alcohol is obtained by distilling spirits of wine from certain bodies which have a high affinity for water. These have the effect of dehydrating it, or depriving it of its water. Such substances as carbonate of potash, chloride of calcium, anhydrous sulphate of soda, and anhydrous sulphate of copper may be employed; but there is nothing equal in efficiency of action to pure and newly-made quicklime. When this latter substance is used, it should be introduced into a retort in a powdered state, and the spirits of wine (from which a portion of the water has been abstracted by means of carbonate of potash as above described) added to it. The mixture should be allowed to digest during forty-eight hours, and then slowly distilled by the heat of a water bath. The weight of lime should be about the same as that of the alcohol to be rectified.

Properties.—Pure anhydrous absolute alcohol is a colourless limpid liquid, of an agreeable odour and pungent taste. Its specific gravity at 60° is ·794; it boils at 173° Fah. The specific gravity of the alcohol of the pharmacopœia, however, is 0·820, and its boiling point 176° Fah. The article usually sold as absolute alcohol is about this specific gravity. Its affinity for water is so strong that it will absorb it from the atmosphere: it requires, therefore, to be kept in well-stoppered bottles, as, after exposure, it undergoes a sensible increase in specific gravity. Alcohol is very inflammable, burning with a pale bluish flame free from smoke. It has never been frozen. It is miscible in all proportions with water; and in the act of dilution a contraction of volume takes place, and the temperature rises. This remark applies to ordinary spirits of wine as well as to pure alcohol. It is a most useful substance in chemical investigations and in many of the arts, on account of its extensive solvent powers, being capable of causing the solution of many organic and inorganic bodies, as, for instance, the vegeto-alkalies, resins and essential oils, and saline compounds, as the iodides and bromides of potassium, cadmium, and ammonium.

Uses.—Alcohol is employed by the photographer, in conjunction with ether, as a solvent for pyroxyline in the preparation known as alcoholic collodion, and also in ordinary ethereal collodion, as aiding the solvent power of the ether upon the pyroxyline, and as the most suitable menstruum for the various substances used to iodise collodion. It is introduced into developing solutions for the purpose of making them flow with greater facility over the plate in the wet collodion process.

Impurities and Tests.—The liquid known in commerce under the name of spirits of wine contains variable proportions of water, which would of course be indicated by its specific gravity. An article possessing a gravity of ·815 to ·823 would contain from ninety to ninety-three per cent. of real spirit, while the most common spirit, having a gravity of ·840, contains from eighty to eighty-three per cent. Water can hardly be classed among the *impurities* of alcohol in the strictest acceptation of the term; but as no specimen containing it can be regarded as *absolute* alcohol, an easy and to some extent effectual method of separating the water becomes a desideratum. Some years ago a German chemist introduced a process for the ripening and mellowing of wines, which consisted in putting them into a clean bladder, or into a vessel tied over with bladder; and if this process be applied to ordinary spirit containing water, it is found that, by a peculiar process of exosmosis, the aqueous vapour penetrates the membrane in preference to the alcoholic vapour, and, by evaporation from the outer surface, materially increases the strength of the contents of the bladder. The preference given to smuggled spirits, which are frequently concealed in bladders about the persons of the smugglers, arises from the increase in strength which they are known to acquire from being kept in these membraneous vessels. The smugglers are equally aware that there is a corresponding diminution in the bulk of the spirit through the evaporation of the water, and doubtless charge accordingly. It has been found that spirits of wine having a specific gravity of 0·867 may with great facility be reduced by the above means to 0·817. When it is desired to increase the strength of commercial spirits of wine, by converting it into what is generally known as absolute alcohol, the method with carbonate of potash and quicklime described above under the head of "*Preparation*" may by preference be followed, as being more suited to operations on a large scale, and as including within its scope a more definite series of operations than the mere introduction of spirit into a bladder.

Fusel oil and naphtha may be reckoned among the impurities occasionally present. The first would be indicated by dilution with water, which would produce a milkiness if fusel oil were present; while evidence of naphtha would be obtained if an unpleasant smell were left after rubbing a little on the hands. Fusel oil is separated from alcohol in the process of manufacture by agitating with carbonate of potash and re-distillation. Alcohol boils at 176°, and fusel oil at 268°; and at first sight it would seem that this difference in their boiling points would render their separation comparatively easy. It is found, however, in practice, that the vapour has a tendency to rise in company with the vapour of alcohol at a temperature much below 268°, and that the carbonate of potash is introduced with great advantage, seeming to possess the power of holding back the fusel oil, and allowing the alcohol to pass over free from that impurity.

The separation of naphtha, or wood spirit, when once added to alcohol, presents insurmountable difficulties; indeed, it has been decided on by the government as the most suitable substance to add to that spirit which is imported free from duty and used in the manufacture of varnishes, &c., on account of the impossibility of removing the odour and other properties of naphtha: any alcohol therefore containing it may be regarded as unsuitable for photographic purposes, and should be at once rejected.

Effects of Internal Use.—These are, unfortunately, almost too well known to need description. As, however, statements under this head, where practicable, are included in our plan, it is necessary that it should be said that, from its action on the system, alcohol may be termed *poisonous*, though, when more or less dilute, it is said to be *intoxicating*. When extremely large quantities are swallowed, it produces complete insensibility; the breath smells strongly of spirit, the breathing becomes loud and difficult, the face swollen, and of a bluish red colour, with apoplexy, or paralysis of one side. If the pupils of the eyes become dilated and fixed, recovery rarely takes place.

Antidote.—Promotion of vomiting, cold cloths and air to the head, warm bottles to the feet, with friction of the legs. Bleeding may be resorted to with advantage, but under surgical direction.

"DOMESDAY BOOK" AND THE "LIBER STUDIORUM."

It is a very long time ago since the first Napoleon stigmatised us as "a nation of shopkeepers." It is not so long since John Bull collectively set up a place of business of his own, and opened shop at the South Kensington Museum, though if he had left off buying pictures as well as taken to selling them, the circumstance would have had some compensatory features. The officials "took stock" the other day at the aforesaid shop, and found the amount of sales, and business generally, looking satisfactory—as it ought to look when the rent and taxes and the assistants are not paid out of the profits of the firm, but out of the public purse. Since they commenced business in October, 1859, up to December, 1860, the number of photographs sold has been 15,584. The productive powers of this establishment—though all its members work very hard, and display all that untiring energy which Government

employés invariably do, at all times and seasons, and upon all occasions—are not at all adequate to the demands made upon them by the public. Thus clerks have to stand pen in ear and order-book in hand, instead of doing a ready money trade. So "give your orders! give your orders! ladies and gentlemen!!"

The Government establishment has lately added another branch to its business, and is now selling books as well as pictures. It thinks there is no reason why any document should in future be exposed to such casualties as ruined the Cottonian Collection, and so it has begun by giving us, not duplicates only of such things, but *whole editions*. Now such multiplications of any ancient book, however interesting, is simply absurd. Such speculations would ruin any private firm in twelve months. Who will buy them? As it has been well put by a contemporary, "the reproduction by photography of the Cornwall *Domesday Book* is merely a *curiosity*, and nothing more." No scholar will care to use it in place of the printed edition, for no one is likely to feel that he will gain in increased accuracy what he loses in time and eyesight. The cheap price and portable form may perhaps tempt a wandering archæologist to take it with him when he goes to explore the district; but here, we believe, is the whole use of the edition, and, consequently, where the whole demand for it will end. For several reasons there is scarcely a county in England which offers so little interest to the student of *Domesday* as Cornwall. From its remoteness that county was little known in the eleventh century; from its poverty it was little important; and from the extraction of its population it can scarcely be said to belong to Saxon England. But for its mines it would probably have remained unsubdued, except in name, until a late epoch. As it is we only infer dimly that it was reduced under Athelstane. It is also remarkable in its singular absence of historical names, to explain which we quote Carew's quaint reasons:—"For noblemen, I may deliver in a word that Cornwall, at this present, 1602, enjoyeth the residence of none at all, the occasion whereof groweth partly because their issue female hath carried away the inhabitance, together with the inheritance, to gentlemen of the Eastern parts; and partly for that their issue male little affecting so *remote a corner* liked better to transplant their possessions to the heart of the realm." The duellist, Lord Mohun; Sir John Trelawney, famous as the Protestant Bishop of Bristol, whom James II. imprisoned and the Cornish men rose to defend; and Amy Robsart, whom M. Froude has lately invested with a fresh interest—are the chief names that rise to memory.

What is really wanted is a publication of the separate texts in ordinary Latin, without the contractions which the scribes employed. The Mechanics' Institutes of our country towns might fairly be expected to buy the *Domesday* of their county and, perhaps, of their adjoining counties, and the study of local antiquities would thus be promoted. Of course, public libraries and private purchasers would take copies in this shape even more readily than the less legible photographs.

Photography should be reserved for MSS. such as *Gascoine's Lexicon Theologicum*, which no scholar is at present likely to edit, or the scarce editions of the old schoolmen, such as Wycliffe or Roger Bacon—works which every public library should possess, but which will never repay editing and printing; and even in such applications there is scarcely a call for *whole editions*—a limited number of duplicates would, doubtless, be found sufficient.

The *Domesday Book* is also not "a success," *photographically* speaking. The photographs are said to have been taken in a bad light, in the depth of winter. Whether or not, the lines have a blurred appearance which does not belong to the original manuscript. The fault may, or may not, be laid to the manipulation. Ordinary readers will probably, in consequence, have to call in the aid of a magnifying-glass to decipher the proper names where they are crossed through. The red cross stroke through proper names, which was intended in the original to direct the reader's eye, cannot, of course, be reproduced by photography in any distinctive way, and is therefore a serious disadvantage in the transcript. The evil has been diminished by causing the original red colour to be put in by hand-labour; but will this sort of thing *pay?* The book, altogether, was certainly a bad one to choose.

The reproduction of Turner's *Liber Studiorum* evinces better judgment. But why should they be done by governmental departments at all? A government is supposed to be a paternal, fostering kind of institution, which should help inventions, discoveries, and arts through their infantile days, and, when they are able to "go alone," should withdraw that aid for the tending of some other bantling. With regard to photography exactly the reverse has been the case. Photography owes nothing to government aid during its nonage—has been altogether the result of the labours, discoveries, and improvements of a private class of men—and yet, directly it reaches a certain practicable and productive status, it is taken up precisely at the point where all good government should lay it down—is taken up and used against the very class who have helped to make it what it is. Undersold and excluded, it is but natural that they should feel themselves aggrieved at the perpetration of such a piece of injustice. The invitation to *purchase* negatives of the Science and Art Department, now that they have more orders than they can execute, does certainly appear to come with very little better grace than that with which we throw a bone to a dog—or, is it meant to imply that photographers are not able to do them well enough themselves?

S. T.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. VII.

Copying, to do it properly with all sorts of subjects, is one of the most difficult photographic operations, more so than taking original pictures, particularly by persons unacquainted with optics—a fact probably well known to many, to their cost and waste of time, as well as to myself. In copying it is of the highest importance to have the picture to be copied as well lighted as possible, whether it be by reflected or transmitted light, and whether the subject be a positive or negative—an engraving, oil-painting, or water-colour—maps, or other subjects. If it be difficult to make a copy of the same size or less than the original, it is still more so to enlarge satisfactorily; in fact there are no lenses yet made which will do it properly—at least, all the enlarged copies I have yet seen have such indifferently bad definition that they are not worth keeping. Another very obnoxious quality in enlarged copies is their flatness, and yet another, their hardness—both of which I heartily detest; but it is not improbable that the definition will yet be fine, and the hardness prevented by full and perfect detail.

As there is a numerous class of photographers innocent of any knowledge of optics, and a still greater number who have very crude notions on the science, I will attempt to explain the various conditions to be observed in producing the different results required in copying. As a specimen of the latter class, an amateur (a well-educated man in other respects), once asked me how I managed to copy and enlarge. He had tried, but could not get an image having any resemblance to the original—that is, in focus. He supposed his lens was not constructed for copying. He thought that to enlarge a one-sixth size to a half-plate, the latter must be twice as far behind the lens as the original was in front of it; so he placed the original six inches from the lens, and expected to have an image of double the size at twelve inches behind, whereas he had no image at all. Thus he had no clear idea that the focal length of the lens had anything to do with the matter, or did not know how to arrange his apparatus.

If it be required to take a copy of the same size as the original, the conditions to be observed are—that the original must be at a distance from the lens equal to twice its focal length, whatever that may be; and the focussing-glass or plate must also be at the same distance, or thereabouts, behind the lens, to be in proper focus. If a copy less than the original be wanted, the original must be moved farther from the lens, and the focussing-glass or plate nearer to it, until the right size of copy is obtained; but if an enlarged copy be desired, we must proceed in the contrary way—that is, move the original nearer to the lens, and the focussing-glass farther from it, till the right size is secured in the best focus possible. A camera suitable for the work is, of course, indispensable for copying.

The rule or proportion as regards the size of an original picture and a copy is this (when they are both simultaneously in focus):—as the distance of the original picture from the lens is to that picture, so is the distance of its image (copy) to the image or copy, whatever the principal focal length of the lens may be. The above distances are called the conjugate focal lengths in contradistinction to the principal focal length, which, as formerly stated, is the focal length for parallel rays. With respect to the above conditions, there is scarcely any limitation to the size of an image or copy: the obstacles are practical ones. A portrait might be enlarged not merely to life size but to any size, were it not for certain difficulties—the chief of which are deficiency of light and bad definition. There are also the mechanical difficulties of operating with large apparatus, ponderous plates, baths, cameras, &c.; but these would no doubt be surmounted if the optical troubles could be got over.

It is very probable the following question would be put to me here, viz.:—You have given a rule or proportion with respect to

the size of an original picture and a copy; but what I want simply to know is the actual distance at which I must put my original from the lens, and at what distance I shall have the image, so that a copy will be twice, three times, or four times as large. Well, this question cannot be answered accurately without knowing the focal length of the lens, and also the curvatures of its surfaces, and whether it be a single or a double lens; but, as a rule, the following proportions will be found pretty nearly correct for either a single or double lens—so near that with a little focussing it will be right:—

	Distance of the original from the lens.		Distance of image from the lens.	
To enlarge	1½	times.....	1⅔	times the focal length..... 2½ times the focal length.
Ditto	2	ditto	1⅔	ditto ..... 3 ditto
Ditto	3	ditto	1⅓	ditto ..... 4 ditto
Ditto	4	ditto	1¼	ditto ..... 5 ditto

In copying a small stop *must* be used: it is out of the question employing large ones; for even with a small stop the definition is so indifferent as to be very offensive with any lens yet produced. Hence results the necessity of having the strongest light thrown on to the picture to be copied, if it must be done in any reasonable time and is to be much enlarged. The hardness of a copy results from deficiency of detail, and this again is the result of insufficiently sensitive chemicals, or weakness of the light on the original, or both; therefore two of the indispensable requisites in obtaining a good copy are to work with a powerful light and sensitive chemicals.

If a picture to be copied by reflection is placed in sunshine the sun's rays should fall very obliquely on it, particularly if the surface be bright—such as that of an oil painting, daguerreotype, &c. —so that when reflected none of them will enter the tube of the lens. The flatness of a copy is the combined effect of bad definition and deficiency of detail, the latter being removed by careful manipulation and a little judgment; but the optical evil is the great difficulty to be overcome.

A double lens—for instance, a portrait combination—I consider to be very much superior to a single lens for copying purposes: it will give a good deal sharper definition than a single one. Every picture to be copied ought to be as sharp as it is possible to be taken; for, supposing the lens were as perfect as is desired, if the definition were coarse in the picture it would undoubtedly be obnoxiously coarse in a magnified copy. There are also other advantages to be gained by using a double combination: thus, for instance, if the original picture be a photographic view in which there are or ought to be straight lines, supposing the lines are curved inward, they may be rendered straight in the copy by placing the stop nearer the back lens than the front one, the right position being found by experiment; but if the lines curved are outwards at the extremities they could be made straight by putting the stop nearer the front lens.

Again: in taking a tall square building with the axis of the lens pointed upwards, the upper portion of the building would appear too narrow; and to correct this in a copy the picture must be inclined—that is, that end on which is the upper part of the building must be nearer the lens than the other end where the bottom of the building is, by which means the copy of the building would be apparently more correct than the original picture. Now, if a similar subject or view were taken from an elevated position, with the axis of the lens pointed downwards, contrary effects would occur, which must be corrected in copying by inclining the picture the opposite way—that is, the bottom of the view must be the nearest, and the top of it the farthest, from the lens. Also, if a like view, but horizontal (and which could not be taken any other way), were the subject, it could be corrected in a similar way. Suppose it was a row of houses, or, in fact, any other objects situated obliquely, the far end would be too much diminished, which could be righted in copying as above directed.

There are numerous distortions in portraits, one or two of which I here notice, because they may be corrected in copying. Probably in ninety-nine cases out of one hundred the camera is level with the head or at least the shoulders of the sitter, in which case the axis of the lens must be pointed more or less downwards, so as to include sufficient of the person, and, at the same time, to have the figure in proper position on the glass; consequently the plate is inclined with its upper part towards the sitter, and the result is that the upper portion of the person is apparently too large. If to this be added the mischief caused sometimes by a sitter leaning forward, the effect is highly disagreeable—quite a caricature, if the person be a John Bull sort of physiognomy. When such a "monstrosity" is produced, people may well exclaim that he or she is "too stout." The caricaturism of such a thing may be dissolved into a "correct likeness" in copying, by inclining the picture with the head of the portrait farther from the lens than the lower portion of it.

In taking a portrait three-quarter profile, it is often noticed that the arm, &c., of the most distant side of the sitter appear too small. Well that also can be remedied to a considerable extent by inclining the picture so that those parts which seem too diminutive are the nearest the lens, and that side which appears too large the farthest from it. When a picture has been taken with a very short focus lens, and a wide field included, and in which the marginal objects appear too large, it may be corrected in the best manner, in copying, by mere enlargement with a lens free from distortion, which is equivalent to its having been taken by a long focus lens, by which it appears more correct, as I shall hereafter prove: or it may be copied of the same size, and more correctly, by placing the stop nearer the front lens than the back one; but it will have considerable distortion as regards straight lines. Thus the value or use of copying is not confined to the bare operation of securing a copy, or even magnifying; but, from the cases stated above, the uses to which it may be applied are both numerous and valuable.

The solar camera is, or rather will be, a very important instrument, if the definition can be made satisfactory. With all respect for the opinion of M. Claudet, I believe the best position for the image of the sun to be is between the lenses instead of on the front one—that is with a portrait combination; for I am quite sure the astigmatism of the oblique pencils will be less.

[We are again compelled to demur to some of the propositions advanced by the author of the preceding paper.—Ed.]

LEAVES FROM THE DIARY OF A LATE ENTHUSIASTIC AMATEUR.

Edited by Sydney Sunshine.

If any of my readers who are photographic fledglings believe they would succumb to such misadventures as those related in my last chapter, let them resign the cultivation of the art at once, for they are not of the stuff of which the genuine photographer is manufactured. No amount of discomfiture will ever subdue *him!* He will make the imperial motto, "the guards never surrender," his own. He will possess real enthusiasm, without which nothing great, nothing enduring, was ever accomplished. Nothing good in art was ever done without intense feeling; but it must be feeling sternly controlled, and made only to impart additional strength to the will. Let those who have travelled some stages of their journey no longer lose sight of the end in the means. Let them cultivate processes less and art more: take some one process—wet or dry—and adhere to it. I may as well display my colours at once, and say I am an uncompromising wet collodionist, and utterly sceptical as to the advantages—taking a broad and comprehensive view of the subject—of preservative processes. I am not going to deny, with the beautiful specimens of the Manchester school before me, the possibility of getting good pictures by them; but the large per centage of failures must be taken into account, and then remember that every *one* of these failures is equal to *three* failures with wet plates, by reckoning the additional time and trouble expended in their preparation, not to say anything of the journeys to expose them and their subsequent development.

It is much to be feared that photography has been seized upon too readily as a means of getting pictures without the trouble of learning to draw, or of previous study of any kind. The amount of misapplied energy and the sums of money that have been wasted in the pursuit is incredible:—precious time, precious opportunities, precious metals! A few faint wishes and feeble aspirations will not achieve photographic excellence. Students should be more content to begin at the beginning. It may be believed that if they began by copying simple, common objects, as in drawing, and refrained from going on to others until they could do these under all positions and circumstances of light and shade, gradation of half-tone, depth or transparency of shadow, and so on, instead of beginning on the ambitious subjects they usually do—subjects which to properly depict have exacted a lifetime of study from men of genius in all ages—it would not be time wasted. Such study would not be lost, and would tell hereafter. Men too often look to bring about great results by violent, unprepared effort. But it is only in fair and forecast order, as the earth bringeth forth the bud, and afterward the fruit, that anything of worth can be produced in art. Take every opportunity of educating the eye. See every picture worth seeing. Even among persons of taste a truly discriminating appreciation of art is comparatively rare; and among these, again, that higher degree of cultivation which makes the taste sensitive as an electrometer is found in very few individuals. Endeavour

to render yourself alive to the finest shades of difference in everything. The incarnation of self-help has said:—"It is the close observation of little things which is the secret of success in business, in art, in science, and in every pursuit in life. Human knowledge is but an accumulation of small facts made by successive generations of men; the little bits of knowledge and experience carefully treasured by them growing at length into a mighty pyramid. There is no more important principle in art than this, though it should be cultivated with caution, or it will narrow and contract the mind. Greatness can only be rightly estimated when minuteness is *justly* reverenced. Greatness is the execution of minuteness, nor can its sublimity be felt truthfully by any mind unaccustomed to the affectionate watching of what is least." Turner used to say—"I never lose an accident or incident." There was nothing so little but he noticed it—nothing so great but he made preparations to cope with it. Thus he laboured patiently, almost mechanically, at first—his pencil slowly, but gradually, gaining power and grasp. So taught and prepared for his life's labour, alone among the fair English hills, he began to paint, with cautious toil, the rocks and fields and trickling brooks, and the soft white clouds of heaven.

It would be interesting, and far better, for the amateur-photographer to more often work with a purpose. Were he to aim at getting up portfolios of special objects, it would lend an interest to them whenever exhibited, apart from their intrinsic merits. There are innumerable classes of things in nature which would serve as "studies," and are especially suitable for amateurs—not that they are beneath the notice of professional men, but are unsuitable for those who have bread to win. A portfolio of studies of clouds taken specially for their infinite variety of groupings or cumuli, disregarding altogether the under-exposed foregrounds, or a portfolio of atmospherical *effects*, is well worth the effort. The fleeting and often beautiful vapours after showers in summer-time—the mist half-way up a mountain side, while its crest is bathed in sunlight—will indicate my meaning. Of course such things must be taken disregarding all other details save the particular effect we wish to secure. Turner painted Cuyp's favourite effect, *Sun Rising through Vapour*, for many a weary year. Take, again, every variety of leaf beauty—from the soft rose leaf to that of the Norwegian pine, or of grasses or of trees. It will help to make the eye more sensitive to beauty of form and curvature. Curvature is to lines what gradation is to colour. One of the highest qualities in Coreggio is his exquisite sensibility to fineness and intricacy of curvature. Or what is even better, take a collection of photographs of lichens and mosses. I have seen a portfolio of every variety of them, beautifully arranged, which were very impressive. Such things may to some appear simple; but are they so? Despise them not. Hear what one who has no small claim upon us as an art-teacher has to say about them:—

"Lichens and mosses (though these last, in their luxuriance, are deep and rich as herbage, yet both for the most part humblest of the green things that live)—how of these? Meek creatures! the first mercy of the earth, veiling with hushed softness its dintless rocks! creatures full of pity, covering with strange and tender honour the scarred disgrace of ruin—laying quiet finger on the trembling stones, to teach them rest. No words that I know of will say what these mosses are: none are delicate enough—none perfect enough—none rich enough. How is one to tell of the rounded bosses of furred and beaming green—the starred divisions of rubied bloom, fine filmed, as if the Rock Spirits could spin porphyry as we do glass—the traceries of intricate silver and fringes of amber, lustrous, aborescent, burnished through every fibre into fitful brightness, and glossy traverses of silken change, yet all subdued and pensive, and framed for simplest, sweetest offices of grace? They will not be gathered, like the flowers, for chaplet or love token; but of these the wild bird will make its nest, and the wearied child his pillow: and as the earth's first mercy, so they are its last gift to us. When all other service is vain from plant and tree, the soft mosses and gray lichen take up their watch by the head-stone. The woods, the blossoms, the gift-bearing grasses have done their parts for a time; but these do service for ever. Yet, as in one sense the humblest, in another they are the most honoured of the earth's children. Unfading as motionless, the worm frets them not, and the autumn wastes not. Strong in loveliness, they neither blanch in heat nor pine in frost. To them, slow-fingered, constant-hearted, is entrusted the weaving of the dark eternal tapestries of the hills—to them, slow-pencilled, iris-dyed, the tender framing of their endless imagery. Sharing the stillness of the unimpassioned rock, they share also its endurance; and while the winds of departing spring scatter the white hawthorn blossoms like drifted snow, and summer dims on the parched meadow the drooping of its cowslip gold, far above among the mountains the silver lichen spots rest, star-like on the stone, and the gathering orange stain upon the edge of yonder western peak reflects the sunsets of a thousand years."

MORE WORDS ON THE HARMONISATION OF THE PHOTOGRAPHIC SOLUTIONS.*

By Dr. J. Schnauss.

My readers will remember my essay on the agreement of the photographic solutions in the first number of this Journal. I had the pleasure of receiving from many quarters corroboration of the accuracy of the principles and directions demonstrated, without which assuredly no certain operations in photography can be expected. But the comprehension of my essay proved difficult to many who possessed no preparatory chemical information. In order to render clear the great importance and practicability of the harmonisation of the solutions, and also to give a general short survey of the chief points of the leading heads, I may be allowed to add the following.

The collodion process possesses an extraordinary delicacy compared with the early negative methods on paper, albumen, &c. We are indebted to the collodion process for exalted sensitiveness and beautiful results; but, on the other hand, there are important difficulties in its practice. The great point of the whole process—especially the speedy production of beautiful, strong negatives—depends upon the exact quantity of the acidifying principle in the three most important solutions:—1st, iodised collodion; 2nd, silver bath; 3rd, iron developer. As this acid principle may be affected by other opposing agents, namely, those possessing alkaline properties, we must bear in mind the neutralising power of the last class of bodies. In chemistry acids and alkalies are recognised, the first by blue litmus paper becoming red, the latter by the red litmus paper being restored to a blue colour. There are in photography far more delicate re-agents, so that the above-named test-paper is not required. We must, in order to make this investigation thoroughly, employ photographic agents—that is, take a proof portrait. From this we recognise amongst photographic bodies—especially those used to iodise collodion—two classes possessing strong well-marked polarities or photographic contrasts, an accurate knowledge of which contributes wonderfully to the perfection of the work. In the negative as well as in the positive collodion process the acid principle must absolutely predominate in the three above-named most important solutions, though according to circumstances more or less. This harmonisation takes place in the negative process by the addition of acetic acid to the silver bath and iron developer: in the positive process by the addition of nitric acid in the silver bath, and acetic (or nitric) acid to the developer. In order to bring a little of the acid principle into the iodised collodion, we must not make use of the above-named strong acids, on account of their containing so much water, but we take those known only as photographically acid materials, namely, free iodine, or an iodide which generally contains free iodine. But this addition must be made with great caution, for a superabundance destroys the sensitiveness. It is therefore strongly advised to iodise two sorts of collodion, of which one shall contain prominently the acid principle, and only to add it in small portions, as found needful, to that in ordinary use. We must, above all, in practically accomplishing the equilibrium, have regard to the age of the solutions. If all three solutions are newly prepared, we shall not immediately obtain good results, even if they are compounded after the best formulæ. In order to obtain clear strong negatives we must considerably augment the acetic acid in the silver bath and the iron developer. We give now the best mode of preparation of all three solutions, always with the proviso, however, that they must first be of a certain age or maturity before their entire superiority can be shown.

We compound the collodion from good freshly-prepared pyroxyline, and a mixture of two parts of ether and one part of absolute alcohol of the best quality. When poured on a glass plate the collodion should flow well and equally, without forming streaks (otherwise it is too thick, and has too much ether), not setting too quickly, and when pushed with the finger still possessing enough body to hold the iodide of silver formed by immersion in the silver bath. The alcohol is not necessarily absolute; but, if of lower specific gravity than 0·835, it is injurious.

We prepare some days previously an iodiser by dissolving two parts iodide of ammonium, one part iodide of cadmium, and half a

* From *Photographisches Archiv.*

part bromide of cadmium in forty parts alcohol, of 0·835 specific gravity. This solution must first become quite clear by settling. A little bromide of ammonium is formed by the double decomposition of the iodide of ammonium and bromide of cadmium, and this is but slightly soluble in alcohol. Many impurities also of the iodide and bromide salts sometimes remain behind, which are mostly insoluble in alcohol. It is advisable to let the iodiser acquire a sherry colour. For this reason a yellow iodide of ammonium is useful. We add this iodiser again and again to collodion until a glass plate coated therewith dipped in the silver bath shows a sufficient density of iodide of silver. But we must, in order to judge with certainty, wash the back of the glass. We can also prove by pushing it together with the finger the consistency, and the powdery or skinny nature of the film. We shall thereby perceive the various influences of certain iodides on the collodion. Thus the iodide of cadmium makes it very dense, the iodide of lithium powdery, &c.

To produce a good equal iodide of silver film by means of ethereal collodion, the proportions of water contained therein is of the greatest importance next to the iodising material. I therefore set about a number of experiments, which I will briefly relate, using the same iodised collodions, only differing in the amount of water contained — each kind containing sixty parts ether, forty parts alcohol, one part pyroxyline, one part iodide of ammonium, and half a part iodide of cadmium.

1. *Experiment.*—The iodised collodion contained ether of 0·725, and alcohol of 0·800 specific gravity. The colour was reddish-yellow. It dried quickly on the plate, therefore the iodide of silver was formed somewhat unequally in consequence of its repelling the silver bath on immersion. The film possessed a firm consistency, and could easily be transferred. It showed no sign of tearing or cracking, as sometimes happens when too much water is contained in the collodion.

2. *Experiment.*—Ether of 0·734, alcohol of 0·803 specific gravity. Colour dark yellow; dried rather quickly; showed no crack or crapiness.

3. *Experiment.*—Ether of 0·734, alcohol of 0·825, specific gravity. Colour rather lighter yellow, drying very quickly on the plate, and with firm cohesion. The negative proof was good, and after drying showed no sign of cracking. The iodide of silver formed very quickly. From these experiments I would consider the amount of water contained in this third sample the most correct: if it be increased, the colour of the collodion becomes a still lighter yellow. The iodide of silver is certainly very even, but it shows already fine streaks and cracks, particularly in the direction of the flowing off of the collodion, and on the spots where it has condensed. By further additions the film was destroyed through numberless flaws in drying.

In reference to the best proportions of iodide and bromide salts in the iodiser, I have made some experiments with those most used, namely, with iodide of ammonium, iodide of cadmium, and bromide of cadmium, which confirms me in the opinion that the proportions between the three above-named salts for our climate and by medium light are the best:—Two parts iodide of ammonium, one part iodide of cadmium, half a part bromide of cadmium.

COLLODION SHOULD BE ACID, AND WITH A LARGE PROPORTION OF IODINE.*

By M. Mc-A. Gaudin.

It is now admitted in photography that to act quickly collodion must be as exempt as possible from acid and free iodine; however, all collodions which act well are acid and coloured by free iodine.

An excess of acid in the silver bath, in the collodion and in the developer, is the reason that the impressions are formed very faintly, and it even sometimes happens that there is no impression at all: in this case the collodion is untouched, and preserves its beautiful opal colour. Excess of acid is then prejudicial; but to succeed better, and to attain the greatest quickness, a certain proportion of acid is necessary in the silver bath, the collodion and the developer, and more free iodine in the collodion.

I have had occasion this week to verify this necessity. Having undertaken a research upon the sulphate of iron developer, I passed a whole day without being able to obtain the trace of an impression, having at every turn a general fog, which after the soaking in hyposulphite presented a surface of silver. I really did not know on what to lay the fault: I even looked into my object-glass to see if the light passed through it. As my silver bath was one which the day before with the same collodion had given me (making a use of a sulphate of iron developer) some good proofs, I believed at first that the evil arose from my new preparations of sulphate of iron, which, however, I varied in all possible ways: I had red, yellow, green, and brown, which I acidulated more and more. At length I remembered that my collodion of the day before had been added to from normal collodion to give it more strength. I was far from thinking that the failure occurred from that; however, on trying some collodion that was free from this normal collodion, all my sulphates produced good proofs, and the refractory collodion after being mixed with a red collodion very slow by itself, produced some good proofs with the same sulphates.

Thus sometimes there is formed in the normal collodion a compound reduction, formic acid, aldehyde, &c., which should be neutralised by the addition of an acid or of a large proportion of iodine. The addition of an acid does not always make the collodion red: the crystallisable acetic acid, for instance, even after several days, does not render the collodion red; and a very moderate addition of it, two or three drops to a bottle of three ounces, is an excellent thing when the proofs are foggy.

An addition of iodine produces the same effect, but in a very small degree. Generally in small bottles good collodions have a lemon tint, which in large quantities inclines to orange; and if collodion is dropped and runs well upon a piece of damp litmus paper it will reveal its acidity.

The silver bath also should be acid, particularly in using ferruginous developers. It has been almost impossible for me to obtain anything passable with a silver bath which is neutral with regard to the litmus paper; but in adding one or two drops of nitric acid, enough to redden the paper, all goes well, and still better with a collodion containing acetic acid.

Thus reducing agents ought to be banished from the collodion as well as from the silver bath. This leads us quite naturally to the case of M. Ferrier, who seems much hurt by some rather sharp expressions which I used with regard to him. I was much annoyed by having spoilt all my baths, and wished quickly to guard against this inconvenience in the case of others. To-day M. Ferrier pretends that there has been a misprint; that he said to add the formic acid to the developer, and not to the silver bath. As for me, I have only read the number of the *Bulletin de la Societé Française de Photographie* for the month of May, which runs thus:—

"MM. Ferrier (father and son) and Soulier presented the Society with several quite instantaneous stereoscopic views, representing different views of Paris, with people, horses, and vehicles in motion. M. Ferrier remarks the difference which exists between some proofs of this kind and those for instance in which are represented the waves of the sea, which can accomplish a certain movement while the impression is being taken without losing its distinctness. On the contrary, in the present case, in order that the proof may be clear the impression must be strictly instantaneous. The only particular that M. Ferrier had to notice in his preparation consisted in the addition of a small quantity of formic acid to the silver bath."

After assuring myself by a number of trials that the use of the formic acid in the silver bath is constantly followed by a general fogging, with the absence of any impression, and being persuaded that M. Ferrier knew it as well as myself, I have felt obliged to protest loudly against such an announcement. If the formic acid is to be used in the developer, and not in the silver bath, the case is entirely altered; but M. Ferrier should not believe himself sheltered from all reproach by saying it was "a misprint," for this was a very serious mistake, and he could have given us immediate notice through the journals. But it is probable that M. Ferrier has never tried formic acid in the silver bath, and that he is not therefore aware of how many mistakes his badly-expressed communication would be the cause.

[Formic acid in the developer was proposed many years back (six or seven at least) by Mr. F. Maxwell Lyte; but we believe that if M. Gaudin will try it he will be convinced that it has no such beneficial effect as M. Soulier claims for it.—Ed.]

* From *La Lumiere.*

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. VIII.

The last number of my notes closed leaving me on the summit of Olivet, taking my first views of Jerusalem from that height; and I promised in my next to say a little of the view then stretched out before us, and, at the same time, to give a picture of my camera arrangement and a description of it. The latter part of my promise I fulfilled in the last number of the Journal; the former

I shall do now, and shall describe what is seen from the Mount of Olives, looking towards Jerusalem.

What is actually *to be seen now* I have delineated by the unmatched powers of our wizard-like art, in a manner that no tongue or pen ever could approach—as no eye ever saw, not in fifty visits; for it is a fact that our artificial chemically-prepared retina, with its brass-bound eyes, sees more, and retains a more minute, more comprehensive, and more perfect picture of what is presented to it, than ever the finest and best-trained human organisation for the same purpose did, even with hours of examination (exposure) and numerous trials. Our picture, if creditably done, satisfies the educated eye of the historian, the archæologist, the man skilled in the gigantic marvels of geology or the minute wonders of botanical science. But why boast of the powers of our art here? My readers do not require me to tell them what photography can do. And it has, no doubt, struck every one of them how much more they could see in a good photograph than they really saw of the place it represents with their own visual organs. Is not that an important consideration in treating of the relative merits of the productions of the artist-photographer and the artist-painter? David Roberts *might* depict as *he* can—some would say as *he only* can—all he saw; but how much was there he did not perceive! There is no use—the reader may remark—praising my photograph of Jerusalem, which I am not to present to them, and neglecting to give the description which I promised, and which I ought to have had half finished by this time.

The Jerusalem of two thousand years ago had then reached its maximum in extent and in population. According to Josephus, it stood on four distinctly-marked eminences. It was, as it now is, somewhat of a quandrangular form, and, as now, was enclosed by walls. Zion was the highest and largest of these elevations on the north and west, on which the city at first alone was built. Moriah directly to the east of that on which the temple stood. To the north of Zion, and separated from it by the Tyropœon Valley, stood Acra; and to the east of that, and north of Moriah, was Bezetha, or the new city. The topography of Jerusalem is one of the vexed questions of which that city furnishes so ample a crop; and the above brief outline of it contains matter for filling more ponderous tomes than there are lines in it. Suppose it pretty correct, nevertheless. The modern city covers part of each of these four more or less separated eminences. The modern walls are in a very good state of preservation, and serve as an ample protection from the lawless part of the inhabitants of the country, but would be of no avail if the artillery of western nations was opposed to them, not to speak of Sir William Armstrong's rifled irresistibles. These walls, as they now remain, were erected some three hundred years ago; but many parts bear undoubted evidence of Jewish origin. Parts here and there, which have escaped the destruction which has so often left the city as a heap of rubbish, stand out as it were to proclaim to whom it of right belongs.

From Olivet, as I have said, the whole city lies map-like before the spectator, forming a really fine picture: if the scriptural and historical associations be taken into account it is, perhaps, the grandest view in the world. Just beyond those hills which bound the view is Bethlehem, where Christ was born. Nearer to the left, densely covered with houses, is Zion, worthily deserving, my readers would think, the eulogy of the Psalmist:—"Beautiful for situation: the joy of the whole earth is Mount Zion." That is the Jews' quarter of modern Jerusalem, and it encloses as much squalid poverty as the same space ever did any where at any time. Nearer, in the same line, is Moriah, on which once stood the Temple. Its site is now occupied by what is called the Mosque of Omar. How much or how little of it is truly either of Omar or his followers' erecting is doubtful. There is, however, no doubt that the bigoted followers of the false prophet have possession of it, nor is there any doubt that they grudge even the privilege of looking at it from some distance. Since 1854 Moslem intolerance has had to bear with now and then seeing Christians pass hurriedly in and out of this holy place—partly through the influence of western diplomacy, but mostly by the power of Frank gold. Between the spectator and the city is the Valley of Jehoshaphat. In the bottom of it—as it were at our feet—enclosed by an unsightly stone wall, are those same olive trees which eighteen hundred years ago were the silent witnesses of Our Lord's anguish on that dark night of sorrow. On the right, in the middle of the houses, now rises a broad flat dome, said to cover the Sepulchre of our Saviour. Perhaps it does. Sad to think how much blood has been spilt among His nominal disciples fighting for the guardianship of this shrine!

But it were a truly hopeless task even to name the objects of interest in the view, far less to mention the associations connected with them. The spectator has but to think that his feet rests on Olivet, the mount of the ascension; that before him lies all that now remains of one of the earliest centres of civilisation, the capital of one of the oldest and most remarkable peoples—if not the birthplace, the cradle of our religion—Jerusalem, the city of our Lord.

My views turned out remarkable successes, on development, and I went to bed in a high state of excitement about the perfect pictures I had been able, at my first trial, to produce. Alas! for the uncertainty of everything human! And photography is no exception to the all-pervading rule long ago pronounced by the wise man: have we not all experienced that it is vexation of spirit? In plain language, I found my beautiful views had, in drying, cracked in a thousand places. I tried to save them from further injury by varnishing, but the *cure* aggravated the disease: those not uselessly split before, were quite so now. This was a trouble I had before known nothing of. What caused it, and how I was to *avoid* or *cure* it, seemed at first quite a mystery to me. The only thing I felt quite decided on was, that whatever it was that produced it, I *must overcome the difficulty.* And this I did, and very simply; but that will come in better in connexion with my visit to Bethlehem, which I shall give in my next.

About this time an incident occurred to me which illustrates a phase of the social character of the people, and also shows the nature of the internal government of the country; and which, though in point of time it is a little out of the order of my narrative, I prefer to give an account of now. I have before mentioned that Max's hotel overlooked the Via Dolorosa: I should rather have said a part of that sorrowful way. I had instructions to take a picture of it. The path which bears this name, from the Hall of Judgment to the traditional site of the Crucifixion, is a long and crooked street, turning more than once at a right angle, or nearly so. A Latin Church publisher would have demanded at least as many views as there are "stations," according to the traditions of that church. I was to have but one. After a careful survey of all the possible and convenient points of view I determined that the view from the roof of my hotel was the best, taking in, as it did, the Ecce Homo Arch and the undoubted site of the Hall of Judgment, and just overlooking the traditional site of the house of Dives. One afternoon early in June—the 5th I think—I had some sensitive plates which I felt too lazy to go out to use. Had I been half as Oriental as I should have been by this time I ought to have willingly enjoyed the rest and quiet which I had fairly, I thought, earned by a very good morning's work. My western habit of activity soon suggested that if I was not to go out I might, however, take a few views from the house-top, and thus get at least this Via Dolorosa view done which I had to do sometime, and enjoy a rest at the same time: Lord Brougham's kind of rest it was to be, to be sure,—change of labour. My dragoman was sick at the time. We had just returned from a visit to the Dead Sea and the Jordan, and the Plain of Jericho had been too hot for him: poor fellow, he was very ill. I had no assistance at hand to carry my camera and stand to the house-top for me. All the hotel people were out but an old woman, the cook. Ferraj, my jet black Nubian, who generally carried my traps, I had dismissed for the day. I had got several plates exposed, and was in my own quiet undemonstrative way enjoying the evening breeze and the deeply interesting view which lay before me, when my attention was drawn to some strangers in the court below. One I saw was a rather good-looking and very handsomely-dressed young Nubian, accompanied by two young Arabs. I at first supposed that they belonged to the suite of some distinguished Frank visitor or pilgrim who proposed honouring Max's with his patronage. Soon I found the new comers meant to honour me with a nearer acquaintance. As they approached the part of the house-top on which I had fixed my camera I saw they seemed excited. The black man now seemed to address me; but as my interpreter was below out of the reach of his or my voice, and I knew scarcely as much Arabic as could obtain for me bread and water from those who were very willing to understand me, this appeal, demand, or remonstrance was utterly lost upon me. My black visitor soon saw that, and appeared about to speak to me in a more unmisunderstandable way. He was apparently just about to toss me and my camera into the yard below when I, by the best exhibition of the universal language of signs I could command, gave him to understand I would save him the trouble by carrying my property and myself as quickly as possible, consistent with the safety of both, to that part of the house to which he seemed desirous they should be removed. My feelings, I must confess,

unequally matched as I certainly was, would have induced me to inquire at once into his sable majesty's right thus so imperiously to issue his commands. A moment's reflection, however, convinced me that whoever he was, and whether right or wrong in his demand, my best course *then* was perfect submission. I need not say that I undid all my screws in double-quick time, under the terror of every moment seeing the whole of my apparatus dashed into a thousand pieces, my black friend and his companions became so outrageous. Having got all into a transportable state, I breathed more freely. I had learned sufficient of the Oriental manner to be aware that if I could only afford to seem careless, though my intruders knocked all my property over the house—and, above all, if I could only outdo them in making a noise, I was perfectly safe. I deposited my cameras, well strapped together, on the centre of the house-top, and, throwing down the stand carelessly near them, I took up my umbrella and threw it right over to the court below, with a bang as if I meant to send the rest after. That had a good effect. The invading force were not sure of me. I lifted the bundle of cameras in my arms and retreated by the shortest route to my rooms below, leaving the enemy in possession of the field and my tripod. I had barely got my cameras and lenses into a safe place ere my uninvited guests made their appearance in my rooms. I made signs indicative that they were to leave, and probably said so in my vernacular. I tried the whole of the Arabic I could muster that at all bore on the position of parties. All was of no avail. My assailants became now more outrageous, unfortunately when I was less likely to bear their unprovoked injuries. The black man now lifted his hand to strike me. He had previously pushed me about, and tried to kick me. I quietly retired to my room, and produced my revolver — innocent of powder and shot. Its effect was magical: my assailants ran instantly, never turning till outside the house, where they were followed by the old cook, who had been trembling outside my rooms. She locked the door as the intruders escaped. They were, however, no sooner out of the house than they seemed equally anxious to get in again. They commenced knocking at the outer door, and soon collected a crowd of sympathisers, who joined in heaping on me such imprecations as only an Oriental can conceive and as only an eastern language can, I believe, adequately express. It is no curse at all that does not include one's father and mother and all other relations back to three or four generations, and, of course, taking in one's children. Poor innocents!—a bachelor's children! *they* won't feel even an Ishmaelite's curse. A pretty kettle of fish this! I thought. Here I am nearly alone, surrounded on the outside of a thin wall by an infuriated Moslem mob! What am I to do? Fortunately there were two doors to the house, and it turned out that Mrs. Max had had a young Jewess sewing in the house, and that the old cook had despatched her at an early period of the row, by the other door, for the hotel keeper, and such other help as would be necessary. He soon arrived, and with him an officer of a kind of military police of the Pasha. There was a tremendous noise. I was told that the black man demanded that I should be taken to prison. Of course I did not relish that; but told Mr. Max to tell them that I had nothing to do either with the Pasha or his soldiers, but that, if they had any complaint to make against me, they could all follow me to the British Consulate, where I would now go to enter my complaint against the black man and his confederates. The officer at once agreed to this course: so to the Consulate we all repaired—a very doubtful procedure, under the circumstances, I now think. As it turned out all went well, but it might easily have been otherwise. I was known to a number of the idlers in the quarter, and it appeared that either by myself or through the talismanic medals bearing Her Majesty's effigy, which I occasionally distributed among them for service done, I had made a favourable impression on them. When I appeared outside on the way to the Consul's I was recognised by these, and allowed to pass on unmolested by all.

Arrived at the Consulate I was sorry to find the Consul had gone to Jaffa, and that there was no one but the Chancellor. As soon as an approach to silence could be obtained, I stated my case, as I have detailed already. My sable opponent stated his charge—or rather the officer did for him—and now, for the first time, I learned what all the noise was about. There could not be so much mischief without a woman being in it. It appeared, from the statement now made, that Max's house-top directly overlooked the hareem of the Pasha and the garden attached to it, and that at the time I was taking my view of the Via Dolorosa the ladies of the Governor's household had retired into the garden to enjoy the invigorating evening air. The ladies supposed I was spying at their beautiful faces, and, no doubt, falling hopelessly in love with their lovely sultanaships. It was further stated that the black gentleman who had behaved so heroically was one of those nondescript gentry who attend on the unfortunate daughters of Eve in the East. His *mistress* or mistresses—for I never learned if there was one or more, or how many—had ordered him to go and have myself and apparatus removed. On hearing the charge, the Chancellor began to say that it would be necessary to take the black ennuch into custody. No sooner was this uttered than out he ran, leaving us to settle all else as we best could. I explained at once that I had never seen the ladies of the hareem; nor did I know where the garden was. After the Chancellor had assured me that even if I had known the ladies were there, and had even been, as they supposed, looking at them through a glass, still I had the right to do so. And again: that, though I had been breaking the law, forcibly entering the house of one under the protection of a foreign flag was a crime. I left the office after arranging to go with the officials of the Consulate to the Seraglio next day and make my complaint known to the Pasha.

AN EASY METHOD OF REDUCING THE SILVER FROM OLD BATHS, TO RE-CONVERT IT INTO THE NITRATE.*

By M. Me-A. Gaudin.

Of all the processes that I have tried for reducing silver the following is much the best, and the most expeditious. Having to do so, I reduced the silver from its chloride by zinc and diluted sulphuric acid, then re-formed the salt of silver, after having acidulated it by nitric acid. This last method is very expeditious, but the reduced silver is always mixed with acetate of silver, which produces, on dissolving it in nitric acid, a magma of a brick colour, which is scarcely soluble in water, and produces very bad baths. The reduced silver from the chloride is more favourable, but there always remains some chloride unacted upon.

In reducing the chloride in the manner in which I have indicated, the nitrate of silver formed is very pure, and the reduction is made with the greatest facility when one operates upon small quantities—the only case in which the process is applicable, and which makes me recommend it to amateur photographers.

After reducing and washing the chloride of silver, produced by pouring some hydrochloric acid into the ordinary silver baths, and separating this chloride by aid of a filter, it is placed together in the hollow of a piece of charcoal, which is covered with a piece of incandescent charcoal. I then blow upon this charcoal with an ordinary bellows in such a manner that the flames of the charcoal pass over the chloride. This melts first; then, on continuing to blow, it is very quickly reduced into a piece of metallic silver which is almost entirely free from lead—the only metal which produces an insoluble chloride like that of silver. During its reduction the chloride disengages white fumes, and the operation is ended when these cease to appear.

MICROMETERS.†

By Thomas Woods, M.D.

I saw last week in some newspaper a notice that in America micrometers have lately been made by means of photography. I do not know from what publication this notice has been taken; but as I have been for the last month or so engaged occasionally in making experiments with the same intention as an original idea, I send you a short account of what I have done, for publication if you think it sufficiently interesting.

My endeavour was to get a glass slide for a microscope marked so as to measure very minute objects; and as the micrometer I have (measuring $\frac{1}{100}$th of an inch) was useless for the purpose I had in view, it occurred to me that by the diminishing power of the camera I might succeed in obtaining smaller divisions. I tried first for pictures of dark lines, $\frac{1}{10}$th of an inch in breadth, on a white ground, reduced to a small compass, but I did not succeed even with a very small aperture to the lens. I then substituted lines $\frac{1}{4}$th of an inch in breadth removed to a greater distance, and I got a pretty sharp picture; but I found that the sharpest and best-marked picture of distant lines I obtained was given by opaque bars, placed so that the light from a clear sky came to the camera between them.

By nailing rods of blackened wood, $\frac{1}{4}$th of an inch broad and $\frac{1}{4}$th of an inch asunder, across a frame, and placing this at a suitable distance, with a clear light behind, and using an aperture of about

* From *La Lumiere*. † From the *Philosophical Magazine*.

⅛th of an inch in diameter, I easily obtained well-marked and sharp lines the $\frac{1}{10000}$th of an inch apart and the $\frac{1}{10000}$th of an inch in breadth, sufficiently accurate for all the purposes of a micrometer. The picture of the lines requires to be covered with transparent varnish to prevent rubbing. I have taken the picture on very thin talc, and cemented it to glass with the collodion beween the plates, and for object-glasses of small power I have found it answer; but the thickness of the talc is too much for the higher powers, as the object viewed and the lines do not sufficiently agree in focus.

I suppose the reason why lines with spaces between them give a better picture than black lines ruled on a white ground is because there is no irradiation of light from behind—at least, not nearly so much from the spaces as from the white ground. At all events, whatever the cause may be, I have found the lines with the spaces give a much better and sharper impression.

The picture of the lines should be a positive one, and very clear. I found the collodion prepared with the iodide of iron, according to the formula given in this Magazine, July, 1854, to act admirably. It must be very sensitive, on account of the smallness of the aperture necessary for the required sharpness.

I have no doubt that much finer lines than these I have got might be obtained by the same process.

THE NEW PERMANENT PRINTING PROCESS.

By Joseph Eugene Balsamo,
Professor of Philosophy at Lucca.

The learned professor, having been occupied in electrical experiments with reference to telegraphy, made a discovery that he has since applied to photography, and communicated the result of his labours to the French Photographic Society.

The primary discovery was the solvent property possessed by hydrochloric acid for phosphorus, from which the latter is again thrown down in a flocculent state, under the influence of light. It occurred to M. Balsamo that it might be possible to produce a change of molecular condition in some substances not sensitive alone to the action of light by aid of the phosphorus precipitated from the hydrochloric acid. Long observation, and experiments persistently carried on, demonstrated the fact that scarcely any salt that is soluble in the hydrochloric phosphide can resist the modifying action of light—that used in preference for photographic purposes, in consequence of its abundance, cheapness, and sensitiveness, being acetate of copper.

The process as at present employed by the inventor is as follows:—Phosphorus is digested for a considerable time in hydrochloric acid at the ordinary temperature; or, if time be an object, at a temperature of about 120° to 140° Fah. The older this solution becomes the higher the photogenic properties it acquires. After saturating the hydrochloric acid with phosphorus it is diluted with acetate of copper until the liquid assumes a deep olive-green colour.

To prepare the paper, the liquid is poured into an earthenware or porcelain dish, and each sheet is immersed therein for three or four minutes. The soaked sheets of paper are then piled one upon the other, and separated again several times, in order that the solution, which has a tendency to evaporate, may more perfectly penetrate the pores of the paper. After lying together for five or six hours the sheets become thoroughly impregnated: they are then carefully separated, so as to avoid creasing or tearing them, and are hung up to dry in a place perfectly protected from dust and light.

It is indispensably necessary that the paper shall be thoroughly well dried, for after it has been immersed in the sensitising bath it becomes exceedingly hygroscopic, and the least trace of humidity diminishes its sensitiveness.

In taking an impression upon this paper it is requisite to use the precaution of placing behind it a piece of blotting-paper, in order that the moisture disengaged under the influence of the calorific rays may be able to escape. The paper is exposed behind the negative until it has attained a grey colour. When withdrawn from the pressure-frame, the paper is exposed for about five minutes to the vapour of sulphuretted hydrogen, which has the property of attacking those parts upon which the light has acted.

The impression being thus fixed, the paper is washed in abundance of water, to remove the superfluous salt of copper, and the details appear with greater sharpness. In order to render the impression more stable, and also to tone it, the proof is soaked in nitrate of bismuth. But, as there is formed in the water an insoluable sub-salt, it is needful to acidify the water with a little nitric acid. The more dilute the solution the more slowly is the impression acted upon, but the better the details. In the bismuth bath there is a true molecular substitution of bismuth for copper; indeed, at the end of a certain space of time, one may observe that the liquid assumes a green hue, due to the nitrate of copper formed, and the bin-oxide also is deposited.

Impressions obtained by this process are permanent; for an external coating of oxide of bismuth is formed, upon which neither chlorine nor any other substance likely to come in contact therewith will act destructively.

Chlorine, one of the most active photogenic elements, is also especially a de-hydrogenating one, and its oxidising effects are an indirect consequence. From it arises the transformation of the metallic sulphides of the proofs into colourless sulphates.

If we withdraw the chloride (and there are means of so doing) from the pure silver proofs, we have impressions more permanent and less sensitive to destructive influences, as proved by experiment.

The photo-chemical phenomena manifested in the preceding process are as follow, viz.:—Light acts directly on the phosphorous, which by its molecular action reduces the salt of copper and restores it to a state of bin-oxide. Indeed, if, instead of fixing the image by means of sulphuretted hydrogen, the paper when withdrawn from the negative be soaked in water, the impression will be visible, if viewed by transmitted light, formed entirely of phosphorus.

Copper in a state of bin-oxide is easily reduced by hydrogenous substances, consequently a short exposure to the fumes of sulphuretted hydrogen is sufficient to fix the impression in the form of a sulphide. But as bi-sulphide of copper, which is very unstable, will change into a sulphate of the same base and end by the picture becoming entirely obliterated, it is replaced by bismuth as before described. This bismuth, substituted for copper, constitutes the impression, fixes it, and tones it more or less deeply according to the length of exposure, intensity of the light, and strength of the bismuth bath. If a still darker tone be deemed desirable it can be obtained by soaking the proof in a weak bath of nitrate of silver, which does not deteriorate, as with bismuth it plays the part of the negative metal.

M. Balsamo has promised to communicate at some future time several curious observations that he has made during his photographic experiments with various metallic salts.

Record of Photographic Inventions.

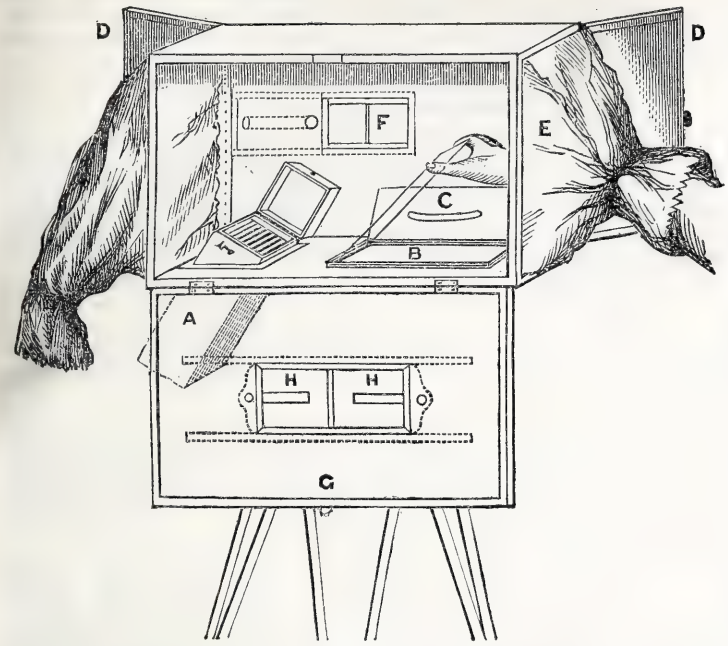
By Samuel Highley, F.G.S., F.C.S., &c.

[Notice.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

CHANGING BOX FOR DRY PLATES.

It often happens, when travelling in mountainous and out-of-the way places, that there is a difficulty in finding a room or cupboard that can be made secure against stray beams of light, wherein a set of exposed dry plates could be taken from their frames and replaced with unexposed ones. Even in the modern houses of our watering places I have experienced this difficulty, and have had to wait till dusk before I dare set up my yellow lamp (see page 258). As the great advantage of dry plates is to dispense with the encumbrance of a tent, any such *hot-hole-of-Calcutta* inconvenience is not to be thought of. As, however, the camera, its frames, and the plate-stock boxes *must* be packed *in something, there can be* no objection to converting the packing case into a dark changing box. This I have done in the manner I shall describe.

Without doubt, several plate frames, single or double, is the safest and most convenient way of carrying a series of dry plates for a day's work; but, when the dry process was first introduced, I arranged the box I am about to describe so as to work with a single frame, and to those who begrudge ten or fifteen shillings for each plate frame this contrivance may present advantages. It is, however, equally applicable for the purpose of transferring a number of plates in the way I have already referred to.



The arrangement consists of a box seventeen inches long, eleven inches high, and eight and a-half inches deep, with a door to let down in front. This contains a stereoscopic camera, focussing glass and lens, plate frames, tripod head, and two boxes, each holding one dozen prepared plates, all *firmly* packed by aid of the focussing-cloth. Two straps, connected by a handle, pass round each end of the packing-case. After screwing the box firmly on to a tripod stand, and arranging the camera on the top, a plate-box, having a fillet running round the outside in an oblique direction just beneath the lid, is passed through an aperture in the bottom of the box till the fillet fits into a ledge, and assumes an inclined position, as shown at A, *Fig.* 1. An empty plate frame, B, is next laid on the bottom of the box, and fixed against a projecting bead to keep it in position; the lid, C, is thrown back; a door, D, at the side is then opened, and a black cloth collapsing sleeve, E, pushed out. A sliding shutter is then drawn back from a yellow window, F, at the back of the box, and the flap door, G, closed and locked. The shutters, H H, on the outside are then unclamped and drawn back from a large yellow glass window let into the door to enable the operator to see how he is manipulating within the box, which is then obviously impervious to actinic rays. The right hand is then passed through the sleeve, E, the lid of A unhooked and turned back, the corners of the first plate (having the sensitised film turned towards the right hand) seized by the thumb and forefinger and withdrawn from its groove, brought over the frame B, the bottom edge lowered on to the silver corners, and the plate dropped into its place. The lid, C, is then closed and hasped; the same with the lid of the plate-box, A. The hand is then withdrawn, the door, G, opened, the plate frame, B, removed and placed in the camera. After the view is taken the frame, B, is placed in the box, and, manipulating in a reversed order, the exposed plate is returned to its groove, and the next glass placed in the frame, and so on for the whole dozen plates.

If double plate frames are employed, it is then necessary to have another door and collapsing sleeve on the left-hand side of the box, as another hand is required to facilitate fixing the flap that is placed between the two plates, and also in reversing the position of the frame before the second plate is placed in position. In working with three double-plate frames, after they are once charged from either of the boxes, the six exposed plates are returned to the empty grooves, and fresh ones taken from the other end of the box. In this case it is better to fix a roughened piece of black wood midway across the plate-box, so as to serve as a guide, and prevent a plate being placed in a wrong groove.

By this arrangement, with careful manipulation, the plates can be changed in the open field.

DALLMEYER'S STEREOSCOPIC AND VIEW CAMERA.

Mr. Dallmeyer has this season introduced a very convenient form of camera that places, at the option of the operator, the means of securing either ordinary views, up to 7¼ by 4¼ inches, or stereographic pictures. This is obviously advantageous, as every photographer must at one time or another have planted his stereoscopic camera on some spot that to his chagrin he has found unsuited for securing that particular class of picture; but, if he could only have devoted the entire plate to the view before him, he might then have secured a gem or a glorious *souvenir* of a pleasant jaunt. As cases in point:—If the travelling photographer happen to plant his camera on Roundham Head, at Paignton, in the belief that he is about to secure a stereograph of that magnificient *coup d'œil* of the house-covered hills of Torquay, visible from that point, he will be wofully disappointed; for, on looking to the focussing-glass, he will find that instead of distance lending enchantment to the view, as far as the capabilities of a stereographic lens are concerned, it has so dwarfed the houses as to render them mere undefined specks, and he must travel some two miles townwards to Tor Abbey Rocks before he can secure a commanding but far from so imposing a view of "The Garden of Devon," adapted to the attainments of a stereoscopic camera as ordinarily constructed. If, on the other hand, by changing his twin lenses for *one* that would cover the entire plate, he could bag a view that many a photographer would envy. A similar spot is in our recollection. A little distance out of Shanklin, in the Isle of Wight, on the way to Bonchurch, the high road passes up and round a steep hill. If progressing by coach or trap the driver will never fail to request the male passengers to alight, cross the stile and *Shanklin Cowleas*, and meet him at the top of the hill. From a little terrace at the top of this meadow a glorious view of Sandown Bay, terminating in the headland of Culver Cliff, with the woods of Shanklin nestling in the foreground, spreads itself before the delighted photographer's gaze; but it is a view that must be secured on nothing less than a half-plate, if the characteristic details of the scene are to be brought out.

Mr. Dallmeyer's camera is thus constructed: it has a rigid body, the back being fixed whilst the front advances, the focus being secured by a pinion stretching right across the front of the body, and working in two accurately cut racks, fixed on each side of the baseboard. A fine and easy motion is thus secured over a range from three-and-a-half to seven inches.

The body is divided into two parts, longitudinally, when mounted with stereoscopic lenses, by one of the best expanding partitions that has hitherto come under our notice: it is formed of a plate of metal, fitted between two thin slips of wood, telescope fashion, and it is at once neat and efficient. If a single view is to be taken, the telescopic partition, together with the front that carries the twin lenses, is removed, and replaced with one fitted with a flange for a No. 1 triplet lens, that form of combination giving exquisite little pictures seven inches by four and a quarter, free from distortion, though its maker only advertises it to take views six inches by five. The frame for wet plates has a carrier for the larger glass, and another, fitting within it, for the ordinary stereoscopic size. Double plate frames for both sizes are also supplied with this form of camera; and, as the back portion of the camera is fixed, a "repeating" plate frame could readily be adapted to it when required. As the dimensions are but a very slight increase on those of the ordinary stereoscopic camera, and the advantage gained worth every photographer's attention, we believe that Mr. Dallmeyer's improvement will become a general favourite with tourists.

THE SOLAR CAMERA: ITS MANIPULATIONS AND RESULTS.*

By Sydney Smyth.

Having been invited by your worthy Secretary to furnish a paper on the solar camera, I shall with great pleasure "put in an appearance" to his friendly summons, and with your kind permission will read a short record of my manipulation, illustrated by specimens of the various processes I employ, and the negatives I deem best for producing the most satisfactory results.

Before proceeding to the more practical part of my subject, I would beg to say a few words in defence of this really beautiful photographic instrument.

Most of you are doubtless familiar with the various methods of enlargement recommended before the introduction of this instrument, and may have perhaps seen the various clumsy implements contrived to produce the desired results.

I remember on one occasion going into the warehouse of a photographic dealer, and was suddenly brought to a stand by a queer misshapen mass of black timber that seemed to my puzzled eye to be something between a reduced copy of Noah's Ark and the spout used at the east-end wharves for shooting coal. I asked the shopman what new business they were

* This paper, read at the May meeting of the South London Photographic Society, has been in type since that period, but, owing to a pressure of more important matter, it could not appear sooner.

going to launch into, the thought just vaguely flashing through my mind that some expeditious method of vending coal would be a good hit in a west-end greengrocer's store; for in these go-a-head days, when the careful housewife can have half-a-crown's worth of brushes, and the youngest of her household cherubs hit off for 2s. 6d.; when the lords of the creation can have a hat, best Paris make, for 10s. 6d., including portrait inside to prevent any awkward cases of mistaken identity; when at delightful Greenwich you can have tea, including shrimps and correct photograph of the happy party all inside of the (h)arbour; or, when at Epping Forrest, you may have your fortune told and yourself photographed to send to the handsome young lady what's got her weight of gold all awaiting for you; when, if the wind be contrary, and you are choked in consequence by the smoke, you may send for the sweep, who will when you pay him furnish you with his card, when you will learn that he will be most happy to take your portrait (in carbon of course) for 6d.;—when the remembrance of all these mixtures occurred to me, it did not seem impossible that the wholesale dealer might not follow in the steps of the photographic retailer, or rather "headsman," and extend his business in popular photographic ways. The indignant shopman, however, informed me that instrument was for enlarging. I think the solar camera upon the table must strike all present as being at any rate an advance upon the clumsy thing I have described.

The plan mentioned by Mr. Hardwich of putting the negative in a hole in the shutter of a darkened room, and throwing the image through the reversed lens upon a screen, has not been found practicable, except only where a slight enlargement is necessary; for it rarely happened in practice that the light opposite the window is the light of the sky: in nine cases out of ten, on the contrary, the window will command an uninteresting view of a dead brick wall. The only practical means of employing this method is to place a collodion transparence in the shutter, and instead of paper put a collodion plate to receive the image. This will furnish a negative, and from this copies can be taken. When numbers are required this plan, however, will be better carried out by the solar camera.

There are many who dispute Mr. Woodward's right to a patent. I am not of that number, for I hold that the successful application of an old principle to a new science is next door to a new invention; and, if we grant that the principle is akin to the solar microscope, I do not remember to have seen any record of its successful application to photography.* Now, the point of originality in Mr. Woodward's instrument, and one which I hold much more worthy a patent than thousands so called, is the exact placing of the lens at the focal point of the condenser: by this means the rays forming the luminous image travel through the centre of the lens and are parallel. The resulting image is, therefore, wonderfully free from spherical aberration, and, in consequence, gives a picture sharp to the margin. When in the dark room this is clearly seen, for the bright spark on the centre of the lens is seen to be the reduced image of the sun concentrated there. The darkened part of the lens plays no part in the production of the picture, and may therefore be termed the diaphragm, the aperture being just the size of the sun's image.

I have found that the cleanest prints are produced by direct printing; but this plan is frequently very tedious. There are not many days in the year on which we have the uninterrupted beams of the sun for several hours together. It is therefore very annoying to start with sunshine, and then have to wait an hour in consequence of the sudden arrival of an express train of heavy clouds. My favourite plan is to print by development. There is a charm about this plan that far surpasses all the many enchantments of photography. The paper is pinned upon the easel—the sun is turned on, much after the fashion of turning on gas—and, directly afterwards, a dim staining of the paper takes place, which gradually assumes form, and appears, in a few seconds, a ghost-like outline. The paper is taken down, the developing solution poured on, and rapidly spread by means of a strip of Canton cotton, and slowly there arises out of the surface of the paper a distinct image, which goes on filling, shade upon shade, until all the roundness and solidity of life is apparent. I never tire of this part of the process. The rising up of these large images from the blank surface of the paper is so like magic that I feel it fortunate I produce these wonders in the reign of Victoria instead of Elizabeth, for I doubt not I should have been rewarded for my pains by a warm reception.

During the winter months I found that the more bromide I employed, up to a certain point, the more sensitve the paper. The salting solution I then used was prepared as follows:—

Chloride of ammonium	6 grains.
Bromide of potassium	9 ,,
Gelatine	4 ,,
Water	1 ounce.

With paper thus prepared I obtained pictures in three minutes with average sunlight.

The formula which, after many experiments, I think the best, is—

Chloride of magnesium	4½ grains.
Bromide of potassium	7½ ,,
Gelatine	4 ,,
Water	1 ounce.

With this solution No. 1 was produced in three seconds on Towgood's paper. I find that the bromide has a tendency to produce green in the tone of the finished print. On Turner's negative paper the tint is, however, by no means disagreeable. On Towgood's small paper No. 2 shows how important a part the proportions of the salt play in the tone of the picture: the finished print is much warmer. It was produced by the following salting solution on Towgood's small size paper:—

Chloride of ammonium	9 grains.
Bromide of potassium	3 ,,
Water	1 ounce.

The silver for the first picture was sixty grains. The second picture was prepared with the same solution, but a much larger quantity was brushed on. No. 3 is printed on Saxe paper, as also No. 5, but with silver eight grains to the ounce. I find that on Saxe and Rive paper there is a tendency to excess of half-tone, and the paper is extremely rotten in washing.

Chloride of ammonium	9 grains.
Arrowroot	4 ,,
Water	1 ounce.

Sensitised with silver ninety grains to the ounce, and exposed for twenty minutes, it developed very slowly, and, when finished, was by no means over-exposed.

I brush on all my solutions except the hypo. I use several large pieces of thick glass, keeping each for its special use. The salting solution is brushed on and allowed to remain until the paper lies flat, which, with most paper, is in about three minutes. I brush on the silver with Canton cotton, reserving the saturated piece to darken any of the shadows that may need it during development.

When I develop I turn up the edges of the print, so as to form a tray, and pour on a saturated solution of gallic acid, with a few drops of acetic acid: the prints develop cleaner when acetic is used. To wash away the gallic acid I use a large quantity of water. This is absolutely necessary, otherwise stains would be produced which would not be removed by the fixing. The fixing solution is of the usual strength, and does not appear to alter the colour of the print. All the operations except salting must be performed in the dark room.

The negatives are not varnished. It is necessary that they be taken on perfect glass, as the slightest scratch is made painfully apparent in the enlarged picture. The great thing to be guarded against in producing the negatives is to avoid intensity: a good positive picture, with plenty of half-tone, is just the thing. They cannot be too sharp, and certainly not too clean.

I believe I have mentioned all the points I deem of importance, Should I, however, have omitted anything, or not have made myself clear. I shall be glad to answer any questions.

* The author is evidently unaware of the enlarged productions of the Rev. J. B. Reade and others, in the early days of photography, produced by the solar microscope.—S.H.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

THE MECHANICAL AND THE INTELLECTUAL ELEMENTS OF A PICTURE, AND THEIR COMPARATIVE VALUE, BOTH ALONE AND WHEN ASSOCIATED IN A TRUTHFUL PRODUCTION.

"The critic of art ought to keep in view not only the capabilities but the proper objec of art."—*Lessing.*

MY DEAR FELLOW STUDENT,

I am perfectly conscious that by publicly expressing my convictions and opinions without reserve, when abler men with the same reasons for coming forward remain silently in the background, must subject me to the imputation of conceit; but, as I have never yet done so without at the same time setting before you the reason and grounds I have for them, I hope, however you may differ from me, you will perceive that they are not—as an obscure contemporary recently insinuated—the result of that ignorance which, on the faith of my schoolboy copy-book, I, at any rate, believe to be "the *parent* of conceit."

The intrinsic value—or in other words the merit—of an art is properly to be determined by the amount of intellectual excellence, conjointly with the beauty of mechanical execution, displayed in in it. Now photography has, in a very high degree, attained the excellencies of its mechanical element; but the diligent study and incessant practice essential to the proper cultivation of its intellectual element have yet to do their work before the art-science can *publicly, and with universal consent,* take rank with fine arts.

Pictorial art, in each of its departments—Historical, Landscape, Ornamental, Portrait, &c.—in whatever mode executed (outline, light and shade, or colour), you will, I feel assured, agree with me in regarding rather as an intellectual than a mechanical process, notwithstanding that the latter element constitutes the practical execution of the mental design. There are quantities of uninteresting—although neatly, carefully, and laboriously executed—pictures which are failures unworthy the name of art, because they exhibit only the mechanical skill of the correct draughtsman or conventional colourist, without a trace of the intellectual spirit or appreciation of the picturesque which mark the productions of a true

artist. And there are even greater quantities of photographs to which the same description will apply, these constituting what are so frequently denounced as mechanical productions.

But there is, I hold, but one medium through which these combined elements—the mechanical and the intellectual—can attain the very loftiest excellence as pictorial art, this being TRUTHFULNESS.

All the artistic demands of professional critics—all the abstract beauties of breadth, softness, brilliancy, clearness, and other qualities essential to excellence in an artistic point of view—may, and do frequently, exist in works of art, which are nevertheless far from truthful representations of nature. The spectator looking upon such productions is pleased and influenced only in proportion to his amount of practical artistic knowledge; apart from which the things before him are merely painted canvas, chiselled stone, or printers' ink, &c., as the case may be.

On the other side, a picture which has no quality to recommend it but that of pure naturalness, which is a perfectly accurate representation of some locality, and is quite unimpeachable in its truth, may yet claim no higher merit than that of a perfect topographical view—uninteresting, not necessarily from the tameness of the view itself, but entirely from the want of that intellectual element which of itself is capable of investing the most ordinary scene with beauty and interest.

Allowing, then, that I entertain a correct notion of the true object and purpose of a fine art, I assert that a picture may please because of the beauty of its mechanical execution, or because of its display of purely artistic attainments, or because of its naturalness, and yet be in each case very imperfect in its claims as a work of art. To merit the distinction of high excellence in pictorial art, now especially considered in its application to landscape photography, your production should be a truthful representation of the grand or beautiful objects and phenomena of natural scenery, should be so grouped and expressed as to compose a harmonious whole, and should convey vivid ideas of all the sublimity and beauty of the real scene to the mind of the spectator.

Now, as photographers, my dear fellow-student, you and I must remember that the qualities which in camera productions represent the beauty of mechanical execution, is the result of carefully-considered and well-managed chemical agents, the proper use of first-class appliances, and skilful manipulation. This beauty, owing to your long practical experience, and your grateful recognition of the many aiding hands stretched forth to you in our photographic journals and societies, your photographs display in a very high degree. All your friends tell you that these productions of yours are so perfect that your own expressions of dissatisfaction strike them as being very extraordinary; and most of your photographic brethren agree in lauding their mechanical beauty as the loftiest aim of their own ambition; but you, having more elevated ideas of the art's true mission, wish to combine intellectual and artistic with these mechanical excellencies, and I assure you that, as an artist and a photographer, nothing will give me more pleasure than associating myself with you for the attainment of such a very noble end.

I have said that the last-named qualities, however, have their full value only when associated with *truthfulness*. The first consideration, therefore, which meets us on the very threshold of our studies arises from the fact that photographs are not necessarily truthful.

To this therefore I will devote my next epistle; till the appearance of which, I remain, dear fellow student, yours very truly,

ALFRED H. WALL.

Exhibition.

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

[COMMUNICATED.]

(Concluded from page 274.)

MR. THOMAS TYLEY, of Bristol, contributes twelve pictures, which are not generally good in colour: the mural tablets and monuments are not to be critically examined as photographs, that in Henbury Church Yard, Gloucestershire, being the best, but much too decided in tone. The *White Sicilian Marble Monument in Arnos Vale Cemetery, Bristol*, is deficient in depth of focus; and the effect as a picture is spoiled by the want of background—whether of foliage or otherwise—to the urn surmounting it, which, being of white marble, blends too much with the sky, and the outline is consequently lost. Of his architectural subjects, *St. Mary Redcliffe Church, Bristol*, is decidedly the best; but all are flat. *Brislington Church, Somersetshire*, shows a want of artistic perception: the shadows from an adjacent tree, not seen in the view, fall unmeaningly upon the walls of the south aisle, and give an impression of the picture being badly stained. *Winterbourne Church* shows a better selection of point of view, but is still flat. The *View at Brislington, Somersetshire*, wants transparency in the shadows, and *Bristol Cathedral from the South East* is also flat. The *Old Tree, Winterbourne, Gloucestershire*, is the best of Mr. Tyley's productions, though marred by the peculiar colour: the point of view selected is a good one, as also is the subject. The whole are from collodion negatives.

The productions of Messrs. A. H. Wall and Co. are represented only by a small case of *carte de visite* portraits, a photograph coloured in oil by Mr. A. H. Wall, and a plain copy of the same. As a coloured portrait that by Mr. Wall is the gem of the Exhibition: the flesh tints are good, the characteristics of the subject fully maintained, and the photograph strictly adhered to; the only palpable omission—as shown by an inspection of the plain copy—being that a white handkerchief in the breast pocket, but having a tendency to spottiness and thereby detracting from the object itself, has been wisely omitted. The *carte de visite* portraits are good in tone, the whites are pure, and abound in exquisite gradation and detail: they are from bromo-iodised collodion, developed with iron, and intensified with bichloride of mercury and iodine.

Mr. Vernon Heath, of London, contributes fifteen pictures, but not all equally meritorious. *The Cottage Porch* is most sparkling in effect: the whole is arranged in the most artistic manner, even to subsidiaries—the tone and detail throughout good, the shadows thoroughly transparent; but the picture is marred towards the lower angles by a falling off in the capabilities of the lens. The reflected light from the fleshy leaves of the shrubs is well rendered, and the leaves themselves full of half-tone, and not of that sickly white which is the usual impression produced in the camera by so many various angles of reflection: the accidental lights have been well considered, and, as a picture, it is a perfect gem. *The Gardener's Cottage at Endsleigh*, the seat of the Duke of Bedford, is the next in point of quality, but unfortunately a strong breeze has destroyed the otherwise good effect of the foliage. This is not the case with *The Dairy at Endsleigh*, in which the foliage is clear. Both pictures are vignetted with good effect, but in selecting the point of view for the latter Mr. Heath has not exhibited the same good taste as in the others, the dairy buildings being parallel to the plane of the picture, and giving more of a geometrical than perspective elevation. The *View from the Terrace, Endsleigh*, is the most pleasing in its general artistic effect, and the distance is well preserved. Two *Views from the Terrace* and *View from Woodman's Hill, Endsleigh*, are all more or less injured from the effects of the wind upon the foliage; while two views *On the Cornish Bank of the Tamar*, and two in *Daisy Dell*, though all thoroughly artistic are obviously over-developed, and the result is a too decided black and white. One of the views in *Daisy Dell* is also very much marred by the perpendicular trunk of a tree. The *View from Leigh Wood* has rather too much foreground included in the picture, which, being out of focus, produces a disagreeable spotty effect: the distance is well rendered, and the composition artistic. The *Top of Daisy Dell, Endsleigh*, is also a carefully-considered picture, with a fine natural atmospheric effect. *Endsleigh, the Seat of the Duke of Bedford*, is picturesque in its arrangement, but the foliage is blurred; and *Sudbury Church, Derby*, the only really architectural subject Mr. Heath exhibits, is comparatively flat. The wind appears to have been especially spiteful during Mr. Heath's stay at Endsleigh, and the otherwise beautiful productions from that district bear too apparently the impress of this the natural and greatest enemy to out-door photography. The whole are by the collodion process, and show careful manipulation and artistic feeling, having a tendency to represent the delicate refinements of the Art rather than the more vigorous.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE usual ordinary meeting of this Society was held on Wednesday, the 7th inst.,—Joseph Sidebotham, Esq., in the chair.

The CHAIRMAN called attention to the approaching Exhibition in connexion with the British Association, and stated that, judging from the promises the Committee had received, there was every prospect of a great success; but he was desirous of impressing upon the members the aid they could afford by contributing specimens of neglected processes, or of peculiar and exceptional effects. As an example, he alluded to some

pictures which were taken by Mr. Mann, some time since, in which there was a strongly-marked line of light which fringed all the prominent parts of the picture. There had also been exhibited in that room pictures in which a reversed action had taken place, so that a positive by transmitted light was obtained in the camera. Specimens of these and of many similar effects would be most acceptable to the Committee.

The Chairman's allusion to the peculiar effect in Mr. Mann's pictures gave rise to a discussion as to the cause.

Mr. Wardley thought that it would be more likely to arise if the plate were developed in a solution which was kept still, and for the reason that the developed part of the picture was constantly absorbing the silver, which was therefore thus caused to flow from the other parts—the sky, for instance—and that the silver so passing from one place to another became arrested at those points where the precipitation commenced, and gradually built itself outward.

Mr. Young illustrated the preparation of plates 10 by 8 by the hot-water process, as introduced to this Society by Mr. Parry; and he then developed most successfully a negative taken by the same process.

In reply to a question from the Chairman,

Mr. Parry stated that he could not add anything to the description which he had already given of the process. He found that he was at issue on one point with a "Country Parson,"* who laid great stress upon plunging the albumenised plate into the hot water directly it was coated. In his practice he allowed it to drain for a short time, and he believed that to be the better plan. He had lately tried the effect of a neutral silver bath, as compared with another slightly acid, and he had found that the former would not answer unless the plates were used in a few hours after preparation.

Mr. Hebert, in confirmation of this, produced two sets of negatives by the hot-water process—the one being prepared in a neutral and the other in an acid bath. The whole of the plates by the former method were densely fogged; by the latter they were clear and brilliant.

The Chairman asked Mr. Parry if he found the impression fade after exposure if the development were delayed? He had lately developed some plates from Dr. Hill Norris's establishment, which were exposed in Italy, and he found that they gradually became worse, until at last, when he came to the plate that had been kept for the longest period, he could scarcely obtain a trace of the picture.

Mr. Wardley said that he had sometimes thought that there was the same defect in collodio-albumen; but at other times he had met with such success after very long keeping that he could not speak confidently.

Several members who had used Dr. Hill Norris's plates confirmed the statement of the Chairman as to the fading after the exposure; but the unanimous opinion was that they were capable of producing most beautiful results if developed at the right time.

Mr. Offer suggested whether the defect might not be met by over-exposing the plates in proportion to the time which was to elapse before development.

Mr. Hooper said that he had, in waxed-paper, observed the defect spoken of. He had frequently found that as he developed a batch of negatives they appeared gradually to have received less exposure.

The Chairman asked Mr. Wardley if he had ever met with a peculiar yellow stain upon negatives which had been blackened by pyrogallic acid and silver after fixing?

Mr. Wardley had often seen it, and believed that it arose from one of two causes: either the iodide of silver or the hyposulphite of soda had not been completely removed before the second application of the silver. It was far better also, he believed, that a negative should be fixed in yellow light when it was desired to intensify it.

The Chairman said that, in accordance with the idea of reviewing occasionally the contributions of the photographic journals, he begged to call the attention of the members to a description of a stereoscopic camera by Mr. Cramb.† It would be seen at once that it was an inferior copy of the arrangement introduced by Mr. Dancer some years ago.

Mr. Kershaw exhibited a stereoscopic camera of his own construction, which was much admired for its compact arrangement and solidity, although the whole apparatus, including double dark frame and pair of lenses, weighed eighteen ounces only.

The Chairman said that the meeting of the British Association would take place in Manchester at the time appointed for the next meeting of the Society, and it would therefore be necessary to postpone it. At his suggestion it was agreed to do so until the first Wednesday in October.

Votes of thanks were given to Messrs. Young and Parry for their illustrations of the hot-water process, and to the Chairman for his services.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on the 7th inst.,—the President occupying the chair.

The minutes having been read and approved of, Mr. Carter, C.A., was admitted a member of the Society.

There was no regular paper before the Society; but a conversation took place on several topics connected with the art.

In connexion with photographic tours, Mr. Burns said he had recently returned from a short one, during which he had exposed four dozen of plates; and, although it had rained most of the time he was away, he had procured three dozen and ten good negatives of the Trossach scenery and other subjects in that vicinity. The process he employed was the Fothergill one.

Dr. Easton, Mr. Slight, and Mr. Taylor were appointed a committee to arrange a photographic excursion to Aberdour and Inchcolm, for Saturday next, the 17th inst., and most of those members present stated that it was their intention to avail themselves of this excursion, the scenery in that part of the country being very varied, and of a kind highly favourable for photographic pictures.

It was resolved that the next meeting of the Society should be devoted to an exhibition of cameras and other photographic apparatus.

BRADFORD PHOTOGRAPHIC SOCIETY.

This Society's meeting was held on Wednesday evening, the 7th inst.,—Mr. G. H. Leather in the chair.

Mr. Nichols exhibited a few failures by the tannin process, and requested some of the members to explain the cause of them.

The source of these failures having been properly accounted for, a very pleasant conversation then ensued upon the various new dry processes, but more particularly the tannin.

Mr. Abbey and Mr. Beldon stated that they had tried the new dry process by the Rev. L. Sisson, and both had come to the conclusion that it was not as quick by one-eighth of the time as wet collodion.

Mr. Abbey expressed great satisfaction with the tannin process, and stated that he never found the film detach itself from the glass.

Mr. Beldon stated that any good collodion, with scarcely an exception, would do if allowed to set sufficiently before immersion in the bath. He observed that the great fault in this process was a want of intensity in plates which had been kept a few weeks. He mentioned that he had been to Coniston, and exposed a tannin plate to the far-famed Coniston Falls of Mudd, which he says are not known by the above name at Coniston.

This plate was a very good one, with the exception of want of vigour. Mr. Beldon promised to show a few 10 by 8 negatives at the next meeting.

The Chairman said he had worked the modification of the Fothergill process by Mr. Hannaford with great satisfaction. He had prepared the albumen by adding four or five drops of ammoniacal solution of nitrate of silver.

Mr. Sutcliffe observed that he had taken some beautiful negatives in thirty seconds by Dr. Hill Norris's plates, and expressed a wish that this Society should do its utmost to find out a quick dry process.

Mr. Beldon proposed that Mr. Abbey should favour the Society with a paper for next meeting—subject not named.

Mr. Harland seconded the motion, adding, from what he had seen of Mr. Abbey's productions, they should no doubt have a very interesting and useful paper.

Mr. Abbey consented to prepare a paper.

The meeting shortly after adjourned.

Photographic Olla Podrida.

INTRODUCTION TO A BRITISH PUBLIC.

In setting a new side-dish before our readers it will be well to let them know in what way it will be compounded, that they may have a notion whether it will be suited to their palates. Well! an *olla podrida* is a Spanish dish, made up of all kinds of meats and odds and ends—not of sufficient magnitude to allow of their being served up as separate dishes. These are cut up into small pieces and stewed with various kinds of green meat; in fact, a refined "lobscouse," or a Saturday pie with the part of the crust omitted. Of a similar nature will be our photographic *olla:* it will be a hash of little bits of science, little bits of news, little bits of fun; scraps of gossip, literary and artistic; with a sprinkling of jokes—in season—and such a flavouring of spice and pepper as the state of our biliary barometer may dictate.—Hoping to make it such a dish that none will *cut*, but many *come again* to, we subscribe ourselves, Your old acquaintance,

SIMEON HEADSMAN.

The British Association for the Advancement of Science will hold its thirty-first meeting at Manchester in the month of September, under the presidency of William Fairbairn, LL.D., F.R.S. The General Commitee will meet on Wednesday, the 4th of September, at one p.m., for the purpose of transacting the usual business. The sections for Mathematics and Physics, A; Chemistry and Minerology, B; Geology, C; Zoology, Botany, and Physiology, D; Geography and Ethnology, E; Economic Science and Statistics, F; and Mechanical Science, G—will hold their sittings from Thursday to the following Tuesday evening. Lectures and *conversaziones* will be given during the time of the meeting. The reception room will be at the Portico, in Mosley Street. The fees are—for life members, £10 (as a compo-

* See The British Journal of Photography for July 15, page 248.

† See our number for August 1st, page 265.

sition); annual subscribers, £1 (with an admission fee of £1 for new members); and for ladies and associates for this year only, £1.

THE PANORAMIC LENS.—We have lately seen, at Mr. Ross's, one of the best photographs yet produced by this form of lens. It is from a negative, taken by Mr. Sutton, at St. Brelade's, being a view of the church and burial-ground. With the aid of a microscope an inscription on a tomb in the foreground, at twenty feet distance from the point of view, and another at the side of the view, on a slab, at seventy yards' distance, can both be deciphered. To meet the much-vexed question of the term *depth of focus*, Mr. Ross proposes to call this quality *depth of definition* or *pictorial definition*.

EXHIBITION OF 1862.—Three Catalogues are to be issued, viz., an Industrial Catalogue and a Fine Arts Catalogue, for which one shilling each will be charged, and a Descriptive Illustrated Catalogue will be sold at a price determined by its bulk: it is, however, to be printed in super-royal 8vo., so as to range with the exquisite four-volume edition of 1851. Detailed descriptions and illustrations are to be paid for by exhibitors who are disposed to supply such material, but under the sanction of Her Majesty's Commissioners.

A SUGGESTION TO ARTIST-PHOTOGRAPHERS. — Doubtless all photographers who aim at the higher walks of their profession feel animated at the present moment (and no time like *the present)* with an unanimous desire to do honour to the man who has so valiantly claimed for them a position amongst the "*mechanical*" geniuses of the World's Exhibition. We would suggest that their exuberant feelings should find expression and take form in a memorial portrait, wherein M. Silvy should be represented in the recognised garb of an ART-*izan*—not the conventional fez, velvet jacket, baggy breeches, and slippers of the ART-*ist*, but with square brown paper cap, fustian jacket, moleskin trousers, white apron tucked up at the waist, and highlows; with a carpenter's basket, from which camera and tripod peep forth, in one hand, and a pocket handkerchief, with a suspicion of a pudding basin in it, in the other. To keep up the "mechanical" character of the production we would *humbly insist* that the photograph should be "made up" in the card-portrait style at present in vogue at the west end, viz., with an enlarged head, mounted on a very small body. This should be dedicated (with or without permission) to the Lord Chief Baron, who, in his deplorable ignorance of the "men of our times," asked "Who is Silvy?"* As a rebuke to such indifference to an acquaintance with the leaders of the school of *mechanical* photography, and to make the inscription more forcible, let the Irish and Scotch system be adopted; and, as the clans speak of their chief as *The* O'Brallagan, or *The* M'Scratchen, the portrait should be described as *The* Silvy.

Foreign Correspondence.

Paris, August 10th, 1861.

A VERY interesting fact, in a photographic point of view, took place on the 24th of July. On that day M. Auguste Bisson made the ascent of Mont Blanc, and after staying on the summit more than two hours brought away three *clichés*, copies of which will soon be given to the public. I had already spoken to you of the project; but, though I well knew M. Bisson's energy and talent, I had inward misgivings of the success of his attempt, and, in fact, that success was attained at the peril of his life. Bisson started from Chamonix with the guide, Auguste Balmat, and twenty-five bearers; for to carry the baggage to such heights it was necessary that it should be well distributed. A terrible storm of wind, and avalanches falling on every side, obliged the party to come down again from the Petits Mulets to the Grands Mulets. Several of the men felt too ill to proceed: they were sent back, and a halt was made till seven other hardier bearers should arrive from below. As soon as these had come, the ascent was re-commenced, and at length the summit was reached! There the guide, Balmat, and Bisson, whose courage sustained his strength, were the only ones capable of thinking of the reproduction of that magnificent panorama which lay stretched out beneath them. The others, overcome by sleep or exhausted by fatigue and suffering, were unable to move. The photographer and his brave companion set up the tent and prepared the materials; but there was no water, and the fire on which they had counted for melting the snow refused to light in that rarefied atmosphere. Despite these difficulties, three pictures were obtained, of which two especially are very satisfactorily executed. I await further details, which Bisson himself has promised me. The smallest observations made under such exceptional circumstances will possess great interest.

The school of photography for the army is being definitely organised, it appears, at the Val de Grace. The director who is mentioned for this new institution is an amateur who will know how to give to it a serious and useful character.

M. Joseph Balsamo, professor of physical science at Lucca, has communicated to the French Photographic Society a new process which gives, as he believes, more durable pictures than those obtained by the old methods. M. Balsamo immerses his paper for four minutes in a solution of hydrochloric acid, saturated with phosphorus, and diluted with acetate of copper. On being taken from the bath, the sheets are placed one above another in order to thoroughly imbibe the liquid. After five or six hours they are separated, and hung up to dry out of the dust and light. When this paper is exposed in the frame, care must be taken to place blotting-paper underneath so that the moisture disengaged by the influence of the solar rays may be absorbed. The upper side must take a gray tint: the sheet is then withdrawn and submitted to the vapours of sulphuretted hydrogen for five minutes. These vapours attack only those parts which have been acted on by the light. The sheet is then washed in water to free it from the salts of copper, and finally is plunged into a solution of bismuth containing nitric acid. The more diluted the solution is the longer the picture may be allowed to remain, and the more its details will be brought out. M. Balsamo affirms that the pictures obtained by this process are unalterable, as an outer coating of oxide of bismuth is formed, and as there remains little or nothing of chlorine, or of any other matter liable to change.

M. Wothley also announces that he has discovered a printing process without nitrate of silver, chloride of gold, hyposulphite of soda, or carbon powder—a process which gives magnificent and indelible results, with an economy of ninety-five per cent. We should like to have more details.

While new processes of photographic printing are being sought after and published, M. Poitevin's method is making considerable progress in the hands of those who have acquired the right of employing it. An English operator lately made an objection to me which, no doubt, has been also made by others. He said that the necessity of applying a coating of collodion to the carbon image for transferring it must render the process costly. But it is of importance to remark that, as this operation is not performed till after the completion of the picture, it may very well be dispensed with if the result be found to be less perfect than is desired: thus there is but an insignificant loss for the preparations.

Photography has become definitely and officially the auxiliary of justice in France. Not a crime is committed but the portrait of the victim or that of the assassin figures among the documents for the prosecution. Even the place where a crime has been committed is reproduced.

ERNEST LACAN.

New York, July 27th, 1861.

WE photographers, I observe, are lately using a word which is not to be found in the dictionary, and it is a word which seems to suggest a new and wonderful art—*Photo-sculpture!* Is such an art really within our control?

We have always talked about breathing and speaking pictures, but the breath and the speech were only a fiction of the imagination; they were only "subjective phenomena." The stereoscope, however, gives us some physical reality of the marvellous; we do really reproduce solidity. Yet the solidity of the stereograph is to be apprehended by the eye only. Our sense of touch, by which we test the accuracy of the judgments of the eye, says plainly "it's all in yer eye, Betty Martin!"

Photo-sculpture, if there be anything in it, must go a great way beyond; it will give us something more than the shadow or the skin of an object. Here is a good chance for speculators: perhaps some hopeful fellow will dream out how to make another Frankenstein.

I do not make these remarks wholly *apropos* to M. Willeme's photo-sculpture: his plan is altogether too mechanical—requires too much of the clumsy handiwork of man. I introduced the subject rather to show what we are doing here to solve the great problem.

About eighteen months since Mr. Thos. Cummings, of Lancaster, Pa., made a very ingenious experiment, as follows:—

He coated a thin and uniform sheet of gutta percha with a solution of bichromate of potash and gum arabic. After drying, the

* See "Notes of the Month," in THE BRITISH JOURNAL OF PHOTOGRAPHY, page 276.

sensitive sheet was put under a negative and exposed to light. The sheet was then stretched on a frame, and plentifully washed with cold water, in order to dissolve away the unlighted bichromate and gum. So far the experiment was nothing very extraordinary or novel: the next step was the critical and curious climax. To change the flat picture into the boldest relief he pours upon the sheet warm water; the sheet now stretches out, following with considerable accuracy the lights and shades of the picture.

It is to be observed that Mr. Cumming's process will not reproduce the precise form of the model. It will represent the lights and shades by corresponding elevations and depressions, which may be quite unlike the form of the model. Thus we have a new expression and representation of light and shade, and thoroughly new art.

Mr. Cumming's process will no doubt suggest many modifications and improvements, and I look with much hope for its development in Europe. It hardly promises enough of the pecuniary to stimulate our American experimenters.

Photography is already, I believe, used for purposes of police in all the large cities. In New York the "Rogue's Gallery" has been in systematic and successful operation for several years. The gallery is getting to be one of the great shows. Among the recent additions are likenesses of Jeff. Davis, and other notabilities of the Land of Cotton.

Some of our railroad companies require the holders of passes and season tickets to attach their photographic likenesses to the tickets. It would not be strange if this plan should be adopted by theatrical managers.

It has also lately been proposed that prisoners of war, on being released on parole, should leave their photographs, and that photographs of the holders should be attached to passports. The advantages of such a system are readily apparent.

CHARLES A. SEELY.

New Books.

The Tannin Process. By C. Russell.

(London: John W. Davies, 54, Princes Street, Leicester Square. Liverpool: Henry Greenwood, 32, Castle Street.)

Major Russell's Tannin Process has by this time a world-wide reputation—that is to say, so far as the photographic world is concerned. We have already given in these pages, from the author's own pen, some particulars of the general principles of the manipulation; and while some have succeeded to admiration in applying them, others have met with failure and disappointment. This is but the natural consequence of many operators of varying previous knowledge and present intelligence making the essay to put the instructions given to the test of experience; for, while some intuitively, as it were, naturally seize upon the salient principles to be acted upon, others, with far more minute instructions, by adhering too closely to the letter, and being forgetful of the spirit, rush into blunders that by the exercise of the smallest spark of intelligence ought to be to them impossible.

Since the first publication of the Tannin Process in the last edition of Mr. Hardwich's *Manual*, many difficulties have been overcome and failures traced to their source by Major Russell; and we consider that he has acted wisely in placing before the public a record of the result of his labours. In the little book before us will be found a minutely-detailed account of the precautions to be observed, together with the reasons assigned for their recommendation, in order to ensure success: at the same time variations in manipulation are suggested, to suit the peculiarities of different operators, and where any latitude is admissible without detriment it has been carefully pointed out.

Many little ingenious arrangements in what may be regarded as the mechanical part are introduced that deserve especial attention; take, for instance, the following:—

If any loose deposit appear on the surface of the film it may be removed, when quite dry, with a brush made of eider down, which is much less liable to injure the surface than cotton wool or the softest hair brush. Eider down is often to be found in coats, quilts, &c., which are lined or filled with it. To make a brush pick out the largest pieces singly, find in each the small quill by which it was attached to the skin, collect five or six, and form into a small brush by bringing the quills together and twisting this end round between the finger and thumb with a little solution of caoutchouc in turpentine, or other cement. Make a sufficient number of these small brushes to form a round ball of down about the size of a walnut. Bring the cemented ends together and insert in a fowl's quill, which has been cut off near the end and split in two or three places; then bind the quill round firmly with waxed thread. This brush ought not to be often required to remove loose deposit, but is always useful to clear off dust before varnishing, and if applied lightly will do no injury.

The chapter on printing transparencies will, no doubt, be acceptable to many.

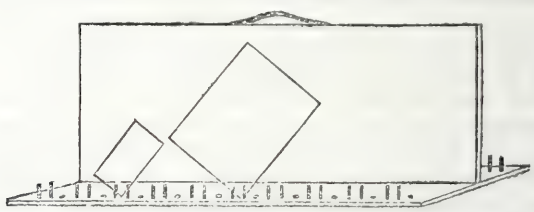
On reading the instructions for preparing the gelatine solution we could not help wondering whether the author had ever tried the use of a small quantity of albumen to clarify it, in the manner adopted by confectioners in rendering a jelly brilliantly clear. In former days we used to have much experience on this point in preparing a medium for mounting microscopic objects, originally suggested by Mr. F. H. Wenham; and as it had to be subsequently submitted to scrutiny under a powerful microscope, the absolute freedom from particles of foreign matter was imperative.

As the method may prove useful to photographers we may as well describe it. The mounting medium to which we have alluded was analogous to that used for printers' inking rollers. The latter, being composed of glue and treacle, is, of course, quite dark in colour and opaque; but the former consists of gelatine and glycerine, which, when perfectly dry, retains a considerable amount of elasticity, and, for its special purpose, must be nearly colourless and perfectly and brilliantly transparent. We used to make it by dissolving one ounce of gelatine in distilled water, first soaking it in the cold water, adding more and more until it refused to absorb any further quantity; heat was then applied, and two fluid ounces of glycerine added, and the solution allowed to become cool; then about a drachm of albumen was stirred in; heat again applied until the mixture began to boil. The vessel was then set aside for about five minutes, to allow the coagulated albumen to settle on the top, and this albumen drew together with it every trace of foreign matter. It then remained only to get rid of the albumen, which was done by pouring the still warm and fluid solution through a perfectly clean flannel bag. It is by no means improbable that this mixture may become a useful photographic agent at some period.

We presume that there are but few followers of dry-plate photography who will not embrace the present opportunity of procuring Major Russell's book; and as an incentive to do so we extract the following instructions

ON CLEANING THE PLATES.

A draining-stand, which will be found very useful throughout this and other dry processes, may be made in the following manner:—Take a thin board, a little more than three feet long and nine inches broad, and nail another board, sixteen inches in width, vertically along the middle of the first. Bore vertical holes, about one and a-half inches



apart, along near the edges of the first or horizontal board: fit a number of wooden pegs about two inches long into these holes, to be used in pairs, in adjacent holes, at such distances as may be required by the size of the glasses used. Nail a leathern strap to serve as a handle on the middle of the upper edge of the vertical board. This stand may be of any convenient size: that described above will take ten stereoscopic plates on each side, set up diagonally on the corners, and is high enough to drain 12 by 10 glasses in the same position.

If the plates have been used before, remove the old films by soaking for a short time in a warm solution of carbonate of soda (common washing soda). The plates should be removed from this liquid as soon as the film will come off easily, or the glass may be corroded. The edges may be detached with a knife or with the finger nail, and the remainder of the film rubbed off with the fingers or a hard brush. Then put the plates into a vessel of water, and, having carried them to a pump or tap, wash in a stream of water, taking care to remove every piece of old film which may remain, and place the glasses on one end, nearly close to the vertical part of the draining-stand, their tops resting against it, the glasses being about half an inch apart. When one row is complete, place the glasses in the next row so that the middle of each covers the interval between two in the first row, that a vent may be left for the escape of damp air upwards. Many dozens of plates may thus be drained at once on the two sides of the stand. Carry the stand into a warm room, and place it before the fire, tilting up one end about six inches to let the water drain away from the lower ends of the glasses. Unless wanted for immediate use, it will not be found worth while to wipe them, if the soda has been well washed off, otherwise this treatment may cause injury by corrosion.

The edges of new glasses should be ground, and, if it be intended to dispense with the use of gelatine, or other preliminary coating, the grinding should extend a little way on to the surface. The neatest way to grind the glass in this manner is with a piece of stout sheet copper, along the middle of which has been soldered a narrow strip of the same metal about one-sixteenth of an inch thick; on the other side a piece of wood may be screwed, to give a better hold. Mix some silver sand, brown sugar, and water, and, with a little of this mixture in the angle, rub the thick copper against the edge of the glass, at the same time grinding the upper surface with the lower edge of the thin strip. The plate is held down with the left hand on a piece of wood or other convenient place, with the edge that is being ground slightly projecting: if it project far, the glass may be broken. The edge and a narrow strip of the surface can in this way be ground without rounding off the angle. The use of the sugar is to render the dirt more easy to wash off. If the plates are to be coated with gelatine it is better to grind only the edges, for the ground glass impedes the flow of the gelatine, and is not in this case required to make the film adhere. The edges should be slightly rounded in grinding, to facilitate picking up the glasses out of a dish.

After being ground the plates must be well washed to remove grit, and drained dry as described above, before being placed in contact with each other. When dry they may be piled one upon another in the place where they are to be cleaned. Any mode of cleaning will answer which ensures the removal of all traces of grease as well as other impurities. The method now to be given is as certain and as little troublesome as any. Two rubbers are required, which are to be constructed as follows:—For the first, take a piece of thick felt, well cleaned with warm water and soda, and then with water only, and, when dry, cement it flat on a bung about three inches in diameter—a solution of shellac in naptha, or of india-rubber in turpentine, will answer as the cement—and the bung should then be laid, felt downwards, on a flat surface, and left with a weight upon it for some hours, after which the edges may be trimmed. Mix a little tripoli with water in a phial; shake up, and allow it to stand a few minutes, that the coarse grains may subside; then well wet the felt with the turbid water, and dry. This rubber will last for years, and will never require anything more to be done to it if kept clean. The other rubber is made by nailing a piece of cotton velvet (cleaned in the same way as the felt) to the edges of a piece of board about four inches wide, and a little longer than the width of the largest glasses to be used. The lower edges of the board should be rounded off, and three thicknesses of coarse flannel laid on it before nailing on the velvet. A

strap of webbing or leather nailed to the edges across the back will make a handle. This rubber, like the other, will last for a long time, as it may be used until the pile is worn off: it will require no cleaning, but may be brushed occasionally with a hard brush kept for this purpose only. Put it away in a dry place, with the velvet downwards, on a clean piece of blotting paper.

Liquids sold for cleaning glasses often contain rouge and nitric acid, both of which are objectionable—the rouge adhering to the glass so firmly as to be difficult to clean off, and a trace of nitric acid sometimes remaining in a scratch causing a mark of insensitiveness in the negative. Old collodion—the older the better—mixed with tripoli, answers well. The collodion should be diluted with an equal quantity of common alcohol, or, what is better, methylated spirit; and if it is not already of a red colour, iodine should be added to bring it to a port-wine tint. A tripoli mixture ought always to be shaken up, and then allowed to subside, that the coarser grains may sink to the bottom: before using, shake till slightly turbid. Choose a place where a slight current of air will carry off the vapour from the eyes, or it may make them smart.

Put the glass to be cleaned in a screw holder, rub the back over slightly with a tuft of cotton wool and a few drops of the cleaning fluid, then wipe dry with a cloth, turn over and fix again with the screw; breathe on the front, and rub with the cotton wool; drop on a little of the mixture and rub over again. When by repeated use the tuft of cotton wool becomes so hard as not to be immediately softened by the liquid, it should be rejected, or the glass may be scratched.

Wipe the edges of the glass with the cloth, to remove free iodine which may have gone over the angles, and would injure the exciting bath; then place the plate against a bottle, in a nearly vertical position, on a piece of clean paper, and proceed in the same manner with the other glasses, except that after the first the collodion need only be dropped on the fronts: a drop or two on each will be quite enough when the cotton is once wet, if the glasses are small. By cleaning the backs slightly we not only avoid introducing impurities into the bath, but prevent waste of the nitrate solution, which, if the glass be at all greasy, will adhere in drops instead of draining off. Next take the plates one by one, place again in the screw holder, face upwards, breathe very slightly on the surface, and polish off the collodion mixture with the felt rubber till quite dry. This will take but a few seconds, and will leave the plate quite clear of everything except slight traces of tripoli dust on the surface, and of the cleaning fluid in the pores of the glass.* The dust should be brushed off with cotton wool, and its entire removal ensured by polishing with the velvet rubber: leather must not be used, as, however carefully cleaned, it always leaves on the glass a trace of greasiness which will repel the gelatine solution. Place each plate as soon as finished, vertically on the draining-stand, and when all have been cleaned, brush the velvet rubber to remove dust.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

WIDE ANGLE OF SUBJECT.

To the EDITOR.

SIR,—I see by last Journal that you have seen some prints taken from negatives by the new American panoramic lens, on, I presume, flat plates.

I shall await your description of them in next number of the Journal with impatience, as I have one made from a formula of Mr. John Brown, of Newcastle-upon-Tyne, that is only 2¼ inches diameter, 12 inches focus, and fully fills out to the edge a 13 by 7 plate clearly defined, with a ⅛th inch stop. Now, this is nearly one fourth more than a usual landscape lens of 19 inches focus will cover; that is, the panoramic lens will include nearly one-fourth more subject than a 3-inch lens of 19 inches focus.

I have had the lens by me nearly two years; but, only using it for 8¼ by 6½-inch plates, did not know its properties till I tried it in a large camera, and found it to fill out a 12 by 9 plate. Having thus. Mr. Editor, put in my claim for an English optician, I must endeavour to prove it by sending you a couple of prints so soon as I can rig up a camera to take a 12 by 9 plate.—I am, yours, &c., THOMAS GULLIVER.

Swansea, August 9th, 1861.

[It is by no means necessary for a lens to be of 19 inches focus to cover a plate of 12 by 10 inches, nor is it usual to employ one of so long focus for the purpose; and, as regards dimensions of the lens, that is only a question of convenience for ensuring moderate *flatness of field* with comparatively large aperture. Our correspondent will perceive that we do not think there is any great gain in the new American lens, judging from the data at present before us. It is not everybody who understands how to ascertain what the focal length of a lens really is; and further, the width of angle included must always depend partly upon the height of the subject, or the corners will be deficient.

We shall be glad to compare Mr. Gulliver's proofs with the American ones, which, we may remark, are only about five or six inches in *diameter*, being quite circular.—ED.]

FAULTY NEGATIVES, &c.

To the EDITOR.

SIR,—Will you kindly tell me the causes of the small transparent spots in the centre of my negative plates. You will see what I mean by looking at the small *black* spots on the bridge in No. 1, and also to the right of the church in No. 2; and in No. 3 the spots are larger, and white instead of black. How can I get rid of the motley sky and comet in No. 4? The negatives are by the Fothergill process. I used Hardwich's bromo-iodised collodion, and well washed the silver off, as I must keep my plates about six weeks. The prints are neither toned nor fixed: I only did a piece of paper over with a brush, thinking you would understand my failures better. I have developed seven plates, and they all have spots on them, but only in the *centre* of the plate. When I fail I like always to find out the cause; please give me your opinion of them. I develop very slowly. Which is the best way to wash the plates thoroughly after exciting? And, lastly, which is the easiest plan to vignette my landscapes of different sizes?

With many thanks for past favours, I am, yours, &c., PHOTO.

[Your spots are not exactly *only* in the centre of your plates; for instance, in No. 1 you have white ones at the left side and black ones in the centre, and the latter would probably be found also on the left side if there were any half-tone there, which there is not. The white spots are due to particles of foreign matters in the collodion, in the form of a pulverulent deposit. These particles, being of greater specific gravity than the fluid, more frequently occupy the centre of the plate, as it is usually there that the collodion is poured on: these particles fall at once down to the bottom of the pool, and are but little disturbed on subsequently tilting the plate; but if large, as in No 1, they will sometimes roll towards the lower edge in pouring off the surplus collodion. Remedy:—filtration of the collodion.

The black spots arise from one of the two following causes, viz.:—the sensitising bath may not have been saturated with iodide of silver, consequently it acts upon the plate by dissolving out minute portions of the generated iodide all over the plate, and the spots become visible only in the half-tones, because in the shadows there is a deposit in developing, and in the high lights the quantity of silver deposit encroaches upon the margins of the holes until they are entirely filled. Or the black spots may arise from fine particles of dirt, &c., in the *washing water* being left on the film; and these protecting the film from the action of the light where they rest, there is no action on the spots during development. In either case the remedy is obvious. With regard to No. 4, we should not advise you to attempt to get rid of the mottled sky, which, but for the comet, is a positive improvement to the picture. If you can dexterously paint in a white cloud over the comet, on the back of your negative, with gamboge, you will do all that is needful. To wash your plates thoroughly after exciting, immerse them in a vertical bath of distilled water until all greasiness has disappeared, then wash freely under a tap having a piece of perfectly clean flannel tied over the mouth of it.

You can readily vignette a subject of any form and size by cutting an aperture in a sheet of thick brown paper, and supporting it at a distance of a few inches above the negative when exposed to diffused light.—ED.]

TONING.

To the EDITOR.

SIR,—When I place my positive prints in the hypo. fixing solution they lose all trace of the purple tone they acquire in the toning bath, and become of a dirty brown colour. They are left in the toning bath until they are slightly over-toned. The hyposulphite solution is made of one ounce hypo. soda to eight ounces water, and is *alkaline*. The prints are left in it about fifteen minutes. Whether I leave them in for a longer or shorter time the result is the same. Is this change of colour due to the hypo. solution being too alkaline or too strong? If you could suggest any means whereby I could *secure* the purple tone, you would greatly oblige, yours &c., X. Y. Z.

Liverpool, 31st July, 1861.

[The change of colour is due to an imperfection in the toning operation. You do not state how your toning bath is made; but we have no doubt that *that* is the part of your process that is in fault. You must remember that the purple tone is not of itself alone an indication of a proper deposit of gold, as the same tint can be obtained by sulphurisation; but the marked change in the bath of hyposulphite of soda is a proof that the gold is imperfectly deposited. Your hyposulphite bath is not at all too strong, rather the reverse. We should advise you to reduce the quantity of water to five, or at most to six, ounces.—ED.]

STEREOGRAPHY.—COLLODION.

To the EDITOR.

SIR,—Your advice on the following is respectfully asked:—

1. Having a stereo. camera, I wish to know if the same movement from right to left is required for all subjects—say a portrait six feet distance, or a building sixty feet. If not, will you inform me how to know the proper distance. In the plate of stand, &c., as used by Mr. John Cramb, *fig.* 1, on page 265 of the Journal, the lenses of stereo. cameras are more apart than mine (one of Horne and Co.'s) can possibly be slid.

2. I have fifteen ounces five drachms of positive collodion, separate solutions; but, wishing to produce negatives only, can I use this successfully, or improve it in any way by another iodiser? If so, what would be the best, and will it do for the tannin process?

August 2nd, 1861. I am, yours, &c., H. P.

[1. The distance between the two stations for a stereoscopic pair of pictures depends upon the question whether you want to produce a *purely natural* or an *exaggerated* effect of distance. If the former, the distance between the stations should equal the width between the eyes; but if the latter, you may increase this distance materially. For distant views the apparent prominence of some objects is increased by taking the stations wide apart; but the effect produced is an exaggerated one—it can have no pretentions to actual truth.

2. You require more pyroxyline and more iodiser in your collodion to fit it for taking negatives. Add two grains of the former and one grain iodide of cadmium to each ounce of your collodion, and it may serve your purpose. It will very likely do for the tannin process as it is.—ED.]

* See remarks at page 59 on the effect of iodide and iodine on silver stains.

LOOSENING OF THE FILM.

To the EDITOR.

SIR,—Having often noticed your willingness to give unfortunate amateurs useful information, I am about to trespass on your kindness.

I have lately been trying the tannin process, and have succeeded as well as I could wish until I come to wash off the developing solution, when the film always parts from the glass, notwithstanding the greatest care. I have tried varnishing the edges, and also rubbing albumen on the glass before coating with collodion: the latter answers very well, but I cannot get an even surface.

If you can give me any information I shall be extremely obliged.

I am, yours, &c., VERDANT GREEN.

[Make your albumen solution *thinner*, thus:—Albumen one ounce, water seven ounces, liquid ammonia ten minims. Having cleaned your plate, take a piece of clean sponge tied to the end of a stick, dip it in the albumen solution and rub it all over the glass, then pour on the albumen in abundance, drain it off closely, and dry it quickly before a brisk fire. You had better procure the book just published by Major Russell.—ED.]

PAUL PRY'S KEY-HOLE PHOTOGRAPHY—WHAT JOURNAL CAN THIS BE?

To the EDITOR.

SIR,—Ha! ha! ha! the idea of that poor body imagining *she* could shut up *me*, PAUL PRY. Wasn't it absurd? Poor Miss Spriggins! Ha! ha! ha!

However, I hope I don't intrude, but I wish to pop in and say that having brought my new process for key-hole photography to perfection, sets of the apparatus may now be procured from all the London and provincial dealers, excepting, only, such as do not keep them. The results of Paul Pry's new key-hole process are WONDERFUL! (please not to omit this last line, as I intend to quote it in large capitals from THE BRITISH JOURNAL OF PHOTOGRAPHY in my advertisements.)

Never shall I forget my first experiments in the above process. I chanced to be in ———: the day was fine Mr. Jabal Leek had ingeniously adapted the whole apparatus to the form of my umbrella: I placed it under my arm, and, eye-glass in hand, I wandered forth.

In a lonely position, like the residence of one who had retired from the world a disappointed and disgusted man, stood a small house: its door being open, hospitably wide open, I went in. Outside the door of one room I heard a wild sarcastic laugh, full of intense bitterness and scorn. The door of that room was evidently between me and the misanthropical Timon who, with his blighted hopes, had found refuge within this solitary house. Presently I heard the scratching sound of a hard-nibbed pen travelling rapidly, as with impetuous haste, over paper, and then, again, sounded that harsh and terrible laugh of malice and exultation.

My curiosity was aroused—I prepared my apparatus in a twinkling—placed my lens before the key-hole—focussed it—put in a plate—exposed it—shut the slide—packed away—and packed off.

When I reached my hotel I was breathless. A closet in my bedroom was my dark chamber. I rushed up the stairs. A girl was on her knees, with a pail, scrubbing: I fell over her and the pail, but the ardour of my feelings was not damped, though the water was very *dirty*. I thought not of catching cold: what soldier dreams of danger when *victory* is in view? Upstairs I rushed, as I said before. It (the image) came out quickly: my process was rapidly developing. Soon the picture was before me. I applied a strong magnifying power, upon which the key-hole became as large as Temple Bar, and there I saw—Oh! triumph! victory! fame! glory! honour! all, *all* were mine—I saw the inside of the room. On the chimney-piece was a glass globe, containing some toy; at a table sat a man, a sinister-looking man, with rough hair, in a sailor's pea-jacket, grasping tightly a pen in his right, and a pair of scissors in his left hand. American journals were at his feet, and a pile of scraps cut from their pages lay beside a paste-pot on his desk. He had been writing on a large sheet of foolscap paper a *Table of Contents*, evidently for some notable photographic periodical. What journal this could be I can't say; but it will, doubtless, be speedily discovered from the following quotations which, wonderful to relate, were distinctly visible to the *naked* (?) eye, when magnified to a sufficient extent. Among the "articles" I found reference made to the following as "Leaders:"—

1. "On the mental superiority of the Editor of this periodical over all other Editors of similar works, whether past, present, or to come, with a few remarks upon the superior mental, moral, and photographic qualities of all subscribers to this periodical."

2. "A few condemnatory remarks, of a purely personal character, on the contributors to other photographic journals, and other laudatory remarks on the great mental, moral, and scientific superiority of contributors to this periodical, whenever there happen to be any, which is seldom, there being rarely genius enough to fit any contribution for these pages."

3. "Soft soap for the soapy and the soft, with a few offensive personalities for those who cannot be thus designated."

4. "On the absurdity of respecting the confidence implied by private written communications to other people, and the honourable nature of publishing on the house-top the contents of the same and the names of their writers."

5. "On a wonderful new lens, invented by the Editor of this periodical, calculated to supersede all other lenses; with some remarks on the wisdom and talent and high moral character of those who have purchased it; and the folly, incompetency, and immoral character of all who refuse to acknowledge its unique perfections."

6. "On the infinite superiority of everything that is the Editor's, whether it be this journal, or his printing, toning, preservative, or developing processes—the pictures he produces—or his last new hobby-horse."

7. "On a sheet of diagrams (representing a wheel-barrow, a razor-strop, a damaged hat, a peculiar pair of spectacles, &c.), illustrative of the one thousand eight hundred and third great invention brought to such wonderful and extraordinary perfection by the Editor of this periodical."

8. "On the new patent fire-irons and fenders manufactured for every kind of fire-place, especially including those to be found in photographic showrooms, as recently introduced by the celebrated Puff, Esq., and sold by the inventor, &c., with a copy from an engraving (originally executed for the advertisements), and all the matter contained in the circular issued from the manufacturers."

9. "On our advertisers—their good sense and taste in selecting our periodical as a channel of publicity; with a few personal remarks on the foolish, stupid, and immoral wretches who don't do so."

Without, however, increasing the number of these quotations, I hope I have given enough to indicate the periodical to which they belong, and as I am particularly curious to learn its title and where it is published, if anywhere, will any one who discovers the same address a line, with a stamped envelope for the acknowledgement of its receipt, to

Yours, very truly, PAUL PRY, P.P.K.H.P

Kew Rye House, August 4, 1861.

ANSWERS TO CORRESPONDENTS.

O.—In an early number.

S. P.—We do not like kaolin for the purpose; it is very wasteful.

LIGHTBODY.—We believe that the attempt has been abandoned for the present.

SUCKLING, BUT NO BABE.—Perhaps you will find Mr. Hockin's book answer your purpose.

WIDE-AWAKE.—Your are the fifth correspondent who has made a similar comment. Mad!—stark mad!

S. E. E.—We have long had it in contemplation; but we have never had the requisite leisure. We still hope to do so.

R. P.—We cannot recommend sel d'or as a toning agent, beautiful as some prints toned by its aid undoubtedly are.

SIMON G.—Declined with thanks: it is too personal for our columns. We do not mind a joke, but cannot admit a coarse accusation.

R. EATON.—If your dark slides are stiff from damp, put them in a box with a closely-fitting lid, and at the same time put in a lump of *unslacked lime*.

SIMPLE JOHN.—You have omitted to restore the nitrate of silver that was removed prior to the application of the preservative: add a few drops to your developer.

OPEN AIR.—Mr. Rouch's tent is very good, so is Smartt's; you had better inspect both. For us to decide which will suit your requirements best without further information from yourself would not be very easy.

F. R.—Ammonio nitrate of silver solution is unfit for exciting albumenised paper; you can use it, however, by neutralising the ammonia with nitric acid, oxide of silver being soluble in nitrate of ammonia. See Hardwich's *Manual*.

F. BARNES.—Vignetting, if tastefully executed, adds much to the artistic value of some portraits and views; but it is quite a mistake to apply it to stereographs in which you require a marked limit in order to give the idea of distance more perfectly.

POOR PRINTER.—Add a *little* acetic or nitric acid to your paper sensitising bath when you have to prepare many sheets in hot weather, and you will find it will preserve them from becoming brown for a longer time, though they will perhaps become impressed rather more slowly.

J. H. SLATER.—You will find the portrait lens which you mention quite fit for the large-sized plate, 10 by 8, provided you do not use an aperture of more than two inches diameter, and at least four times as rapid in action as the single lens with a diaphragm having $\frac{7}{8}$ inch aperture.

C. B.—It is no doubt the paper that is in fault this time: you will find, on holding it up to the light, a minute black speck in the centre of each white one, the black speck being a particle of metal. It is highly probable that the whole batch of paper made at the same time is defective in the same way; but fortunately this can be seen as well before as after bestowing your labour on it, by examining each sheet in front of a strong light.

OPERATOR.—If you are no chemist you must, to some extent, work by "rule of thumb." Of the several makes of collodion which you name as having tried, work with No. 2 on your list, while freshly iodised; when it gets slow use No. 5 in the same bath. In time you will find your proofs fog a little; then mix No. 2 and No. 5 together, using only enough of the old No. 2 to give you proofs that are not fogged. No. 1 we do not know. Nos. 3 and 4 we do not think equal to those we have previously indicated.

WM. LYNE.—On holding your proof up to the light, so as to look *through* it, the mottled appearance in the sky is seen, indicating photographic measles. This extends all over the picture; but is not so perceptible in the darker parts. It may arise from either of the following causes, viz.:—1. The free nitrate of silver not having been removed.—2. A free acid being present.—3. Too weak a solution of hyposulphite of soda, or, what amounts to the same thing, the proof being put wet into a solution strong enough, but allowed to remain at rest. The brown spots are due to decomposed hyposulphite of silver. See Mr. Dawson's papers in former numbers of this Journal.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 149, Vol. VIII.—SEPTEMBER 2, 1861.

Photography at the International Exhibition.—When a statesman of acknowledged reputation is sent for to construct a cabinet, his first consideration, before accepting the trust, is whether he has any chance of carrying such measures as his party may consider it imperative upon them to propose; and if he arrive at the conclusion that his power is insufficient, he prudently declines the task proposed to be assigned to him. We cannot forbear expressing our conviction that the Council of the Photographic Society has acted like the prudent prime minister *in posse* by declining to nominate a committee to assist the Royal Commissioners in insulting the followers of our art. It must be evident to everyone that, had the Council of the Photographic Society accepted the responsibility of nominating a committee while the objectionable classification of photographs is persisted in, it would therein have accepted also the odium of branding the art which it is bound to uphold as a mere matter of mechanical dexterity. As there are many of our readers who do not see the *Journal of the Photographic Society*, we extract therefrom the two letters which close the correspondence:—

Offices, 454, *West Strand, London, W.C., July* 29, 1861.

Sir,—Adverting to your letter of the 12th of June, I am directed by Her Majesty's Commissioners to inquire whether the Council of the Photographic Society are yet able to favour them with a definite reply as to the nomination of a Committee in connexion with Class 14. The Commissioners will be glad if the matter could be settled in the course of the current week, in order that they may conclude their arrangements in connexion with this department of the Exhibition.—I have the honour to be, Sir, your obedient Servant, F. R. SANDFORD, *Secretary.*

To Hugh W. Diamond, Esq., M.D.

Photographhic Society, July 30, 1861.

Sir,—In reply to your communication of yesterday's date, I have to inform you that I do not think that the Council of the Photographic Society could come to any decision in the absence of the President, who is now on Circuit. I have forwarded him by this post a copy of your letter, and I will immediately act on any instructions which I may receive from him.—I have the honour to be, your obedient Servant,

To F. R. Sandford, Esq. HUGH W. DIAMOND, *Secretary.*

To the preceding letter the following, unanimously adopted at a special Council meeting, the President, Right Hon. Sir F. Pollock, being in the chair, was forwarded, viz.:—

Photographic Society, August 8, 1861.

Sir,—The Council have no wish to dictate to the Commissioners in what form their just expectations shall be fulfilled. If the Commissioners are prepared to receive photography as a branch of the fine arts, the Council are willing to appoint a Committee and afford every assistance in their power.

But, if this be not conceded, the Council cannot concur in any proceeding the tendency of which is to disparage photography as one of the now universally-acknowledged means by which genius can perpetuate whatever is grand and beautiful in nature.—I am, Sir, your obedient Servant,

To F. R. Sandford, Esq. HUGH W. DIAMOND, M.D., *Sec.*

Our worthy friend and brother editor is very reasonably astonished at the disingenuous letter from Mr. Sandford, and, commenting thereon, very truly remarks:—"We think that some reference ought at least to have been made to the question in dispute, if only to say that it was impossible to accede to the desires of the body of photographers who have unanimously expressed themselves as being aggrieved." Truly we think so too. But there is one point especially to which we would solicit the attention of our readers, which is, that, by abstaining from nominating a Committee to sanction that over which it could have no control, the Council of the Photographic Society inflicts no injury, either actual or imaginary, upon any one of its members; for it does not impede any of them who may elect to do so from accepting the invitation of the Royal Commissioners, while a contrary course would have had the effect of branding photographers as mere craftsmen by a body supposed to be the special exponent of photographers' own sentiments. Our French compeers rightly remarked that of course the Photographic Society has the option of declining the invitation, and we rejoice greatly to perceive that, as a Society, it has declined it. The next move requires a little deliberation.

It is with much pleasure that we notice in the last number of the Society's Journal an able letter from the pen of that veteran artist-photographer, M. A. Claudet, that well merits perusal. We are glad to find—as indeed we should have anticipated—that his views are in perfect accordance with those we have all along advocated; and we rejoice the more that he has thus written on account of the misapprehension supposed to exist amongst the majority of our French brethren. Happily there is no need to inquire Who is Claudet? as was the case with a would-be magnate.

Since writing the preceding we have heard a rumour that the Royal Commissioners intend themselves nominating a Committee to manage (we had almost written mis-manage) the photographic collection expected, and will then inquire of the Council of the Photographic Society whether it will suggest the addition of any names to those selected. If this should prove to be the case, it will be truly an insult in the form of a courtesy; but we have every confidence in the judgment of those gentlemen who have hitherto acted with so much discretion in this provoking contest, and have no doubt they will finally adopt the course best calculated to promote the dignity and interest of photographers.

Photo-Lithography.—In the early part of July we were favoured by Mr. Ramage, of Edinburgh, with some very fine specimens of photo-lithography—certainly as fine as, if not finer than, anything we had hitherto seen of the same class. We are informed by Mr. Ramage that, while his method of operation is based upon those of Mr. Osborne, of Australia, and Colonel Sir Henry James, he has introduced certain novel features to which, no doubt, his pre-eminent success is in some degree attributable. In what his improvements consist he is not yet prepared to make public, inasmuch as he is still prosecuting his researches with a view to making further advances. At present the process is limited to the reproduction of engravings or other originals, the shading of which consists of lines or dots—in other words, not dependent upon half-tone, properly so called, as in photographs of natural objects: in this respect it in no way differs from those of his predecessors. That which has struck us most in viewing the specimens before us is their exceeding delicacy, combined with brilliancy of effect. They

consist of some half-dozen reduced copies of engravings from pictures in the Vernon Gallery, with which many of our readers are no doubt familiar, and we do not consider that they have suffered in the smallest degree from the reproduction. One noticeable peculiarity in those before us is that they are printed upon a species of plate-paper covered on the surface with a calcareous-looking enamel, similar to that used on visiting cards, except that it is not glazed. This imparts a brilliancy to the lights without there being any offensive glare. There is another feature that we notice: the density of the negatives must have been considerable, judging from the purity of the lights, though the lines are perfectly sharp and clear, without the slightest encroachment thereon of the denser parts. Mr. Ramage had an idea that his method of operation would be especially applicable to the delineation of microscopic subjects; and no doubt it would, but not exactly in the way in which he imagined, for two reasons, viz.:—

Firstly.—The greater number of microscopical objects are not *altogether* composed of minute lines, though many of them owe much of their ornamentation to the elegant arrangement of innumerable dots and lines on a surface more or less curved, which in delineation requires the most delicate shading to give it due effect; and supposing these to be both achieved in the negative (a feat of no little difficulty), we fear that the shading would not be transferable to the stone.

Secondly.—Those objects that are adorned with the most delicate *striæ* and other markings require for their definition a lens of an angular aperture undreamed of in ordinary photography, and which necessarily limits the plane of definition so rigorously to a fixed spot that a movement in distance from the lens of less than the five hundreth part of an inch is sufficient to throw it completely out of focus; consequently it is only by carefully focussing up and down that the whole surface of an object only very slightly curved can be properly viewed, much less photographed, the various parts coming successively into view. For this reason we think there is at present no chance of applying photography to the *direct* delineation of microscopic subjects generally. Carefully-executed drawings might, however, be made as at present is the case, and these might be multiplied by Mr. Ramage's plan advantageously. One of our most eminent delineators of microscopic objects, Mr. Tuffen West, draws from nature upon the stone direct, and uses, we believe, a fine diamond point for some portions of his work; but there are some other professionals in this branch of art who cannot or do not draw upon the stone, as also many amateurs whose microscopic drawings are marvels of graphic skill, and these have either to remain as monographs or be copied by engravers or other professional draughtsmen, not only at great expense both of time and money, but frequently not without loss of some of the delicacy of the original drawing. For these Mr. Ramage's process will be pre-eminently valuable.

We have remarked that *at present* we perceive no chance of the direct application of photo-lithography to general microscopic delineation; but we by no means despair of the difficulties pointed out being eventually overcome, possibly by the judicious application of some kind of artificial illumination rich in the photogenic rays, and which by their persistence for some time may be sufficient to impress the sensitive film, though not sufficient to excite the optic nerve, even with a materially-reduced aperture of the lens. But, as the discussion of this point would be at present premature, we shall not push the argument further. It would, however, be a fine field for research to the photographic chemist to endeavour to ascertain the most active kind of artificial illumination as regards actinic rays.

TEST-PICTURES.—We have very recently received two or three specimen proofs from negatives that demand notice at our hands in consequence of their possessing some rather interesting features. The first is a group of between seventy and eighty persons, male and female, consisting of a party of Irish emigrants surrounding their father confessor. The negative is on a 10 by 8 in. plate, and was taken by a Dublin photographer with one of Mr. Grubb's "C" view lenses, with an exposure of only eight seconds. Some two or three of the sitters have moved during the exposure, short as it was; but the majority are all well defined and beautifully distinct, the whole affording ample testimony to the excellence of the instrument with which the negative was taken, as well as to the manipulative skill of the operator. We are informed that a copy of this subject is to be seen at the establishment of Mr. Solomon, in Red Lion Square, London. Two other specimens are test-pictures intended to show what amount of distortion is given by one of the same maker's "C" portrait combinations, and we are bound to add that, though the tests applied have been pretty severe, no appreciable amount of distortion is discernible. One is a copy (of nearly equal size) of page v. of the advertisement sheet of this *Journal* for the 1st ult.; and, although the letters in the extreme corners are just a trifle out of focus, they are without exception perfectly legible, and save in the extreme corners beautifully "sharp." The negative was taken with an aperture of two inches diameter. The other is a copy of several of our advertisement pages from our June, July, and August numbers (including the one previously mentioned), placed upon a paper ruled in squares, and reduced to one-fifth the original size, an aperture of one inch being employed. Here again there is no distortion whatever perceptible; and with the exception of the letters in two only of the extreme corners, which are a little out of focus, being slightly indistinct, the entire field is well defined. We learn that duplicate copies of these proofs have been sent for public inspection to Messrs. Negretti and Zambra's, Regent Street, and to Mr. Solomon's, Red Lion Square.

ON CLEANING GLASS PLATES.

By GEORGE DAWSON.

IN THE BRITISH JOURNAL OF PHOTOGRAPHY, of the 15th August (which, from my peripatetic propensities, has only just come to hand), is published an extract, on "cleaning the plates," from Major Russell's recent work on the "Tannin Process." In order that its readers may not have the pleasure of enjoying disappointment from adhering too closely to his instructions, I hasten to warn them that his mode of washing is liable to a fatal objection. This I have learnt from long experience, but was able to trace the error to its source. He says:—

"If the plates have been used before, remove the old films by soaking for a short time in a warm solution of carbonate of soda (common washing soda). The plates should be removed from this liquid as soon as the film will come off easily, or the glass may be corroded. The edges may be detached with a knife or with the finger nail, and the remainder of the film rubbed off with the fingers or a hard brush. Then put the plates into a vessel of water, and, having carried them to a pump or tap, wash in a stream of water, taking care to remove every piece of old film which may remain, and place the glasses on one end, nearly close to the vertical part of the draining-stand, their tops resting against it, the glasses being about half an inch apart. When one row is complete, place the glasses in the next row so that the middle of each covers the interval between two in the first row, that a vent may be left for the escape of damp air upwards. Many dozens of plates may thus be drained at once on the two sides of the stand. Carry the stand into a warm room, and place it before the fire, tilting up one end about six inches to let the water drain away from the lower ends of the glasses. Unless wanted for immediate use, it will not be found worth while to wipe them, if the soda has been well washed off, otherwise this treatment may cause injury by corrosion."

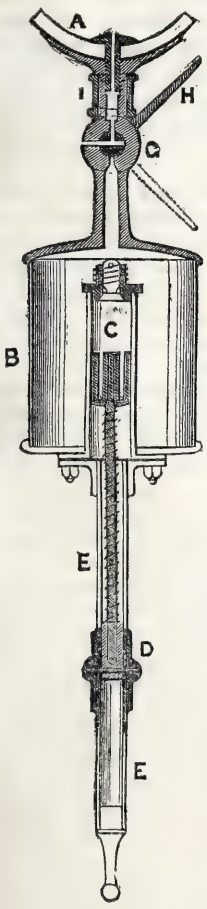
This would be a correct enough method of cleaning the plates provided the whole treatment after the soda were conducted with rain or other soft water. Under these circumstances a plate might be safely left to drain and dry spontaneously as Major Russell suggests. But when the final washing is made with the deep well water of London, and other lime districts, it is necessary, and curiously enough still more so with the London surface wells, to wipe the plate thoroughly dry before evaporation has proceeded so far as to deposit a thin crust of carbonate or sulphate of lime on the surface of the glass. All waters which are technically called "*hard*" will invariably, if left to dry spontaneously on a glass plate, cause the deposition of one or the other, or both, of these salts on its surface; nor can

they be got rid of by any amount of soft-leather rubbing and polishing. The result in the finished negative is invariably a picture of unequal development—in fact, a failure. The carbonate of lime can easily be removed by treating the plate with dilute nitric or sulphuric acid; but, should this fail in removing the film, the deposit is most probably sulphate of lime. In this latter case the plate is practically useless, and should be destroyed or sold to some enthusiastic amateur who has never known failure, to enable him to grapple with difficulties.

Closely allied to this cause of failure in cleaning old plates, I may mention another which I am sure has caused to many, as it has often done to me, great disappointment. This arises from a too frequent habit of leaving plates to soak for some time in an open dish of *hard water*. In this case as the water evaporates the lime salts must infallibly be deposited on the surface of the glasses, producing results even more marked than when after a short washing they are left to dry spontaneously in a warm room.

I would recommend, therefore, that when previously used, and varnished glasses have to be cleaned, they should be soaked in rain or other soft water, and when dried according to Major Russell's plan the last water should always be of the same character.

NOTON'S VACUUM PLATE-HOLDER.



Referring to the description of the above apparatus, given in No. 138 of The British Journal of Photography, page 105, it is thought that the addition of a sectional drawing would not be unacceptable in further explanation of the internal construction of this convenient instrument.

The general appearance will at once be seen from the outline; then continuing the description previously given—

A, is the India-rubber disc, fastened, as usual, by the hollow screw.

B, the enlarged cylinder or vacuum store.

C, the air-pump. The piston-rod is continued to the ferrule D, which slides on the tube or stem E: the connexion between the mounting on the end of the piston-rod and ferrule is made by a pin passing through both—a slot being cut, on each side of the tube, the length of the stroke of the piston.

The valves of the air-pump being inverted, light spiral springs are attached, to rather over counteract gravity.

G, two-way cock, moved by the lever H. As drawn, the plate-holder is ready to receive a plate, a vacuum being supposed to be in the cylinder B.

By moving the lever H downwards, as shown by the dotted lines, the plate will be fixed instantly, or it may be as quickly released by turning the lever up as at first.

I, a loose ferrule to reduce friction when whirling a plate. In future, another one will be put at the bottom end of the tube E, instead of as here shown.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

ETHER.

Synonymes.—Sulphuric ether, oxide of ethyle, hydrate of etherine.
Composition.—$C_4 H_5 O$ or $(C_4 H_4 + HO.)$
Equivalent.—37.

Preparation.—The daguerreotype, calotype, and waxed-paper processes having become almost superseded by the various collodion processes, wet and dry, ether, as the solvent for pyroxyline in collodion, is now the *sine qua non* of the photographer. The methods followed in its preparation are numerous, some of them being quite obsolete, while others are adapted only to its manufacture on the large scale. The materials employed, however, are the same in all cases, though the proportions and the method of treatment vary. We shall describe only that process which experience has proved to be the best, prefacing the description, however, with one or two introductory statements which it is conceived will make the matter more intelligible to the non-chemical reader. If, by reference to our previous paper on alcohol, a comparison be instituted between the composition given for that substance and the one given above for ether, it will be found that the former differs from the latter in the possession of one atom or equivalent more water, thus:—

Alcohol $C_4 H_5 O + HO.$
Ether $C_4 H_5 O.$

The preparation of ether, therefore, involves the removal of this atom of water by means of some substance possessing sufficient chemical energy to overcome its affinity for the ether. Sulphuric acid or *oil of vitriol* presents itself as having the necessary qualities, and it is accordingly employed with great advantage in the following proportions:—

Concentrated sulphuric acid 8 parts by weight.
Alcohol, sp. gravity ·834 5 „ „ „

These are introduced into a flask, the neck of which is closed with a tightly-fitting cork, in which three holes have been bored—one of which is destined to receive a thermometer with graduations on the stem, another a bent tube of comparatively large diameter, and connected with a condenser, while the third is fitted with a tube funnel communicating with a reservoir of alcohol. The arrangement of the apparatus being completed, and the joints secured with a suitable luting of linseed meal or almond paste, heat is applied until the contents of the flask acquire a temperature not higher than 300° Fah. or below 260°, as indicated by the thermometer; and, indeed, the main precaution to be observed in conducting the operation consists in the maintenance of a steady temperature at or about 300°, and of rapid, or even violent ebullition—the reason for this being that the limits of the ether-producing temperature are between 260° and 310°. It is found, also, that if more sulphuric acid be used, so as to cause the temperature to rise above 320° olefiant gas, and variable quantities of other products are found—and if, on the other hand, by the employment of a weaker acid or too much alcohol the temperature be suffered to fall below 260°—little else than unchanged alcohol distils over. These precautions, however, being attended to, all the alcohol which is supplied to the flask both in the original mixture and by continuous dropping from the reservoir, is successfully converted into ether and water, the mixed vapours of which distil over and are collected after condensation in the receiver, where they spontaneously separate into two strata, the ether floating on the water. The crude product so obtained invariably contains alcohol, from which it may be separated by being shaken with about twice its bulk of water, which retains the alcohol and allows the ether to float on its surface. As, however, ether will take up one-ninth part of its bulk of water, this requires to be separated; and this may be accomplished by agitating the ether with some well-burnt quicklime and distilling therefrom, care being taken to prevent all escape of vapour, and to effect its complete condensation by keeping the receivers cool. The first third which distils over may be regarded as pure ether. It not unfrequently happens that the separation into two strata above referred to does not take place, owing to a larger amount of alcohol than usual having distilled over, in which case it will be found that the addition of a little water causes the separation required.

Physical Characters or Properties.—Pure ether, prepared as above directed, is a colourless, transparent, very light, and limpid liquid, having a peculiar and fragrant odour, and a warm, pungent taste, afterwards feeling cool. Its specific gravity varies from ·712 to ·720 at 60° Fah. It is extremely volatile, and the density of its vapour is high, being 2·586, and highly inflammable; great care should therefore be exercised in manipulating with collodion near a naked flame. Its vapour, when inhaled, produces an amount of exhilaration approaching almost to intoxication, and, when judiciously administered, produces insensibility to pain during surgical operations. It boils at 96° Fah., and has been frozen at 47° below zero, becoming a white crystalline mass.

It is a good solvent for resins, volatile and fixed oils, caoutchouc, several vegeto-alkalis, and some neutral crystalline principles. Inorganic salts, however, being generally insoluble in this menstruum, are frequently precipitated in small crystalline grains, when their alcohic solutions are added to ethereal solution of pyroxyline, *i.e.*, collodion.

Briefly stated, the above may be regarded as the more ordinary and well-known properties of ether. Its extensive employment, however, in the manufacture of collodion has led to a more careful consideration of its properties, resulting in the discovery of some

interesting facts, which, on account of their importance to the photographer, demand a separate consideration.

Foremost among these must be mentioned its tendency to become acid and *ozonised* by exposure to the joint action of air and light. The effect of these subtle agents is to cause the formation of acetic ether, and to confer upon the ether the power of liberating iodine from those substances which are employed in iodising collodion. It was at first supposed that iodine was set free in iodised collodion through the presence of slight traces of acid in the pyroxyline, or through the formation of peroxide of nitrogen by its decomposition; but experiment has shown that *ether alone* acquires this property through the combined action of air and light, causing the formation of a peculiar substance resembling *ozone*, which is described by chemists as allotropic oxygen, or oxygen in an active condition.

The acquisition of these undesirable properties by ether may be almost completely prevented by keeping it, or collodion prepared with it, in well-stoppered bottles, which should be placed in *cool, dark* cellars.

It occurs to the writer that the foregoing facts may, perhaps, lead to the conclusion that the amount of free iodine produced in a given sample of collodion in a given time would indicate the degree of acidification or ozonisation which the ether had undergone. It may be admitted that, to a certain extent, this inference would be a correct one; but, in making it, due consideration should be given to the iodides employed in the collodion—these bodies possessing very different degrees of stability, iodide of ammonium being the least, and iodide of cadmium the most stable.

In the earlier days of collodion manufacture, it was considered that as ether was used only as a solvent for pyroxyline, and did not necessarily undergo any chemical change, that those portions forming sediments or residues, and indeed any old collodion, might be redistilled and the ether so produced utilised in the preparation of new collodion. Subsequent experience has, however, satisfactorily shown, that it is inexpedient to do this—that it is indeed false economy—as the collodion prepared in this way acquired so soon the property of decomposing the iodides used in sensitising it that it speedily becomes unfit for employment in any process where even a small degree of sensibility is required, and suitable only for copying engravings and subjects of a kindred character.

Impurities and Tests.—Among the first may be mentioned water, alcohol, oil of wine, aldebyde, and methylic ether. Faint traces of lime are also sometimes carried over mechanically in the process of rectification. The first of these, arising generally from imperfect rectification, may be separated by redistillation from quick-lime by the heat of a water-bath. In speaking of the second, however, as an impurity, it should be understood to be so only in the strictest acceptation of the term, for, in point of fact, ether without the addition of alcohol is unfit for the manufacture of collodion; but as it is desirable to be able to control the amount of the ingredient, and as this can only be attained by the employment of ether absolutely free from alcohol in the first instance, it is obviously necessary that the ether sold for photographic purposes should *be* ether *per se.* The third impurity mentioned, namely, oil of wine, is not likely to be of frequent occurrence in the ether sold for photographic purposes, though it is sometimes contained in the crude product through allowing the temperature to rise too high: evidence of its presence will be afforded by its rather unpleasant smell when a portion of the suspected ether is allowed to evaporate on the hand. It may be separated from the ether by redistillation from caustic alkali. Aldebyde is a product of the oxidation of alcohol which may perhaps be sometimes contained in ether, in which case it would cause its deterioration by passing into acetic acid and by this means rendering the collodion prepared with it very insensitive.

Methylic ether would be produced by the employment of methylated spirit in the preparation of the ether. Evidence of its presence may be obtained by allowing a portion to evaporate in the hand, when, if present, a naptha-like odour will be perceived. The chief objection to its presence arises from its proneness to absorb oxygen from the air, and render the ether acid from the formation of formic acid.

It also has the property of bleaching iodised collodion by entering into combination with any iodine that may have become liberated: it is doubtful, however, if the sensitiveness be thereby increased.

The traces of lime mechanically projected into the ether in the process of rectification would be indicated by the production of a white precipitate on the addition of oxalate of ammonia, and may be removed by agitating the ether with sulphuric acid and redistillation.

In concluding this division of the subject it may be remarked that the specific gravity of good standard ether should be ·720° at 60° Fah., and any variation from these may be regarded as an indication of one or both of the two first-named impurities. The following also may be regarded as a good indication of the presence of alcohol. Pyroxyline is somewhat difficultly soluble in *pure* ether: if this substance, however, contain only a small proportion of alcohol, the pyroxyline enters into solution with great readiness.

Effect of Internal Use.—A large dose of liquid ether or its vapour produces profound lethargy, with slow, deep, and noisy breathing; the skin becomes pale and cold, and the eyes glassy, while the muscles generally are flabby and relaxed.

Antidote.—Artificial respiration should be resorted to, abundance of fresh air allowed to come to the patient, and cold water sprinkled on the face. Should the case, however, present unusual difficulties, medical aid should be called in.

THE POLYCONOGRAPH,

A new Camera for taking many Landscapes, &c., on One Large Plate,

Invented by M. J. Duboscq.

For the following description of this new piece of apparatus we are indebted to the pages of our contemporary, *Cosmos.* M. Jules Duboscq, who has already rendered considerable service to photography, has just invented a piece of apparatus specially intended for obtaining a considerable number of views during a journey, and has therefore designated it as the travelling Polyconograph. This apparatus consists of three parts—the camera, the plate-holder, and the tripod.

The *camera* consists of a kind of telescope formed by two metal cones united by a short piece of tube, the cones being placed with their bases towards one another. At the base of one of the two cones is a piece of ground-glass, and at its apex a convex lens serving as an eye-lens wherewith to view the image formed on the ground-glass. At the apex of the other cone is a double combination achromatic lens. When in use this apparatus is fixed to the plate-holder attached to the tripod.

The *plate-holder* is somewhat complex in construction, consisting of a dark box in which a sensitive dry plate of large dimensions is deposited, the box itself being very shallow, and furnished on the front side with a system of five double sliding shutters, disposed one over the other, and sliding out from opposite ends of the plate-holder, so that by the partial sliding out of the two composing any one pair of shutters a portion of the plate is exposed to the action of the light. Each shutter protects a portion of the plate intended for three landscapes (or other subjects) side by side; and, as there are five systems of shutters over one another, the plate will receive in all fifteen subjects. At one end of each of the outer slides of the plate-holder is an aperture and fitting furnished with a bayonet joint in order to receive the cone which carries the object-glass.

The *tripod* has on two of the legs buttons or pegs to support the plate-holder, which, instead of being placed as usual on the top of the tripod, is supported against these pegs and kept in its place by means of a brass arm which is held by a screw on the top of the tripod—an arrangement calculated to impart considerable steadiness to the whole apparatus.

To operate we proceed as follows:—The plate-holder being fixed in position on the tripod, and the lenses attached thereto on the top, the whole is arranged opposite to the view or other subject to be delineated, and, looking through the eye-lens, the focus is carefully adjusted. The cone carrying the object-glass is then detached from its position by unloosing the bayonet joint, and is placed in the aperture of the upper slide, into which it fits in like manner. The inner shutter is then slid out sufficiently to expose that portion of the plate opposite to the objective, and the cap of the lens is removed for a sufficient time. The sensitive plate and the ground-glass in the tube where the focussing is effected are so arranged that when one is in focus the other also must be so; if, therefore, more copies than one of the same view are desired, there is no need to focus again; but, by simply shifting the slides one space further, another exposure may be effected, and consequently another negative obtained, with scarcely any trouble. Each of the slides is divided into spaces and numbered successively, and the plate-holder is divided internally into fifteen divisions. The plate-holder can be carried as a knapsack, the lens in the pocket, and the tripod can be used as a walking-staff.

THE CONSTITUTION OF THE SOLAR ATMOSPHERE AS REVEALED BY SPECTRUM ANALYSIS.

By Samuel Highley, F.G.S., F.C.S., &c.

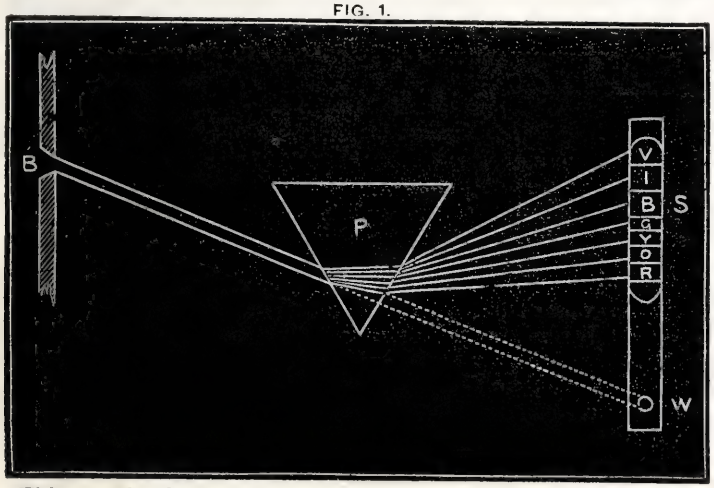
For some months past we have been waiting an opportunity to introduce to our readers a subject that has been exciting great interest amongst scientific observers; but, hitherto, matters more strictly photographic have had a claim upon our columns, and prevented us from entering upon a description of the method of spectrum analysis and of the deductions to which it has led philosophers regarding the constitution of the atmosphere that surrounds the solar nucleus, under which aspect the subject assumes an interest for photographers.

As the subject is an abstruse one to those who have not previously given it their attention, we will proceed step by step, so as to lead up to points of higher consideration.

When a beam of light passes obliquely from one transparent medium into another of different density, it is bent out of its course, and is then said to be *refracted*. This may be experimentally demonstrated in the following manner:—Take a parallel-sided glass vessel: paste two pieces of black paper over the back surface, so that only a narrow parallel strip of glass is left uncovered in the centre, and grey the front surface by dabbing it over with a ball of putty. Half fill the vessel with water, and place it with the slit opposite to a bright beam of light, in such a position that they stand perfectly at right angles to each other. An image of the slit will now be depicted on the front greyed glass of the tank, which will appear as a perpendicular line from top to bottom. If, instead of allowing the beam of light to fall *perpendicularly* on the back surface of the tank, it be made to strike it in an *oblique* direction, the image of the slit will now be separated into two distinct portions at the line where the water joins the air, the image of the slit being refracted or bent to one side, where it has had to pass through the denser medium, whilst the image of the slit that has only passed through the air in the upper portion of the vessel retains its original direction.

If, instead of allowing a beam of white light to pass through a parallel-sided body, it be made to fall obliquely on one side of a substance denser than air, and whose surfaces are not parallel, as that of a triangular prism formed of glass or other transparent media, on emerging from the opposite face of the prism it will not only be refracted, but the several rays, violet, indigo, blue, green, yellow, orange, red—of which white light is known to be composed—will be found to be separated from each other like the blades of a lady's fan, and are then in technical language said to be *dispersed*.

FIG. 1.



This may be demonstrated by allowing a beam of white light, B, *fig.* 1, to pass through a round hole in the window-shutter of a darkened room on to a white screen: at the point where the beam impinges, a circular spot of white light will be apparent, as at W, *fig.* 1. If the refracting angle of a prism, P, be now introduced into the path of the beam of light, B, the spot at W will disappear; as the light will then be refracted upwards, and at the same time be decomposed by dispersion into an infinite number of coloured rays, which follow one another, invariably in the order previously indicated, forming what is called *the prismatic spectrums*, it will be found that the violet rays will be refracted towards the base of the prism, whilst the red rays will be but slightly diverted from the apex or refracting angle of the prism, this being due to the different degrees of refrangibility of the different rays of light. The violet rays, being more readily refracted than the others, are diverted from their course to a greater extent than the indigo group, the indigo to a greater extent than the blue, and so on to the rays which suffer the minimum amount of refraction.

It will also be found that the *intensity* of these different coloured spaces varies, the yellow rays having the greatest intensity, whilst the brightness diminishes towards each end of the spectrum.

If, instead of allowing the spectrum to be formed upon the screen, as in the previous experiment, we view the aperture through the prism with the naked eye, a spectrum will be visible, but in an inverted order—that is to say, the red rays will then appear to be refracted towards the base of the prism, the violet towards the apex: this is called the *complimentary spectrum*.

It will be found in both these experiments that, whilst the width of the spectrum S, *fig* 1, is of the same diameter as that of the spot of light formed at W, its length is about five times as great.

It will also be found that if the prism be turned slowly about its edge, the spectrum first descends and then ascends; but, during a very small angular movement of the prism in either direction, the spectrum will become stationary. The prism is then said to be in the position of *minimum deviation*.

Different media not only have different refractive powers, but also different dispersive powers, as may be seen on comparing the spectra produced by two prisms of equal angles—one being made of flint, the other of crown glass: the former will be found to give a longer spectrum than the latter. But *dispersive power* is not directly related to refractive power; for two bodies having the same mean refraction will have different dispersive properties, and media having different refractive powers may possess the same dispersive power. Thus oil of cassia and flint glass do not vary materially as to their mean refractive power, but oil of cassia affords a spectrum nearly twice and a-half times as long as that of flint glass, prisms of equal angles being used. On the other hand, the dispersive powers of diamond and crown glass are equal, whilst their refractive powers are as three to one. Again: media having equal *mean* dispersive powers may have different dispersive powers for individual rays—thus, if two spectra of equal length, produced by two hollow prisms, filled respectively with oil of cassia and sulphuric acid, be placed in juxtaposition, so that the extreme visible violet and red rays coincide, it will be found that though the rays in both spectra occur in the order previously described, yet the spaces occupied by the several rays in the two spectra are not proportionate. In the oil of cassia spectrum, the most refrangible rays—as the violet, indigo, and blue—will be found to occupy a much larger space than that in the sulphuric acid spectrum; whilst the less refrangible rays, as red, orange, and yellow, occupy less space. In the sulphuric acid spectrum just the reverse occurs. If a line be drawn through the middle of these two spectra, it will be found to cut the blue rays in the oil, and the green rays in the acid spectrum. This results from the fact that, although the indices of refraction of the extreme rays of any two media may be equal, the index of refraction for the intermediate rays may be unequal. This phenomenon is termed the *irrationality of spectral dispersion*.

If a prism of the same media, but cut with a greater refracting angle, be examined, it will be found that the length of the spectrum or the distance of the mean rays from the extremities will be increased. On the other hand, if the refracting angle be lessened the length of the spectrum will be diminished. From what has been previously stated, it might be thought that there would be a difficulty in comparing the spectrum produced by one medium with that of another; but, by making an examination of the solar spectrum with proper precautions, instead of appearing as a continuous band of coloured rays, as in previous experiments, it will be found to be traversed in the direction of its breadth by many hundred *defective* or *dark lines*, which vary in different parts in width and distinctness. These are independent of the nature of the refractive medium employed, but they always occur in the same colour and at corresponding points of the spectrum. These lines being constant serve as fixed points for reference, in the same manner as degrees of latitude and longitude are employed by the geographer. The dark lines in the spectrum were first observed by Dr. Wollaston in 1802. 354 of them were subsequently mapped by Fraunhofer, the celebrated optician, of Munich, after whom they were christened as "Fraunhofer's Lines;" and in a communication from Sir David Brewster and Dr. J. H. Gladstone, read before the Royal Society, February, 1860, it is stated that the Scotch philosopher has delineated more than 2,000 visible and easily-recognised portions of the solar spectrum. The position of these dark lines varies with the source of light: each of the fixed stars has a system of lines of its own; and artificial lights produce characteristic spectra, that of the electric lamp consisting almost entirely of a few *bright* lines. It is to such phenomena we have now to direct our attention.

(To be continued.)

PERFECT POSITIVES AND NEGATIVES FROM PHOTOGENIC COLLODION.*

By M. Mc-A. Gaudin.

Having become assured, by my studies upon washed collodion, that the mode of development and the nature of the developer had the greatest influence upon the intensity of the proofs, I took a preparation of photogenic collodion, and I have the pleasure of announcing to my readers that I have succeeded in preparing a photogenic compound which has given me positives as white as snow, and negatives of an extraordinary clearness for printing. I cannot tell exactly how I composed it, the preparation was so complicated; but the fact is quite certain, and, as I have many times said, photogen will soon replace the sensitive collodion in the silver bath.

The way in which I operate at present is as follows:—I pour upon a plate some photogenic collodion, which, in large quantities, is of a greenish yellow, and upon the plate a very pure opal colour. The plate thus prepared is ready for immediate use, and in all probability will last sensitive for an indefinite time, for this photogen never dries.

After the impression the plate is washed in acidulated water intended for sensitive plates. When greasiness has disappeared, a pyrogallic developer is poured on, and when this has been well soaked in, some nitrate of silver is added (15 grains to the ounce), which produces a beautiful impression.

This photogen at present requires twice as long an exposure as the ordinary sensitive collodion; but, as the latter is found fifty times slower for obtaining positives upon paper than some impenetrable photogenic materials that I have already prepared, there is nothing to fear on that score, and I have not the slightest doubt that I shall succeed in preparing some photogenic collodion, leaving nothing to desire with regard to its sensitiveness.

I have just tried whether the photogenic collodion will keep its sensitiveness any length of time. After covering a plate with it I placed it in my small apparatus, using for a diaphragm a disc of card, pricked with the point of a pin not exceeding a millimetre in diameter. With a diaphragm of seven millimetres this apparatus gave me a negative, with a rapid sensitive collodion, after an exposure of ten seconds. The glass is a simple achromatic lens. My photogen being but half as sensitive, it required twenty seconds with this last diaphragm, and fifty times as long with my pin-hole—that is to say, one thousand seconds, or a good quarter of an hour. I left it exposed, however, two hours; and, on proceeding to the development, I only obtained a fraction of the background with the distance very faint in the positive.

From this failure I did not conclude that the photogen could not keep its sensitiveness any considerable length of time, because my apparatus was tried in an extreme case. It was exposed at the back to the full heat of the sun, and when I examined the plate before the development, I saw it was covered with very perceptible thin liquid globules; the plate must, therefore, have experienced a kind of roasting, which had undoubtedly destroyed the sensitiveness.

Soon after I took a negative with the same photogen and my aperture of seven millimetres. This negative I found perfect in all its parts; and, on comparing its background with other backgrounds upon some beautiful proofs obtained in the ordinary way, the background of the photogen appeared to me twice as intense.

In putting aside for the moment the permanence of its sensitiveness, which I had assigned to the photogen (a question which I shall soon decide), it will, perhaps, be proved from this day that the photogen supersedes sensitive collodion with the silver bath; and washed collodion already appears to me only a thing of the past.

Yesterday I found again great difficulty in preparing some photogen fit for use, but I have just thought of a process which will allow of my making it with mathematical precision, since I shall be guided in the proportions by a very slight change of colour; and I now find that I shall be able to prepare a photogenic albumen, which was impracticable by my former process.

Thus, before long, there will be photogenic collodion, gelatine, and albumen; and who will not then perceive how considerably photography will be simplified and rendered more attractive?

By making use of the inexhaustible resources of chemistry we shall obtain some preparations of a perfect permeability; and, as I have already obtained a photogenic collodion which is impenetrable upon glass, but more sensitive upon paper than the most rapid collodion, we cannot doubt the brilliant future which is in store for its perfection.

* From *La Lumiere*.

In this way everything will become possible, and I have no doubt of the preparation of an extra-sensitive photogen which, being poured upon a plate, will serve an indefinite time; for I can very well see that there is a way to render the photogenic preparation strictly insensitive to every influence apart from the actinic force, at the ordinary temperature.

STRAY CHAPTERS FOR PHOTOGRAPHERS.

By James Martin.

ON VARNISHES.

The subject of Varnishes has been brought under the notice of the readers of this Journal within the last twelve months, and is now resumed with the object of a more thorough treatment than it has hitherto received. The writer would refrain from adding to what has already been printed (which is satisfactory as far as it goes) were it not that the periodicals devoted to photography seem to have treated the matter with less accuracy and precision than its practical importance demands. It is, therefore, with a view to supply this defect that the present papers are written.

The investigation may be advantageously dealt with *ab initio* by pursuing the following inquiries:—

1. What is a varnish?
2. What are varnishes made of?
3. How are varnishes made?

These questions will first be examined in a somewhat abstract or general sense, and then with especial reference to photography.

First, then—What is a varnish?

A varnish is a solution of resinous matter applied to the surface of any body, with the object of imparting to it a hard translucent and shining coat, whereby it resists, with more or less success, the influences of air and moisture. This we conceive to be a tolerably fair abstract definition of a varnish. It may be further stated that the coating thus imparted consists of the resinous portion of the solution deposited in the form of a thin layer, consequent on the evaporation of the liquid solvent. A good varnish also should possess the following qualities:—Its brilliancy should remain unimpaired by lapse of time, and, while adhering perfectly to the surface to which it is applied, it should not appear dull or greasy, nor should it crack or scale off: its colour and lustre should not be altered by exposure to light and air, nor should it be long in drying.

These essential qualities are possessed more or less completely by all the members of the three classes into which varnishes are divided. These classes are—oil varnishes, turpentine varnishes, and spirit varnishes; and as it is especially with the latter class that photographers are concerned, our remarks will, it is conceived, be most advantageously limited to a description of their qualities. Speaking generally of spirit varnishes they are more brilliant, but, at the same time, more brittle than the varnishes included under the other heads—the toughest and best spirit varnishes being those containing lac or copal. But this brings us to the consideration of our second question—

What are varnishes made of?

Keeping in view the definition of a varnish with which we started, and which we may, perhaps, be allowed to call the text of this chapter, it is obvious that varnishes are made of resinous matter and a solvent. But, before answering this question in detail, we must ask permission to digress for a short time for the purpose of establishing by correct definition what is a resin?

It should be stated, in the first instance, that nearly all the substances which are employed to form the body of a varnish are known in commerce, and bought and sold in "the trade" under the general name of "*Gums*." Now, although this kind of loose phraseology may answer its purpose among dealers who merely buy and sell, regardless of the chemical properties of the substances they deal in, it is altogether inapplicable in cases where an accurate scientific understanding of the subject is aimed at; and such being, we feel assured, the object of the readers of this Journal, it becomes necessary to describe distinctly the difference between a *gum*, *gum-resin*, and *resin*.

Gum is a term only correctly applied when it refers to *a proximate vegetable principle* of almost universal occurrence, *characterised by forming with water a viscid, mucilaginous or slimy solution, and by its insolubility in ether, alcohol, and oils, and also by its convertibility into oxalic and mucic acids by the action of strong nitric acid.* Gum in numerous cases is a natural exudation, occurring in dried nodules on the bark of trees. It presents itself in three distinct modifications, known to chemists under the names of arabine, tragacanthine, and cerasine. The first of these is well represented by

ordinary gum arabic, the second by gum tragacanth, and the third by cherry-tree gum. In neither of these three varieties do the necessary properties exist to make a *true* gum applicable for photographic purposes, such as we now have in view: it is not therefore a *gum*, in the strict acceptation of the term, which enters into the composition of a photographic varnish. Let us, therefore, see if a gum-resin be a more suitable substance for our purpose. *A gum-resin is a concrete juice which has exuded in a milky state from incisions made in the bark, branches, and roots of certain plants.* It has assumed the hard condition in which it is found in commerce by spontaneous drying subsequent to its exudation, and is found on examination to consist of resin, essential oil, and gum. A gum-resin, of which gamboge is perhaps as familiar an illustration as can be cited, possesses the following qualities:—It is an opaque brittle solid, heavier than water, of variable colour, sometimes having a strong smell and an acrid taste; but especially characterised by being completely soluble *neither* in alcohol *nor* in water, but forming with the latter menstruum a milky mixture which seldom becomes transparent. That portion of a gum-resin which is soluble in alcohol is really and properly the resin, and the portion insoluble in alcohol but soluble in water is the gum. Gum-resins, besides these two principal constituents, contain, in many instances, volatile oils, imparting to them characteristic odours, and separable from them by distillation: they contain also several saline matters, and traces of wax, starch, bassorine, and caoutchouc. It will be seen therefore that their heterogeneous nature renders them inapplicable for the preparation of a fluid such as we defined a varnish to be at the outset.

Let us now, for a moment, turn our attention to the consideration of the properties of a *true* resin. Common "rosin" or colophony is, perhaps, as good an example of a true resin as could be selected; and, taking this as a type, resins may be described as *transparent, brittle solids, resulting from the hardening of a transparent exudation, flowing naturally from fissures in the wood or bark or from incisions made in the trees and shrubs which produce them.* Generally speaking, resins are inodorous and tasteless: their colours are generally derived from foreign substances, as when purified they are usually pale yellow. Some of them emit characteristic odours when rubbed, and all of them on the application of heat: this arises probably from the existence of slight traces of volatile oil. The greater number of them are heavier than, and insoluble in, water, but for the most part *completely* soluble in such menstrua as alcohol, ether, chloroform, essential oils, and benzole, &c. They are thrown down from their solution in alcohol in the form of a white pulverulent or curdy mass on the addition of water. Chiefly, however, true resins are characterised by a complete homogeneousness, which is absent in many of the gums, and entirely so in all the gum-resins; and it is this uniformity throughout its entire mass which makes a *true* resin so especially applicable in the manufacture of varnishes for photographic purposes.

Having, as we trust, now clearly explained the difference between gums, resins, and gum-resins, we will proceed to the consideration of the second question proposed, namely—What are varnishes made of? This subject has occupied the attention of chemists no less eminent than Ure, Aikin, and Dumas, the latter of whom prepared the following classified list of the materials employed in the manufacture of varnishes:—

	SOLVENTS.	SOLIDS.	COLOURS.
	Oil of Nuts	Amber	Gamboge
	„ Linseed	Copal	Dragon's Blood
	„ Turpentine	Mastic	Aloes
	„ Rosemary	Sandarac	Saffron
	„ Alcohol	Lac	Turmeric
	„ Ether	Elemi	Annatto
To which may now be added	Benzole	Benzoin	Red Sanders
	Chloroform	Colophony	Cochineal
	Methylated Spirit	Arcanson	Indigo
	Naphtha	Animé	

Now added *Dammar*.

In the preparation of black varnishes, also, the use of asphaltum and Indian-rubber or caoutchouc should be mentioned. The foregoing list, being a very complete one, obviously includes the materials for all three classes of varnishes: it is only necessary, however, for our purpose to consider those substances which enter into the composition of the varieties of spirit varnishes, as it is with these we are chiefly concerned.

Among the solvents, those especially interesting to the photographer are alcohol, chloroform, and benzole. These will be found described in due course under the head of *Notes on Photographic Chemicals:* it would be superfluous, therefore, to enter into a detailed description of them in this place.

In reference to the colouring matters mentioned in the list, it may be said that it would be desirable if the manufacturers of varnishes for photographic purposes would leave them out altogether, as they most of them impart an increased yellowness to the negative upon which they are poured. It should, however, be stated that the serious objections advanced by some operators to the yellowness possessed by some varnishes have hardly a sound foundation; for the printing qualities of some negatives are materially improved after varnishing with a yellow varnish, on account of the retarding action upon the light of the *slightly* yellow film protecting the middle tints. Moreover, the writer has ascertained by direct experiment that the amount of solid matter of all kinds deposited on a stereoscopic negative amounts to only one grain in weight; and, when it is remembered that this is diffused over an area in this particular instance of 21 square inches, the extreme tenuity of the film of resin and the small amount of colouring matter that can be present will become apparent.

A few general remarks on the characters and properties of the resins employed in making photographic varnishes will fitly conclude this portion of our chapter. These are animé, benzoin, dammar, elemi, mastic, lac, copal, amber, sandarach.

Anime is the produce of a tree growing in Brazil bearing the name *hymenæa courbaril*. It consists of two resins: one soluble in *cold* alcohol, and the other crystallisable from its *hot* alcoholic solution.

Benzoin occurs in commerce in two conditions:—the finer kinds being frequently distinguished by the name of Siam benzoin; the coarser and less pure kind being called Calcutta benzoin. It consists of white translucent tears, apparently connected by a brown transparent resin. These are separable into a peculiar acid (benzoic acid) and three distinct resins:—No. 1 being soluble in ether; No. 2 insoluble; and No. 3 soluble in ether and in solution of carbonate potash. The white translucent tears separated from the brown resin are soluble in benzole or chloroform, forming a very superior varnish.

Dammar or Dammara Resin.—A white resin brought from the East Indies, and said to be the produce of the *pinus dammara*. It contains, as many of the other resins do, two distinct resins—one soluble and the other insoluble in alcohol. Both are, however, completely soluble in benzole, leaving only an insignificant gummy residue.

Elemi contains about 60 parts of an acid resin soluble in *cold* alcohol, and 20 parts per cent. of an indifferent crystallisable resin soluble in *hot* alcohol. The resin is at first soft and slightly viscid, but becomes brittle and acquires hardness by cold and age. It is yellow, translucent, and of a peculiar odour not unlike fennel, and yields a volatile oil by distillation. As it occurs in nature it is "a concrete resinous exudation from one or more unascertained plants."

Mastic is yielded by the *pistacia lintiscus*, a native of the island of Chios. It occurs also in the south of Europe generally, the north of Africa, and the Levant. It is met with in small spheroidal, transparent tears, of a pale yellow colour, vitreous fracture, agreeable odour, and mild aromatic taste. When *masticated* it becomes tough and somewhat viscid. It fuses at about 250° F., and contains a very minute quantity of volatile oil, and about 90 per cent. of a resin readily soluble in alcohol. It is a valuable ingredient for varnishes, and is sometimes used for stopping decayed teeth.

Lac.—The sources of this valuable resin are numerous; being obtained from numerous trees belonging to the genera *ficus, rhamnus, croton*, &c., growing in Assam, Siam, Pegu, Bengal, and Malabar. Its formation in the plants seems to depend upon the puncture of a small insect *(coccus ficus)* made for the purpose of depositing its ova. The three varieties of stick lac, seed lac, and shell lac, are thus produced:—The puncture of the insect being made, a coloured juice soon exudes, which concretes upon the small twigs and branches: this concrete, highly-coloured resin constitutes the *stick lac* of commerce, and this, on being separated from the twigs, roughly powdered and washed with water to remove the greater portion of the colouring matter, constitutes the *seed lac;* and the conversion of this article into *shell lac* is effected by fusion, straining and dropping while still hot on a smooth surface, so as to spread out into thin brittle plates on cooling.

The solution of this resin in alcohol appears to be greatly facilitated by powdering it very finely, and then exposing it for several months to the action of the air.

Copal occurs in hard pieces of a delicately yellow tint pos-

sessing a conchoidal fracture, transparency, and often including (like amber) insects and vegetable remains. It is inodorous and tasteless. It acquires viscidity when heated. When boiled in alcohol a small portion only dissolves, and the residue swells and softens. According to M. Sœhnée (as quoted by Dumas) copal acquires solubility in alcohol by being reduced to an impalpable powder, and exposed to the air for at least twelve months.

AMBER is a fossil resin composed of $C_{40}H_{32}O_4$. It is found chiefly on the southern shores of the Baltic, between Königsberg and Memel: it occurs also in bituminous wood and in beds of brown coal. It is transparent, or translucent, and of various shades of yellow and brown: its specific gravity is 1·06. Berzelius regards it as a mixture of two resins, bitumen volatile oil and succinic acid. It fuses and burns on being heated, giving off a somewhat agreeable aromatic odour. It requires peculiar management to effect its solution either in alcohol or oils: chloroform appears to be its best solvent.

SANDARACH is a most useful resin in the preparation of varnishes—occurring in small, brittle, yellow drops, easily fusible, and soluble in alcohol. It is the produce of *thuia articulata*—a plant indigenous to Barbary—and the resin is imported from Mogadore. Like many others it is separable into three resins distinguishable only by their relative solubility in hot and cold alcohol.

Having thus far considered our subject, we will postpone the treatment of the third inquiry to a future number.

THE TANNIN PROCESS.

By MAJOR RUSSELL.

[*By the special permission of the Author we reproduce the following.*]

GELATINE, simply dissolved in water, is always slightly milky, and the impurity, whatever it may be, is not removable by filtration, but soon clogs the paper. If a glass be covered with the milky solution, the white substance, when dry, appears like a fine dust adhering to the surface of the gelatine, and unless polished off by hard rubbing, sometimes shows slightly in the transparent parts of the negatives. These inconveniences may be entirely avoided in the following manner:—Soak the gelatine in distilled water, two to five grains to the ounce, adding one drop of glacial acetic acid for each grain of gelatine. When thoroughly swelled and transparent, dissolve by warming. Should the water be heated before the gelatine has had time to swell, the latter will adhere to the bottom of the vessel containing it, in a stiff glutinous state, and will dissolve with great difficulty. Add one drachm of pure or methylated alcohol to each ounce of solution, and filter two or three times through filtering paper in a warm place. The acetic acid coagulates the white impurity, which then collects into filaments, and is removed by filtering, leaving the solution very bright. This solution will keep for a long time; but, should it decompose from loss of alcohol by evaporation, it must be rejected. Any decomposition may be detected by a disagreeable smell, and by the solution becoming limpid.

A two-grain solution of gelatine scarcely requires warming to work well, if the temperature of the room be not much below sixty degrees. Gelatine liquid of this strength answers well with a thin collodion; but, when the collodion is thick, it is apt to fail, by allowing the film to loosen during development, which is fatal when gelatine is used, although not necessarily so in the case of simple uncoated glasses. It is therefore advisable to use the gelatine solution strong enough. A five-grain solution may be depended on for producing sufficient adhesion, whatever be the nature of the collodion, and gives but little extra trouble in preparation. The strength of the gelatine solution ought certainly to be proportioned to the thickness of the collodion film; but, nevertheless, considerable latitude is admissible—so much so, that any solution containing between two and five grains to the ounce will answer in the majority of cases. The effect of using too little gelatine is insufficient adhesion; of using too much, blueness of the film, general insensitiveness, and want of vigour in the negative, from the penetration of the gelatine to the surface of the collodion. Should this penetration be uneven, markings of insensitiveness will be the result.* A solution of isinglass may be substituted for that of gelatine, if of about half the strength, that is from one to two and a half grains to the ounce; but it does not appear to make the film adhere quite so strongly to the glass. Isinglass may, however, possibly answer better than gelatine in very hot weather, as the former remains undissolved at a higher temperature than the latter.

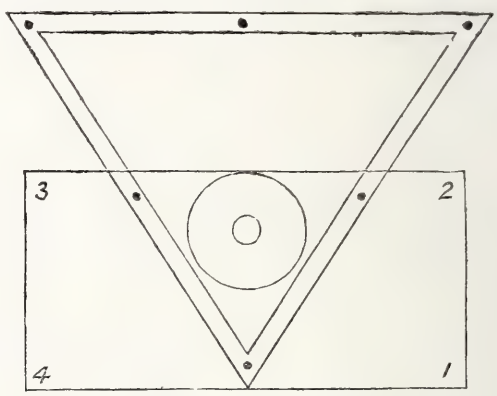
* The writer has not seen these faults except when using a ten-grain solution of gelatine, or a five-grain solution of isinglass, for experiment.

Should there be a fire in the room, place the draining stand before it on a chair rather than on the floor, for obvious reasons. The glasses should be all on the side of the stand next the fire, and the distance from it such that they will become a little warmer than the hand.

Whatever method of applying the gelatine be adopted, the plates must be warmed after cleaning, or traces of the cleaning liquid, remaining in the pores of the glass, will repel the solution, causing circular spots of bare glass to appear on draining. Warm the gelatine by putting the bottle, which should be thin, inside the fender, or more quickly by dipping it in hot water, taking care not to immerse beyond the surface of the solution, or the bottle may be broken. Take a small cylindrical glass vessel called a beaker (the best are those which have the rim most turned out) and a glass funnel. The nose of the funnel may, if necessary, be shortened by notching with a file, and breaking to such a length as to be just clear of the bottom when the cone fits the upper part of the beaker. The broken end should be ground smooth on a grindstone, or other rough stone, to prevent risk of scratching the plates.

Cut a piece of new fine-grained sponge into a truncated conical shape, the outside forming the thicker end, to be placed upwards. Soak in water, and knead well under a tap to remove loose particles; push rather tightly into the neck of the funnel; then pour in enough gelatine solution to stand in the beaker higher than the top of the sponge in the funnel: it will pass through quickly.

Take up a glass with a pneumatic holder, sweep with the velvet rubber, and place on a levelling stand with the holder still attached. If the plate be large the holder should be in the middle, if of stereoscopic size close to the edge of the plate, when there will be room for it if the levelling stand be of suitable size (about 6¼ inches between the screws at the corners), the glass



Bird's-eye view of a stereoscopic plate on a levelling stand with the pneumatic holder attached to it.

resting on two of the screws in the middle of the sides of the triangle, and on the screw at the angle nearest the operator. Take the funnel in the left hand, and hold nearly or quite in contact with the surface of the plate near corner 1; then with the right hand pour the solution from the beaker on the same corner, nearly touching the surface of the plate with the rim, to avoid making bubbles, until about a quarter of the glass is covered; then replace the funnel in the beaker hold in the left hand under corner 4, and, taking the holder in the right hand, lift the end of the plate on which the solution has been poured in such a manner that it will flow to the left, inclining from side to side to keep the advancing edge of the liquid convex until the plate is covered; then pour off into the funnel from corner 4. With a little practice this operation is quite as easy as pouring the collodion, the solution flowing very readily on glasses cleaned as described above.

Should any difficulty be found at first, the gelatine may be spread with a glass rod bent at one end, which may be placed ready for use in a clean glass measure, or the flow of the solution may be assisted with the nose of the funnel. It is better to dispense with the use of the glass rod, as dust may fall on it and so be introduced into the solution and left on the plate. This would render a second pouring on and off necessary. Next set the plate up to drain on corner 3, between two of the pegs of the draining stand on the farther side from the fire, taking care that the glass rests against both pegs, to ensure its standing firmly. Blotting paper should previously have been placed between the pegs to absorb the liquid; a piece about two inches square, folded

in equal parts three times, so as to give eight thicknesses, will be enough for a stereoscopic plate. If the glasses are drained on the side next the fire, a hard line will be formed near the two lower sides, like that produced in drying by the thick edges of negative varnish: this line would show in the picture, but is never formed when the gelatine is allowed to dry spontaneously. Proceed in the same manner with the other glasses: if these are slightly warm the gelatine will be kept sufficiently fluid. When too warm the solution becomes limpid, and does not flow regularly, leaving also a thinner film upon the glass. The best consistency is about that of iodised collodion.

Should it be preferred, the gelatine can be poured exactly in the same manner as collodion, without a levelling stand, by using two beakers, and placing the funnel in one, while the solution is poured on the plate from the other. In this case, after returning the liquid from the plate into the glass, pour it into the funnel to remove dust.

One side of the draining stand will be filled with gelatinised plates long before the first has had time to dry; therefore, if more are to be coated they must be placed to drain elsewhere. In taking up the glasses to cover with gelatine clear one end of the stand first, and when the gelatinised plates appear to be dry, excepting at the lowest corner, place them on the side next the fire, at the end cleared by their previous removal. When all the uncoated glasses have been removed from the stand the coated ones should be spread along, in the manner described after washing the glasses, to complete the drying by heat.

The above plan will answer well if a place near a fire can be found sufficiently free from dust. The plates being drained with their faces inwards are not very easily affected in this way, but care should be taken that no dust, especially from ashes, comes in contact with the surface when wet, in any stage of preparation: when dry this is of little consequence, as it can be brushed off again. Should it be found desirable to perform this part of the process in a cold room without a fire, a simple warming apparatus may be extemporised in a few minutes, thus: place a Child's night light in a gallipot lid containing a little water, put on each side of the light a piece of wood about half an inch higher than the top of the flame, cut a piece of tin with an old pair of scissors (a piece of any kind of canister will do), long enough to reach from one piece of wood to the other, and a little wider than the glass which contains the gelatine solution. Should the tin not be sufficiently rigid it may be made so by turning up the edges; this will at the same time prevent the glass slipping off. Having warmed the solution to commence with, after coating each plate place the beaker on the tin over the light whilst setting up that plate to drain and taking up another: this will keep the solution quite fluid enough.

By adding more acetic acid, the gelatine may be used in a cool place without any artificial warming. One drachm of glacial acetic acid to seven drachms of water, or an equivalent proportion of weaker acid, and five grains of gelatine, will work in this way; but in such a case the plates must be quite cold, or the solution will be rendered too limpid. This plan is not quite so safe as that described before, but will answer well if the plates are heated pretty strongly for some time to complete the drying. Acetic acid does not change the gelatine into metagelatine like some other acids, but merely acts as a solvent, and, being volatile, is easily driven off by heat. The acid, if not thus removed, would cause solution of the gelatine during the subsequent exciting and washing.

The previous coating of gelatine is peculiarly suited to this process, as the tannin solution, when concentrated by drying, coagulates the gelatine partially, if not entirely, so that it holds to the glass with great firmness, and cannot afterwards be loosened by any amount of washing, provided an alkaline liquid be not applied to the film. The working of the gelatine will be found very easy and certain in practice if done as described above. The plates can be coated and set up to drain at the rate of more than one per minute, and unless dust fall on the surface between the pouring off of the solution and setting up to drain, a speck will never be seen on the film.

The gelatinised plates will remain good any length of time if kept perfectly dry. To secure this, after thoroughly desiccating by heat, pack the glasses face downwards (except the lowest glass, which should have its face up), with a strip of blotting paper at each end folded like a fan, a fold being inserted between each plate and the next, beginning with the lowest and working upwards. The glasses may then be stored in a tin box, into which should also be put a lump of quicklime, folded in thick filtering paper and tied round with a string. The inside of the box and the strips of blotting paper should be previously warmed to ensure dryness. The gelatinised plates may be kept in a common grooved box, if in a very dry place; should they be put away damp, or should moist air get access to them afterwards, mould would form on the gelatine, which would show in round black spots on the negative.

It will be found practically that it is much easier to produce perfectly clean negatives with the gelatine than without it, and that this coating has the further merit of effectually masking slight scratches and defects in the glass, to say nothing of the advantage of rendering success independent of the mechanical condition of the collodion.

The gelatine does not appear to injure the bath for use in this process, or in all probability for any other process in which the whole of the nitrate of silver is removed by washing: a bath in which gelatinised plates had been excited for months, was found to produce negatives quite as bright and vigorous as if freshly made, although no precautions had been taken, such as wiping the backs of the glasses to remove gelatine. So little indeed was this bath injured that it would produce brilliant and vigorous negatives by the wet process when a collodion containing a large proportion of bromide was used; the plates excited in it showed no tendency to fogging, and resisted solarisation remarkably well. Should it, however, be desired to prepare plates for this process in a wet collodion bath without injuring it, at the same time securing all the advantages of the gelatine coating, a plan will be described in the concluding chapter which, at the cost of a little more trouble, will fulfil these conditions, and give even greater adhesion.

It is not absolutely necessary to use any preliminary coating, as the process, with many samples of collodion, can be worked without such precaution. The glasses should in this case, as before stated, be ground a little way on the surface, and if the film even then show signs of slipping off, the extreme edge must be painted round with thick quick-drying spirit varnish when dry. This operation may be conveniently performed in the following manner:—Bore a hole vertically through the cork of a one-ounce phial, and insert firmly a small cylindrical piece of wood, about two-thirds as long as the height of the phial; tie a small camel's hair brush to the wood, in such a position that the latter projects half an inch or so beyond the point of the brush; keep the phial about half full of negative varnish from a bottle which has been nearly used out, that it may be thick enough to prevent splashing; the brush, being kept in the bottle with the varnish, will always remain soft. To varnish the edges of a plate, take it up with a pneumatic holder, and draw the brush round, the wood acting as a guide against the edge of the glass, so as to varnish only a strip one-eighth of an inch wide or less. If the plates are to be used for printing transparencies on, the edges should not be varnished till after exposure, or the thickness of the varnish will prevent contact of the plate with the negative.

On wetting the film previous to development in this mode of working, the collodion will probably expand strongly, so as to be forced up into ridges all over the plate; but sometimes it will contract again in the course of ten or fifteen minutes. The development must not be proceeded with until the contraction has taken place, or the fluid will get under the wrinkles and produce narrow dark lines in the negative. Should the film contract enough to lie smoothly it will not become loose again, and when dry will adhere firmly to the glass; but sufficient contraction does not take place with some kinds of collodion, and hence this mode of working is open to the objection of making success dependent on the mechanical state of the collodon.

Even when quite successful, this mode of proceeding involves quite as much time and trouble as when gelatine is used, especially if the edges require to be varnished. The character of the picture will not be very perceptibly different whether gelatine be used or not; and, with the exception of the precautions described above, the treatment may be the same throughout in either case.

VARNISHES.

THE subject of varnishes for photographic purposes is one that has frequently of late attracted an unusual share of our attention—partly because several of those enjoying until recently a high reputation have at length been complained of, and partly because the importance of varnish as a protection to fine negatives is becoming more generally acknowledged, especially by amateurs, who have been very apt to imagine that because they require but a few copies from their negatives the trouble of varnishing them may well be dispensed with.

While thinking over these matters, we have just received from Mr. Henry Rigge samples of varnishes for negatives and positives respectively alleged by him to possess certain properties and advantages which he enumerates as follows:—

"The gum held in the alcoholic solution is one of the hardest nature, purified by a complicated chemical process: the varnish for positives holds besides a certain amount of another gum, to facilitate the adhesion of powder colours.

"Unlike all other spirit varnishes, they dry bright without heat; and if heat be applied the film becomes very hard. But one of the most novel and advantageous properties of the negative varnish is that it may be applied on the plate before it is quite dry, thereby preventing the collodion from shrinking, cracking, peeling off, &c., in drying. It is certainly very valuable for dry plates, when some time after having a good negative it cracks, either in drying or heating it previous to varnishing.

"The way I use it in such a case is as follows:—I stand the negative to drain well after the last washing, and, while the film is yet damp (not too wet), I pour on a coating of varnish, which evaporates with the collodion, and in drying keeps it down, preventing all cracking, &c. I either print from it as it is or varnish it over again. In such a case, the dampness of the film absorbing a portion of the gum from the varnish prevents it drying bright; but a subsequent coating when dry will render a beautifully even surface."

We have as yet had no opportunity of testing the qualities of these varnishes; and, as it may be some little time before we can do so satisfactorily, we think it advisable not to delay making mention of the existence of these new candidates for photographers' suffrages, in order that some of our experimental readers may, if so inclined, try them for their own benefit and that of others.

ON THE BEST FORM OF RECEPTACLE FOR THE NITRATE OF SILVER BATH.

M. l'Abbé Despratz, a photographer whose name will be sufficiently familiar to those of our readers who practise the resin process, has, in a communication published in the pages of *Le Moniteur de Photographie*, discussed this question, and arrived at a conclusion somewhat surprising to us. The question, however, is narrowed to a comparison between the advantages of a vertical and a horizontal receptacle, though the latter may assume either one of two forms. Regarding the vertical form our author says:—"In spite of the apparent advantages which it affords, above all to the novice, its employment is at first very costly, in consequence of the necessary capacity of the vessel, which must be considerable, in order to allow the plate to be freely moved therein. If for economy the broad sides of the vessel are made rather close, it is very difficult to free the vessel from the metallic reductions which constantly cover the surface; and the plate being only capable of immersion by aid of a 'dipper,' we can only with difficulty regulate its rate of progress into the liquid. Frequently in using a vertical bath receptacle the plate becomes injured by vertical transparent lines, owing to a partial displacement of the iodide from the film, and, consequently, the image is absent from the parts denuded."

With respect to the horizontal dish, there are two ways in which it can be applied. Firstly: so that the collodion film shall remain upwards. Secondly: by the introduction of an inoxydable ledge, to prevent contact with the bottom of the dish, the collodion film may rest in a downward position with regard to the plate.

In the first case, the liquid being collected at one end by tilting the dish, and the plate laid face upwards on the uncovered part, by lowering the dish to a perfectly horizontal position in a dexterous manner the liquid may be made to cover the film evenly in one regular wave; but, unfortunately, as the collodion film becomes thus in practice the bottom of the dish, any impurities that are contained in the liquid of course become deposited on the film itself. By adopting the second of the two suggested methods, however—that of supporting the plate, film downwards, at a short distance from the bottom—all chances of a deposit on the film are avoided, even if there are particles of foreign matter present in the liquid; so that frequent filtration, to which photographers are too prone (according to the Abbé), is rendered unnecessary. The film of oxide, induced by exposure of the surface to the air, can readily be removed by "scraping" across it a band of stiff paper.

It is not necessary to enter into a description of the various defects to which a collodion film is liable by want of skill in the operation of immersion, as they must be sufficiently well known to our readers; sufficient to state that the paper before us is evidently written by one who has arrived at a foregone conclusion in favour of the horizontal dish, alleging that, by the use of the latter, the film of iodide of silver is generated more slowly and therefore more uniformly than when the vertical bath is adopted. It is asserted that, for old collodion, a rapid immersion in the nitrate bath is desirable; but for that which is new, the old adage, "*festina lente*," is applicable—that is to say, to proceed slowly, but without a pause.

Admitting, for argument's sake, the accuracy of the principles enunciated by the worthy Abbé, we fancy there are but few practised photographers who will concur in the conclusions at which he arrives. English photographers have, as a rule, long since arrived at an opinion that a small quantity of nitrate of silver solution for a sensitising bath is very false economy.

STEREOGRAPHS.

Scenes in the Hebrides, &c., photographed by GEORGE WILSON, *Aberdeen.*

THIS beautiful series of illustrations, charming alike to those who have and to those who have not visited the picturesque scenes depicted, has been in our possession for some months past; but, owing to press of other matter, has not hitherto received at our hands that attention which the excellence of the productions merits, albeit they were the fruit of labour during last year's moist summer and still more moist autumn.

The first which strikes our attention is a singular rocky mountain, of a conical form, called GLARNICH, IN THE ISLE OF SKYE (No. 271). A more desolate-looking spot it would be difficult to imagine than the scene before us—the conical mountain standing out of the dreary plain strewn with the huge boulders that the rushing waters have carried down its sloping surface almost in straight lines, scratching the same in deep seams radiating from the apex of the pyramid. The air of solitude is enhanced by the reflection of the upper half of the mountain seen in a lonely pool, the waters of which do not appear to have the slightest ripple—so still it now seems, in marked contrast to the evidences of former storms, raging in fury, which have left their impress on the surrounding objects.

From this same island there are two views—QUAIRANG (Nos. 263 and 264). Both of these are scenes of great interest, and, though of a similar character, the last-mentioned possesses the most abundant elements of the picturesque. Through a huge fissure in the primitive rock the spectator looks down upon that designated "THE NEEDLE," and beyond, on either side, the rock is grotesquely rent and torn in roughened fragments, presenting to the eye all the appearance of some populous town built around the base of a sheltering hill. The comparatively level ground beyond, broken here and there with a patch of water, is suggested rather than depicted; and this is precisely one of those productions that we should like to show to the South Kensington authorities, and others who declare that there is an absence of soul in the photographer's art.

SCUIR-NA-GILLEAN, FROM GLEN SLIGCHAN (No. 268), and a distant view of the same (No. 269). Both present features of geological rather than of pictorial interest.

Travelling south, we come to scenes of a totally different character. What can be a greater contrast to the preceding than THE PATH TO THE WELL, TABERMORY, IN THE ISLAND OF MULL? A lovely woodland path, high up on the hill-side, winding round the steep acclivity, and well shaded with sturdy oaks with gnarled and knotted stems. Two bonnie little Scotch lassies, who have thrown themselves upon a bank by the road-side for a gossip, each with her hand upon her water-can, add not a little to the beauty of the subject.

TABERMORY, ISLAND OF MULL (No. 255) is a tranquil-looking town, built close to the water's edge, with wooded hills of gentle slope and small eminence behind. The foreground is occupied by a framing of ash and fir trees, and the "middle distance" by the little harbour, bearing on its waters a few small vessels.

THE AROS WATERFALL, NEAR TABERMORY (No. 257), though a picturesque scene, is not so cleverly executed as the generality of Mr. Wilson's productions of this class, the water being less transparent and more woolly than is usual with this clever operator.

We have several illustrations from the renowned little island of STAFFA—that basaltic gem of the ocean. All are interesting; but perhaps the most so is No. 16, THE MOUTH OF THE CLAM SHELL CAVE. Certainly, as an artistic subject, this is a fine companion to FINGAL'S CAVE (No. 17); but, as no description that we could give would convey any real idea thereof, we shall not attempt it. The

two named, together with No. 15, THE COLONNADE OF BASALTIC PILLARS, should be in every collection.

From IONA Mr. Wilson has brought away THE RUINS OF THE CATHEDRAL (No. 39), ST. AUSTIN'S CROSS (No. 258), and MACLEAN'S CROSS (No. 259), of which the last-named is the one possessing most pictorial value. At the foot of the ancient carved stone cross are seated four lads in true Highland costume. The crooked roads and rough stone walls, enclosing some fields yielding a scanty pasturage, and in one instance a scanty crop of grain already in sheaves, are backed by the rough farm buildings and still rougher masses of rocky hill-side.

Amongst the miscellaneous slides are two which deserve special mention, viz., OBAN, IN ARGYLLSHIRE, (No. 32*a*), where, as in Tabermory, the houses are built close down to the water's edge, under the shelter of the hill; but in this place they form three sides of a quadrangle. The general aspect of the place reminds us very strongly of Helensburgh, on Loch Long.

The last we shall mention in the present notice is BEN NEVIS, FROM ABOVE CORPACH, INVERNESS-SHIRE, a scene of tranquillity and dreamy repose, where the undulating mountain sides, seen across the curve of a bay, are capped with cloudy vapours, and rendered as only Mr. Wilson renders them.

It has been asserted (whether truly or not we cannot say) that Mr. Wilson has this year gone out with a pair of panoramic lenses. We trust it may be so, and shall sincerely rejoice if he be successful in their application to such scenes as those we have just been inspecting; for it is especially in this class of subject that the beauty is too frequently marred by the absence of sufficient expanse of view. It is true that there would be required some modification of our present stereoscopic arrangements to display properly the specimens thus taken; but they would be worth that trouble. It is also true, alas! that much complication and extra trouble would be incurred in taking such views, especially upon moist collodion, as it would be necessary that two separate plates should be employed for the two pictures, and this involves probable difference in sensitiveness, &c. We shall, however, look with interest to the close of the present campaign.

Record of Photographic Inventions.

By SAMUEL HIGHLEY, F.G.S., F.C.S., &c.

[NOTICE.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

COLLODION FILTER.

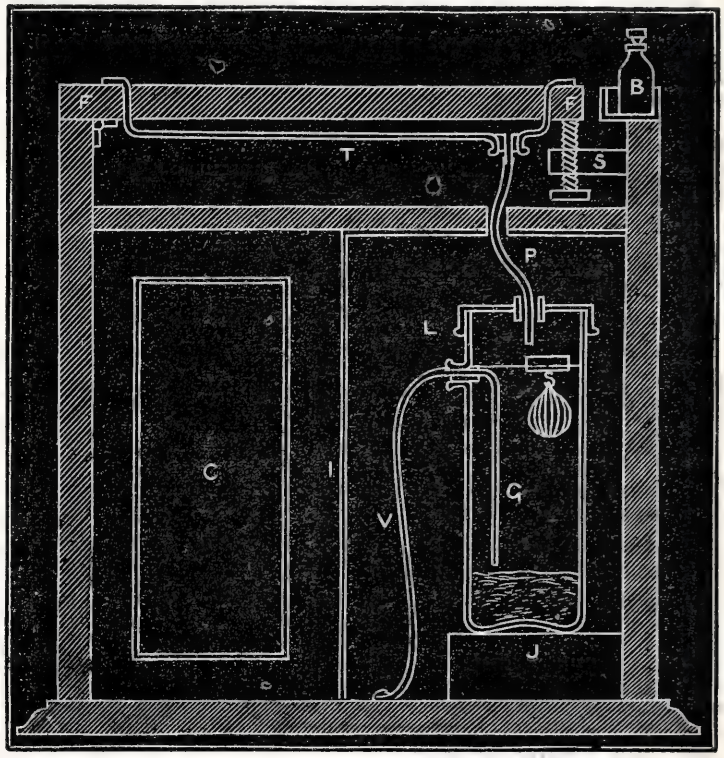
M. Mc-A. GAUDIN recommends an arrangement for filtering collodion which he states answers better than any other method he is acquainted with, and by which three quarts of collodion may be filtered in less than an hour. A zinc cylinder, two and-a-half inches in diameter and four and a-half inches high, fitted with a wire-gauze bottom, is, by means of an external flange, soldered about an inch above its lower end, supported over the mouth of a long glass or earthenware jar; a sheet of filtering-paper is then arranged so as to cover the bottom and sides of the metal cylinder, up to its mouth, and a funnel, with a tuft of cotton-wool pressed into its neck, is placed in the mouth of the upper vessel. Iodised collodion is then poured into the funnel, from whence it passes into the second filter, and, in its passage to the receiving vessel, is freed from all floating particles that tend to form spots in the film. As a further precaution, or where only small quantities of material have to be treated, it is recommended that the collodion be passed through a filter formed of a piece of filtering-paper, folded in four, and placed in *a smooth-sided* funnel. M. Gaudin finds that collodion is not properly freed by rest and decantation, or by passing it through cotton; and if a fluted funnel with the creased filter-paper usually employed with this form of support be used, action is soon stayed, as the collodion hardens on the external surface of the paper through the facilities offered by the flutes for the rapid evaporation of the alcoholised ether. On the other hand *a smooth* filter, placed in *a smooth-sided* funnel, retains an etherial atmosphere between the surfaces of the glass and paper that tends to keep the pores open, and prevents the formation of any hardened film through evaporation.

The funnels ought always to be kept covered with glass plates; and, if large quantities of collodion are being filtered, a little ether ought to be added from time to time to compensate for any evaporation that may take place.

It is suggested by M. Gaudin that the *smooth* paper and funnel would be very suitable for the filtration of albumen.

DEVELOPING SINK.

HAVING lately arranged for a friend the details of a small photographic laboratory, we purpose describing the construction of a developing sink that formed part of the arrangements, planned to economise the silver carried away with the waste developing solutions.



The sink itself, T, is let into a wooden frame, F F, that is hinged at one end so as to overlap a stout upright projecting above the top of a portable cupboard, C; the other end of the frame rests upon the end of a stout wooden screw, S, that passes through a bracket attached to an upright on the opposite side of the cupboard: this allows of the sink being brought to a level, or of one end being depressed to facilitate drainage after the day's work is over. A vulcanised India-rubber pipe, P, carries off all liquid to the precipitating jar, J, which is mounted on a block of wood, placed in one compartment of the cupboard. This consists of a glass jar, with a perforated neck in the side, about one-fifth of the height from the top: in this a perforated cork is fitted, through which is passed, from the inside, the bend of the short arm of a syphon, G, this part being made of glass tube, and a piece of vulcanised India-rubber, V, is fixed to the projecting end of the glass tube to form the long arm of a syphon. The lid, L, of the jar is formed of gutta-percha, with a hole in the centre of it for the waste-pipe, P, to pass through: a lump of chloride of sodium is tied up in a piece of muslin and fastened to a bung, so as to keep it floating near the surface of any liquid with which the jar may be filled. The end of the syphon is passed into a drain-pipe, gutter, or other convenient outlet. The action of the arrangement is, that whatever waste fluid enters the jar is saturated with salt, and any silver it contains is precipitated as chloride. As soon as the liquid reaches the level of the bend of the syphon it sets it into action, and thus the jar is emptied: when the jar is again filled to the level of the syphon bend, the action again sets in, and thus by an intermittent action it is emptied of the supernatant liquid that has been freed of any silver it contained on leaving the sink above. Whenever the deposit of chloride of silver attains nearly to the height of the lower end of the syphon it must be removed, as it would be sucked over with the outgoing column of liquid: whenever the salt is dissolved out of the muslin bag it must be replenished. Both of these occurrences are observable through the glass jar. A door closes in

this part of the cupboard: the other compartment is fitted with drawers and shelves for the stowage of bottles, baths, developing-stands, &c. On the right hand side of the sink is fixed a tray, B, for bottles and developing measures. On the left hand side, on a bracket over the sink, a water filter is placed, and on the right hand side a large glass bottle, fitted with a boxwood tap, holds distilled water. Beneath the sink a gutta-percha dish is kept, filled with water, into which all spoilt plates are put till the films are rubbed off: from time to time this is emptied into the jar, J, spoilt films included.

Hypo. or cyanide fixing solution should be poured over the plate when resting on a levelling stand placed within a separate gutta-percha tray kept at one end of the sink, to prevent its mingling with the other solutions, as these are not decomposable by chloride of sodium. The fixing solution may be poured back into the bottle and used over and over again till saturated, when they may be stored in a carboy or large bottle till a convenient opportunity offers for precipitating the contained silver with silver of sulphur (sulphide of potassium).

Peligot has stated that if strips of zinc foil are kept in a solution of chloride of sodium, that silver will then be precipitated, not only from the developing but also from the fixing solutions, but we have not yet tried this method.

Where rooms or cupboards cannot be devoted to photographic purposes, this form of sink might be turned into a dark tent by fixing long uprights at the corners, and a projecting frame above, over which a voluminous black twill covering might be thrown, having the usual yellow window let into the front part.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

THE IMPORTANCE OF ENTIRE TRUTHFULNESS—THE STANDARD OF TRUTHFULNESS—EDUCATION OF THE EYE—THE WORKS OF EMINENT MASTERS IN LANDSCAPE ART TO BE CAREFULLY STUDIED, BUT NOT BLINDLY, OR APART FROM NATURE—THE LENS—DEPTH OF DEFINITION AND AËRIAL PERSPECTIVE.

"The visual eye asks guidance from within,
And as *that* cometh is *its* power increased."—*Swain.*

"As all our ideas of beauty are derived from a contemplation of the works of nature, our perception can never exceed the beauty of *her perfect* works."—*J. D. Harding.*

MY DEAR FELLOW-STUDENT,

In my first communication I decided that the real aim or purpose of landscape art was the *truthful* representation of the grand or beautiful objects and phenomena of natural scenery. It is now desirable to establish the importance and the necessity of such an object or purpose, in order that we may overstep the threshold of our present studies with a clear and settled view, instead of a loose indefinite notion. This may, I think, be very briefly done.

The perfection of all art is very generally admitted to be attained when it escapes observation. "*Ars est celare artem*"—the essence of art is its concealment. On the stage, it was Cato or Coriolanus, not Kemble—Othello or Richard, not Kean, that filled the minds of the spectators. So is it said of the great actor Fechter: he does not not *play* Hamlet, but he *is* Hamlet. As in the actors' art, so in the picture makers': the art, while making itself none the less powerfully felt, is most effectually concealed by, or forgotten in, the impression of *truthfulness;* and this, I therefore argue, is the perfection of all art. Think over this awhile, if you please, because on this assertion I build my coming argument.

By truthfulness I do not mean that small and fragmentary quality which renders all the minor inferior truths at the expense of the superior or greater truths; which shrinks from depicting nature as sublime, poetical, or picturesque; and revels in the petty commonplace details of a foreground weed or the pattern of a check dress. By truthfulness I mean that grand and mighty quality which depicts the perfect whole—the spiritual as well as the material aspects of nature. This is my ideal truthfulness.

Next comes another fact which must be considered: that which seems truthful to one is false to another. How then are we to decide? What standard have we by which to test our conception of entire truthfulness? By general consent the eye is regarded as this standard of truthfulness. This is an error. "What!" certain folk will exclaim—"are we not to believe our own eyes?" And we reply—"to a large extent, decidedly not." The artist knows well enough that it is not the eye but the mind that sees, and that by educating the latter the former acquires new powers of vision which it could never otherwise attain. Guided almost entirely by the faculty of sight the infant's conceptions of surrounding objects are altogether false and indefinite: its plump and dimpled little hands are stretched as eagerly forth to grasp the moon as any other bright attractive object within its reach, and the uncertain state of mind the funny little soul is in respecting the whereabouts of its eyes, nose, and mouth, must have made you laugh as often as myself; for all this, the infant *sees* quite as well as yourself, only the *mind's* conceptions are so comically imperfect. I remember reading of a blind man who, being suddenly restored to sight, would fain have walked out of a first floor window into the garden below, supposing one to be level with the other. Indeed there are many such anecdotes extant. Locke, while pointing out that the mind is the actual seat of all our sensations, showed us how, when the thoughts chanced to be engrossed by any one particular subject, to all beside that the eyes became blind and the ears deaf. How often, when deep in thought, do we pass the dear and familiar faces of intimate old friends, not only unnoticed, but positively *unseen;* because the images upon the retina of the mind were for the time actually more real than those which gave their light created impressions to the outward eye. Ruskin, in reference to "the universal error of belief among the thoughtless and unreflecting"—that, seeing "what nature is with their own eyes, they can surely find out for themselves what is like her"—says: "not only must we learn to *recognise* the truths of nature when before us, but the memory and imagination must be so trained as to retain them, in order that their impression may be lasting and their effect *thoroughly grasped.*" He also points out how "the influence of the imagination over the senses is peculiarly observable in the perpetual disposition of mankind to suppose that they *see* what they *know*, and *vice versa* in their not seeing what they do not know." That the mere possession of eyes is all that is essential to actual perception is again disproved by the thousands of cold unobservant bats, who, wilfully and stupidly blind to all the spiritual truths and poetical loveliness of nature, only look at a tree in order that they may not run against it, and never gaze upon the changeful loveliness of shape and hue displayed in the glorious clouds, save to see whether they had better leave their umbrellas at home or not.

Without pursuing this portion of my subject further, I think we may now conclude that the only real standard of entire truthfulness being the educated and carefully-trained mind—or, if you please, eye—of the truly great artist, it is to the works of such, and to the school of such, we photographers, who desire to be real artists, should first bend our steps. We have in this country many public exhibitions of the works of eminent masters in art, and our great English landscape painters are allowed to take among such the very highest rank. Let us, therefore, study their works in the public galleries, and seek instruction in that grand old school—kept by good Dame Nature—in which they, in humble earnestness, first set up their easels.

But let us go and study the works of these eminent masters with *open eyes, not blindly.*

Truthfulness is not always the painter's standard, and in many great modern paintings, few, if any, traces can be discerned of such a purpose having been contemplated by the artist. Where this is the case, much as these productions may be admired, and universal as the recognition of their beauties may be among professional critics, I think they might with greater correctness be designated scenic, or artistic, or decorative paintings, than pass under the descriptive title of an art of which they possess so few properties. We, my dear fellow student, must not seek out such pictures as these, or we shall grow bewildered and disheartened in a very short time: they are no studies for us. The photographer's teachers must be the glorious and universally extolled works of those great old and modern masters who followed, or follow, reverently and with humble earnestnes, in the wake of nature. For this work we have the proper tools: for the other work we have none.

For the reasons above given I therefore urge that the earlier studies of a young artist-photographer should not be confined to the picture galleries, but should be equally divided between these and that great school of nature in which such pictures were produced.

I do not say that the pictures I have described as unfit for our study, *as photographers*, possess nothing which can justify the world-wide admiration they may have won; far, very far, from it. But regarding the purpose of landscape art as being the repre-

sentation of the grand or beautiful objects or phenomena of natural scenery, I am not willing to accept the means for the end; to take abstract beauty of form, or harmony of colour, and a strict adherence to the rules of mere artistic effect, as substitutes for the specific object and purpose of landscape art.

Suppose we desire an architectural perspective picture, to represent the form and details of some structure, according to the dimensions of its several parts, and in their relative proportions as seen in their respective places, and more or less receding distances. Suppose, instead of giving us such a picture, the draughtsman produces a magnificent and illusive combination of the forms and colours of some building in which so much is left to the imagination of the individual as that individual's more or less cultivated imaginative faculties might as easily supply for himself upon the stained and discoloured surface of an old wainscoat, or in the glowing embers of a sea-coal fire: now, although a certain school of art-critics might admire the latter, none of them would accept it as fairly representing the thing originally desired. And thus with myself and a so-called landscape which, whether from the purpose of a painter or the faults of a photographer, is not a truthful production.

Excuse me, if I appear to urge this principle as involving consequences of more importance than at a first glance is likely to be inferred from it; but when we reflect that in any pursuit whatsoever perfection consists in accomplishing the object and purpose intended, it will be evident that the nearest possible approximation to truthfulness necessarily constitutes the highest excellence attainable in landscape art. Secondary purposes and aims, independent of the main intention, may (as I shall hereafter show) very properly co-exist and aid in enhancing the beauty and value of your performance; but these must be kept subordinate and auxiliary to the more legitimate end, and never be permitted to push it from its place. Set up truthfulness as your standard—not the partial truthfulness which dwells in the undue prominence of minute detail, but real and entire truthfulness—and I am sure in its attainment will be found such excellence as shall raise our art to a position yet undreamt of.

Let us see how far we may meet this primary requirement in the use of our means as photographers. And first let us look to our lens.

Whatever may be said of the various combinations of glasses used for other pictorial purposes, we may assert, as a rule, that the images given by really good view lenses when in competent hands very nearly approach perfection. A certain amount of distortion does doubtless exist, but this, in an ordinary landscape view, is so small as to escape observation. The amount of definition and the "depth" of definition given—to say nothing of "focus," for fear of the mathematicians—may vary in the productions of different makers; but errors in this matter are more frequently traceable to the want of pictorial knowledge in the operator than to the erroneous judgment of the optician. Many use a lens as if requiring no management it was impossible to mismanage it; and many more, though knowing perfectly well how to manage a lens, yet *purposely* mismanage it most woefully. So much has been written and said about distortion and its causes it would be the repetition of "a twice-told tale" to write to you about this matter; but, with reference to "depth of definition" I must say just a few words.

The great charm of atmospherical truth in a picture is that it represents space, that it enables the eye to range over the miles of surface represented, and even seems to lead us out beyond the extreme verge of the horizon. It is not sufficient that mere relief is obtained, that objects do not appear to adhere to each other—mere contrast of light against dark or dark against light will give this—but this is not aërial perspective. We ought to *feel* the presence of the infinite seeming atmosphere, and recognise at a glance its character; whether humid and partially opaque with the dews and vapours of rising or descending day, or clearly transparent, or loaded with the warm and golden particles of direct sunlight—in short, in all its various appearances, the presence of air should give life and soul to our pictures. Without this perfect truthfulness is impossible.

Aërial perspective is so often violated in photographic landscapes chiefly because its importance is not recognised, or, in other words, because the eye of the photographer has not been educated to perceive it. The Chinese artist aims at truthfulness, but, never recognising perspective of any kind, he too never produces it; and we know how his pictures, as representing an extreme case, are estimated. The most frequent cause of the absence of atmospheric effect undoubtedly is the use of too small a stop in connexion with the lens, by which means an undue amount of definition is carried into the distance; but there are other faults which have a similar tendency. Too much intensity in a negative destroys the soft and delicate aërial tints, and the more subtle gradations of tone and distance; and this intensity may, of course, be traceable either to collodion, bath, or developer. The want of a sky, the substitution of white paper for the same, or the inharmonious tone or character of a printed-in sky, may also destroy the appearance of atmospherical truth. A lens which does not give sufficient depth of focus, again, will exaggerate the effect of aërial perspective. Developing in a room which does not give you sufficient light to work by may also injure your view in this respect, inasmuch as not perceiving when the more tender valuable tints "which shun the careless eye" are secured, by slightly over-developing you lose them altogether. For all these errors there is but one remedy, viz., the education of the eye—the necessity for which it has been my chief aim to show in this the second epistle of your sincere friend and fellow-student,

ALFRED H. WALL.

Exhibition.

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF PARIS,

CONSIDERED FROM AN ENGLISH POINT OF VIEW.

(Communicated.)

This Exhibition is a very important one, not only as regards quantity, but quality. It contains more than thirteen hundred specimens, produced by one hundred and fifty photographers of all countries, those of France naturally forming the large majority. About a hundred and twenty of the exhibitors are French, nine or ten are English, while almost every country in Europe is represented by one or more. Egypt on one hand, and Peru on the other, has each contributed its mite; and the only important country we find totally unrepresented is the United States of America. The Exhibition occupies a corner of the Palais de l'Industrie, in the Champs Elysees, and, as the present is the season when many Englishmen make trips to Paris, we think it right to notice it somewhat in detail. There are photographers who touch up their proofs—at least so says rumour—and the jury of admission would almost lead one to imagine that some of the aforesaid had, by mistake of course, attached the word *untouched* to their productions, for at the back of the title-page of the catalogue we find the following useful hint:—"The jury has rigorously caused to be effaced the word *untouched* from all proofs which are not completely exempt."

The catalogue is printed in alphabetical order; and as the photographs are, as nearly as possible, arranged in the same manner, we think it best to follow in the same course.

Conspicuous in the room and at the head of the catalogue stands the name of an eminent amateur—the Count Olympe Aguado. His contributions are remarkable, although not numerous. They are principally cattle and farm-house or rural views, and several of them are original studies from nature admirably enlarged by the Woodward apparatus. The portrait of a pet horse or other animal as carefully rendered as are those of M. Aguado is a very pleasing possession.

M. Louis Angerer, of Vienna, contributes a large number of excellent portraits, mostly full-length cabinet pictures, which, besides their artistic qualities, derive an additional interest from the celebrity of the originals. Amongst these are the Imperial lady who is now seeking health in the Island of Corfu, Comte Jean de Waldstein and Comte Schlick, in highly picturesque national costume. M. Angerer also exhibits an admirable *View of Ischl*, *The Palais Schlick*, and the *Salon de Diomabad*. If these are not much above the average of Viennese photography the art must have been pretty well studied in Austria.

Mr. Thomas Annan, of Glasgow, exhibits three very excellent views in Scotland, *The Inverness Cascade on the Banks of Loch Lomond*, *Aberfoyle*, and the *Sources of the Forth*.

M. Baldus has a panorama of Paris extending to 200°, which gives an admirable *coup d'œil* of the renovated city, and especially of the Tuilleries and Louvre. Some, if not all, of the views of which it is composed have been published, and therefore do not call for anything more than general high commendation. His views in Dauphiny, Chamounix, and the Mer de Glace also deserve high praise: they are both solid and brilliant.

M. Bertsch exhibits five views enlarged by means of his heliographic megascope. Four of these are in France; the fifth and most remarkable is from one of M. Ferrier's admirable *clichés*, and represents the *Pavilion of the Court of the Lions of the Alhambra*, with all its exquisite enrichments, in a most remarkable manner.

Mr. R. J. Bingham, who, though an Englishman, practises here, seems to have obtained almost a monopoly of the photography of art reproductions, and has one of the most important collections in the Exhibition. It includes more than fifty gems of modern art. Some of these beautiful chemical pictures are already well known, such as Meissonier's *Amateurs* and *Scene in a Cabaret*, Horace Vernet's remarkable little picture, *Chien de temps* (two soldiers and a dog in a drenching rain), Yvon's *Scenes in the Crimea*, Cabanel's charming *Florentine Poet*, Ary Scheffer's *Francesca* and *Paola de Rimini*, for which no word of eulogium is needed. Besides these there are many not yet known to the world, and of which the originals hung but the other day in the biennial Exhibition of Paintings and Sculpture under the same roof, such as Gerome's *Rembrandt*. Mr. Bingham also exhibits beautiful photographs of Raphael's *Belle Jardinière*, and of the *Supper in Canaan* and *Jesus at the house of Simon*, by Paul Veronese, and a small collection of Raphael's sketches and drawings in the gallery of the Louvre. In all he exhibits more than sixty specimens, and some of his more recent works prove that he is still improving. We trust that the London International Exhibition of next year will afford Englishmen the opportunity of seeing this admirable collection with augmentations.

The works of the brothers Bisson, of this city, are well known to amateurs, and most of our readers will have, doubtless, seen an account in this Journal recently of an ascent of Mont Blanc, by one of these gentlemen, for photographic purposes, and of the difficulties with which he and his companions had to contend. One of the pictures obtained is here exhibited, and is a very fine specimen, exhibiting the features of the monarch of mountains, which are almost beyond the reach of any other form of art. Several of M. Bisson's other productions are akin to this; and, amongst the most remarkable, are the Pic du Midi, a snow-drift on Mont Blanc, caught in the very midst of its career, and two of the Valley of Chamounix.

A series of maps, amplified and diminished, executed by M. Bobin, photographer attached to the Bureau of the Minister of War, shows how the French government has made use of the photographic art. Amongst the rest we find specimens of enlarged maps of Austria and Sardinia, prepared for the late Italian campaign.

Mr. Blanford Caldesi's collection of pictures in the National Gallery of London, of the Elgin marbles, and of the gems in Her Majesty's collection at Buckingham Palace, represent worthily the condition of art-photography in England, and attract great attention here, where most of them and of their originals are but little known to the public, and even to the artistic world at large.

M. Claudet's portraits take rank with the first of their class, and he has sent some excellent specimens; but other well-known English photographers should have been represented also.

FRANCIS'S INDIA-RUBBER FIELD BATH.

In the number of THE BRITISH JOURNAL OF PHOTOGRAPHY for September 1st, 1860, a bath of extreme lightness, made of thin mahogany, lined with pure sheet India-rubber, was described in a notice of Mr. Francis's establishment in "LETTERS TO A PHOTOGRAPHIC FRIEND." We have lately observed in the pages of a contemporary that a Mr. Leo Daft, in commenting on a *recent* description by the editor of this neat and ingenious arrangement, claims the invention, as he described in one of the February numbers of the same Journal a method of making a bath for nitrate of silver solution, out of sheet India-rubber. In justice to Mr. Francis we may state that we saw an India-rubber bath of his construction in the hands of Mr. Cocke, the photographer, more than twelve months ago. Independently of this the arrangement is quite different from that recommended by Mr. Daft. Mr. Francis cements the sheet rubber down over the entire internal surfaces of the side, end, and bottom pieces: the end and bottom strips are placed between the side pieces, and are then screwed in position; the India-rubber between the joints acting as a washer, makes any cementing quite unnecessary. This is not only lighter, but occupies less space than any other form of portable bath we are acquainted with. There is, however, one drawback, and that is it must be kept unexposed to light; for it is found that a moist surface of India-rubber exposed to light becomes corroded, but if kept in the dark it is not attacked. S. H.

We are glad to find that an ardent photographer and an old subscriber to this Journal, the Rev. Dr. Thomson, Provost of Queen's College, Oxford, has been elevated to the see of Gloucester, rendered vacant by the translation of the Right Rev. Dr. Baring to the see of Durham.

Meetings of Societies.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE fortnightly meeting of this Society was held on the 21st ult.,—the chair being occupied by George H. Slight, Esq., Vice-President.

After the minutes of last meeting had been read,

The SECRETARY said that, within the last week, the Society had sustained a great loss by the death of one of its most devoted members, and an enthusiastic photographer—Dr. Easton. It was only a fortnight since, along with Mr. Slight and himself, Dr. Easton had been appointed a committee to arrange for a Society excursion to Aberdour; and the Friday following he had been at his (the Secretary's) place of business to all appearance in the most perfect health and spirits, and looking forward to the excursion with high anticipations of pleasure. The following morning he was laid prostrate with scarlet fever, and in four days was dead. As the life of their late friend and fellow-member was an eventful one, he (the Secretary) would read to the meeting a brief account of a few of the stirring incidents in Dr. Easton's career:—Though Dr. Easton did not occupy any public or prominent position in our city, he was, in every sense of the phrase, a man of mark. After having passed through the medical *curriculum*, he entered the navy, and served as assistant-surgeon on board Admiral Stopford's ship during the memorable Syrian naval campaign of 1840-41. On its termination he was promoted to the rank of surgeon, and spent three years in the *Sealark*, twelve guns, on the west coast of Africa. Without referring further in detail to his naval career, we may mention his appointment as surgeon to the *Cossack*, twenty-one guns, which formed one of Sir Charles Napier's Baltic fleet during the Russian war. Here it was his fate to be connected with that event so well-known by the name of the "Hango massacre." As many will recollect, a boat's crew left the *Cossack* for Hango, for the purpose of setting on shore some prisoners that had been taken out of a captured Finnish vessel. Dr. Easton accompanied Lieutenant Geneste, who had charge of the boat. Scarcely had they landed on the jetty, with a flag of truce at their head, when a murderous fire was opened on them by a hundred Russian soldiers, who, up to that time, had been kept concealed. Several of the *Cossack's* crew, as well as of the Finnish prisoners, were shot down in cold blood. The survivors were taken prisoners, and transferred separately to various Russian prisons. Dr. Easton was conveyed first to Helsingfors, thence to St. Petersburgh, and finally to Vladimir, about 150 miles from Moscow. If, previously, he had been subjected to all the rigours of military imprisonment, an agreeable change awaited him at Vladimir. The Count Annenkoff, civil and military governor of the province, treated the Doctor with the utmost kindness and courtesy, and during his residence at Vladimir he was more the guest and friend of the Governor than a prisoner of war under his control. When, after some months, he left for Odessa to be exchanged, he departed laden with many presents from the Governor and his family, which showed the estimation in which they held their captive. Among these were a highly-finished miniature portrait of the Empress Anne, presented by that sovereign to one of the Annenkoff family, and a snuff-box which had belonged to the famous Russian General, Suwarrow. Once more a free man on board a British vessel of war at Odessa, he soon afterwards had an opportunity of surveying the ruins of Sebastopol, after its evacuation by the Russian armies. Returning to Scotland, Dr. Easton had but a short time to spend with his friends, when he was appointed to the *Pembroke*, 51 guns, stationed at Harwich for the training of the coast-guard. When his three years' term of service expired he returned to Edinburgh, to which, though not the place of his birth, he was much attached, from the days when, as a boy, he attended the High School. His loss will be severely felt by a very large circle of friends and acquaintances, who could with difficulty tell which most to admire—his upright, honest integrity of character, or his ever genial, hearty good humour.

Some of the members gave an account of their experiences at the excursion to Aberdour on Saturday, and several pictures taken on that occasion were exhibited. Those by what is known as yet as the "hot-water process" and Fothergill's process were considered best. The members generally had enjoyed themselves so thoroughly that another excursion to Roslin was organised for Saturday in the following week. It was also resolved that a small prize be awarded to the producer of the best negative on that occasion, the pictures to be produced at the meeting on the following Wednesday.

An exhibition of cameras and other pieces of apparatus then took place. A three-inch patent aplantic lens, by Grubb, exhibited by Mr. Nicol, was stated by him to produce absolutely straight marginal lines, while its general defining powers were very excellent. One of Dallmeyer's stereoscopic cameras (costing £11 5s.) was much admired for its beautiful finish, although some of the members thought that for photographic purposes it was needlessly fine.

The business for next meeting was stated to be a paper by Mr. Slight, *On the Hot Water Process*, which would be illustrated by the preparation and development of several plates. The meeting then separated.

We learn that the authorities at the South Kensington Museum have altogether given up photographic printing. The deplorable waste and quantity of "failures" made by the sappers and miners have been too much even for them.

Photographic Olla Podrida.

ASTRO-PHOTOGRAPHY.—Mr. John A. Whipple, who so successfully photographed Donati's comet and other heavenly bodies, reports that the actinic power of the comet that unexpectedly made its appearance during July was extremely feeble, and that it was hardly possible to secure an impression on the most sensitive plate. Compared with the actinic power of the moon, or even fixed stars of the third or fourth magnitude, it was not one thousandth part so active.

NITRATE OF SILVER.—M. Grenier suggests a new method for the preparation of nitrate of silver from impure metal. Dissolve the silver in nitric acid, when almost neutral and cold, add solution of sulphate of soda to produce a precipitate of sulphate of silver, which is to be washed in distilled water. Digest with heat the washed precipitate, to which has been added a proper proportion of nitrate of baryta: this produces sulphate of baryta, which is separated by filtration, and nitrate of silver, which is separated by crystallisation. As, however, nitrate of silver has a great tendency to combine with alkaline nitrates, it is questionable whether it would not probably be contaminated by nitrate of baryta.

HOT DEVELOPERS.—MM. Roman and Ferrier recommend that developers should be applied to the film hot, especially in the production of instantaneous views.

HUMBOLDT'S PHOTOGRAPHS.—At the recent sale in Berlin of Baron Humboldt's collections, a series of 47 views of scenery and natural objects in Mexico and Venezuela, taken expressly by M. Rosti, in 1857-8, produced 100 thalers (= £15); the portrait of Aimé Bonpland, the naturalist, taken at Buénos-Ayres, and presented to his friend and travelling companion, Humboldt, produced 31 thalers (=£4 13s.). The portrait of the sculptor Rauch, photographs by Lehmann of the mural paintings of the Galerie des Fêtes in the Hotel de Ville de Paris, and fifty-six views by Legray, likewise produced good prices.

ALBUMENISED PAPER.—M. Cordier advises that the albumenised surface of freshly-prepared positive paper should be coagulated by immersing the paper in the strongest and purest alcohol procurable. By this method the albumen is not removed in the subsequent immersions in water, as is the case when it is coagulated by dilute nitric acid, or by employing a temperature of 212°. M. Cordier sensitises albumenised paper thus prepared on a bath of crystallised nitrate of silver of only 5 per cent., as this is not strong enough to attack the coagulated albumen, but, on the contrary, keeps it in good condition and with a brilliant surface.

A HINT TO ALBUMINISERS.—What can you do with the yolks of your eggs? Make them into cheesecakes that will be pronounced unrivalled. Dissolve a quarter of a pound of butter in a basin placed on the hob, stir in a quarter of a pound of pounded lump sugar, and beat well together; then add the yolks of three eggs that have previously been well beaten; beat up all together thoroughly; throw in half of a grated nutmeg and a pinch of salt, stir, and *lastly* add the juice of two fine-flavoured lemons and the rind of one lemon that has been peeled very thin; beat all up together thoroughly, and pour into a dish lined with puff-paste, and bake for about twenty minutes. This is one of the pleasantest "bye-products" we are acquainted with in the economics of manufacturing photography. Try it!

TO KEEP WATER PURE.—Dr. J. V. C. Smith, a traveller in tropical regions, states that if water be preserved in India-rubber bags, and kept closely corked, it retains its purity even if exposed to the direct rays of the sun for periods extending over twenty-one days to six weeks. This material seems to prevent the fermentive process of what sailors call "working."

THE TANNIN PROCESS.—To prevent the possibility of the film splitting after it has been fixed with "hypo.," a contemporary recommends that after a thorough washing, and whilst still wet, it should be coated with a weak solution of gum arabic: it may then be dried and varnished.

STOP-PER-EASER!—It is a frequent annoyance in the laboratory to find the stoppers of bottles that contain caustic solutions firmly fixed, through the corrosion of the glass: greasing is inefficient, and at the same time objectionable, as fatty acids may be introduced into the solution. A contributor to a scientific German journal states that if stoppers are lubricated with paraffine the evil is perfectly remedied. S. H.

Notes of the Month.

THE London season has long been over, and an unruffled calm prevails throughout the world of art. Exhibitions closed, and streets deserted, the very cab-horses hang their heads and doze, and allow the flies to bite and the sun to burn unheeded. Artists and photographers are most of them "over the hills and far away," getting pictures for next season—not without a regardful eye to the enhanced importance of the coming year of 1862. It is said that the French will be found more formidable rivals than has hitherto been supposed, and that they will come out in great force; and M. Silvy is going to annihilate all others.

The official correspondence between the Council of the Photographic Society and Her Majesty's Commissioners having terminated, it behoves photographers to decide upon what course they will pursue—whether to aid in getting up an independent Exhibition, or to exhibit in the building under protest, or to abstain from exhibiting at all—as the time for receiving applications for space will expire, we believe, on the 30th September.

The Commissioners have, also, in accepting the tender of a foreign house for the right of photographing the building up to the 12th February, 1862 (when a fresh tender will be made), recognised a very questionable principle in such matters. The invitation for tenders was advertised in the columns of *The Times*, and the conditions of tender were open for inspection at the Commissioners' offices, 454, West Strand. Several eminent London houses tendered not insignificant sums; but a foreign tender —offering not any stated sum, but offering to *double* the highest tender sent in by any firm whatever—obtained the license. Such a principle once admitted, and allowed to pass into a precedent, will make it useless for anyone to make estimates for tendering, as it will admit of any degree of modification, and no one would know but every tender might be met by one offering five, or ten, or twenty per cent. above the highest sent in. *This* tender for license being comparatively an unimportant one to the subsequent right of photographing the building in its more advanced state, those who have by this means obtained the license will have superior opportunities of seeing how far it may be politic to offer a large sum for the more important and subsequent license.

Another result of photographic enterprise is announced in the fact of Messrs. Negretti and Zambra having connected their several establishments in Cornhill, Regent Street, and Hatton Garden, London, by means of a private telegraphic wire. The London Stereoscopic Company have also lately completed a telegraphic communication between their establishment in Cheapside and their photographic printing establishment in Surrey. The enormous demand for *cartes de visite* has necessitated this instantaneous mode of communication. The public can now in a case of emergency secure a large number of pictures immediately the want is made known. As a proof of this, only a few days ago a man who had absconded with an enormous amount of money, but whose negative the company had taken, was known in a short time after nearly all over Europe. The telegraph gave his name and number, and by that night's post some dozens were ready for the police authorities to send over the world.

That most offensive phrase, or rather parisitic excrescence, of photography, "shilling-portraiture," is just now occupying some share of public attention. Recent cases brought before the police courts have stirred up some of the lowest depths of this filthy cesspool, and the odour emitted is anything but agreeable. That this particular "walk of art" is one of the most popular refuges for the destitute—destitute morally and intellectually—is too well known to need expatiating upon here. That the class who practise it are amongst the most degraded of the "fallen" is a fact patent enough. That they have enough of art to turn the well-deserved popularity of photography to account is not much to be wondered at, when they can by a cheap bait inveigle people into their dens in the first place, and by the exercise of a little legal ruffianism afterwards extract three times the sum expected. That this is not an occasional thing, but is systematically and regularly practised, is another well-ascertained fact. The well-known reluctance of "victims" to seek redress in a public court of justice allows such practices to be daily perpetrated with impunity. The danger would be much reduced if people would abide by one simple rule, viz., never to enter any place where a doorsman or touter is kept, because no respectable photographer ever employs such an animal. We should much rejoice to see some hearty, united effort made to put down this abomination. To no one is the class so offensive and humiliating as to photographers themselves, and it aids more than anything beside to associate photography in the public mind with everything that is low and scampish. S. T.

Foreign Correspondence.

Paris, August 26th, 1861.

M. Edouard Delessert, who is still busily occupied with his amplification, has just invented a contrivance for obviating the inconvenience which the motion of the sun causes to the operator. In the usual construction of the operating-room, the moment comes when the outside mirror, which is intended to receive the solar rays and reflect them onwards to the condenser, is no longer able to do so, on account of the motion of the sun, or, to speak more correctly, of the earth. This necessitates the interruption of the operation. M. Delessert has laid down a circular rail on the ground or terrace where his operating-room is established. The construction which serves as an operating-room, and which resembles a large wooden box, is furnished with four wheels, on pivots, which are adapted to the iron circle. The operating-room can thus make a complete revolution. A system of ropes and pulleys, and four supports, allow the operator inside to turn the whole concern by means of a crank in the centre. In this manner the operating-room and everything belonging to it follows the motion of the sun, and it only remains to give the necessary upward or downward movement to the reflector, which is fastened by the bottom.

Mr. Petschler, of Manchester, whose method has been published in The British Journal of Photography, showed me, when he was passing through Paris, a series of excellent pictures obtained upon glasses prepared a long time beforehand. They are principally views taken in Derbyshire, well finished in their details, delicate in their half-tints, and harmonious. My friend, M. Paul Liesegang, has just communicated to me the result of different experiments which he has made with this same process. The glasses he made use of had been prepared more than a month.

At five o'clock in the afternoon, with a simple objective of Lerebours', with diaphragm, he obtained a very vigorous and finished picture after fifteen minutes' exposure. With Dallmeyer's triplet lens, No. 2, the exposure is reduced to six or eight minutes. Out of ten glasses, one only, the first, gave a *cliché* somewhat unsatisfactory, which, of course, is easily understood.

M. Zantedeschi, Professor of the University of Padua, has written on the subject of Mr. Crookes's spectroscope, and to claim priority in the observations for which that instrument is intended. The labours of the Italian savant go back to 1857 and 1852, and were published in those years. They describe his spectrometer at length.

M. Poitevin's charcoal process is producing excellent results, which are all the more satisfactory, as improvements are already presenting themselves. I have before my eyes two of M. Joly Grangedor's pictures, printed by this process, and which are far superior to those obtained from the same *clichés* by means of chloride of silver. There is more softness in the tones and brilliancy in the lights on account of the contrast, and especially there is more colour.

M. Bobin has lately reproduced, by this same process, some maps which exhibit extraordinary finish. Different kinds of charcoal are being studied, and by means of mixtures various tints are obtained. The charcoal of sugar is that which gives the tones which are the most similar to those of photography.

MM. Ferrier (father and son) and Soulier have just brought out a collection of stereoscopic views, taken in China, during the expedition, by Colonel Dupin, attached to the French staff. Although executed by an amatuer, these pictures are very interesting. One of them, which has not succeeded, presents a very amusing effect. It represents two mandarins seated side by side. The Colonel operated with a single camera, and, while he was shifting the apparatus after taking the first image, the two personages moved—one raised his head, the other bent his head down sideways. If you look at these portraits in the stereoscope, and alternately and rapidly open and shut both your eyes, the heads appear to move as if the mandarins were beating time. The illusion is complete. I should not be astonished to see certain photographers, who seek the new rather than the beautiful, take up this idea, and represent moving photographs, by means of a screen arranged in the interior of the apparatus. I relinquish to them my idea, without even intending to claim priority.

ERNEST LACAN.

New York, August 14.

We have recently been making trials of gun-cotton and collodion, in the hope of developing new uses or properties. These wonderful substances have nearly been neglected by the scientific and practical world. Chemists tell us, with much misgiving and doubt, of their precise constitution and properties; and their only undoubted useful application in the arts is to the photographic picture. Our recent experiments, however, will prove a sufficient stimulus to the inventive talent, and I have little doubt that gun-cotton will soon find employment in a hundred arts.

Every photographer, of course, has observed how beautifully transparent and even the collodion film is when formed on glass. Now, if this film be made from pyroxyline of the most suitable character, it is exceedingly tough; indeed, I know of no organic substance which will resist a greater tensive force. Also, by the addition of gutta-percha, rubber, resins, &c., a greater range of elasticity, pliability, hardness, &c., may be secured. The collodion skin may also be made of any desired thickness, and, provided the cotton from which the pyroxyline is produced be properly cleaned and bleached it will be colourless as well as transparent, or any desired colour or opacity may be given to it. I have thus made sheets of dried collodion over an inch in thickness. Out of such a mass it is easy, with proper tools, to work any desired form. The dried collodion possesses the sensible properties of very many of the most valuable materials used in the arts: it may be substituted for ivory, horn, wood, glass, &c., and in many cases it will have a decided advantage over any of them. "But," says the timid gent. of the old school, "wouldn't your gun-cotton statuary, buttons, paper, and billiard balls, explode?" In reply, I assure our friend that we will really change all that.

The experiments on dried collodion were suggested in a successful attempt to prepare from it fuses for shells to be fired from rifled cannon. It is well known that the ordinary gunpowder fuses are quite unreliable, and especially when fired from a rifled cannon—the obvious reason being the uneven packing of the powder and the crushing by the shock of the discharge. Dried collodion is perfectly homogeneous, and its toughness will protect the fuse in the discharge.

Several photographers who followed our army to the battle of Bull's Run were completely routed. In the inglorious retreat they abandoned and threw away everything which would encumber their flight. Thus, by a narrow chance, did we lose the photographs of a great battle.

I have read the fifth memoir of M. de St. Victor, and am still unable to discover anything about his researches more conspicuous than the persistent activity of one groping in the dark. His ignoring the critics and the modern progress of science is truly refreshing for these dog days. I wonder what M. Niépce's notions are of the nature of light. I would prescribe for such a case as his a study of the modern doctrine of physical forces, of the laws of chemical affinity, and of the phenomena of the attraction of substances for each other where a new chemical compound is not formed—a category which begins, perhaps, with the attraction of platinum for hydrogen.

CHARLES A. SEELY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

MR. J. CRAMB'S CAMERAS.

To the Editor.

Sir,—My attention has been called to a statement in the report of the proceedings of the Manchester Photographic Society regarding my cameras. I think Mr. Sidebotham is mistaken if he supposes I claim or have ever claimed the invention of these cameras. In The British Journal of Photography for the 1st August they are described as being those *used* by me. There is not a word about *invention*. Again, in the first Palestine article I distinctly stated that the principle of my stereo. cameras was made known through the columns of the *Journal of the Photographic Society* of London;* but that I had so much improved them that I might claim them as an invention. But I am too fast, perhaps. I am yet unaware what part of my camera arrangement I am charged by Mr. Dancer with plagiarising from him. I must plead total ignorance of any camera put forth by that gentleman having any resemblance to mine.

Had I known Mr. Sidebotham's address I would have written to him directly for this information, by which means I could have more distinctly addressed myself to the charge made against me.

Except the camera of Mr. Bradley—which I think I have so improved as to make it a workable thing—I have never seen or heard of one *without* slides. The very same cameras I had in the Holy Land I have used for now going on *five* years. I have ever been forward to profess that

* *Journal of the Photographic Society*, vol. iii., p. 129.

I had copied the design, and from whom. I am afraid Mr. Sidebotham does not understand my beautifully simple plan, else he never could confound it with anything I have ever seen of his friend, Mr. Dancer's.

I shall, however, be glad to know more definitely with what I am charged, either through the Journal or by post.—Yours truly,

67, *West Nile Street, Glasgow,* JOHN CRAMB.
August 26*th*, 1861.

PHEESIC FOR "PHOTOGRAPHIC NOTES."

DOSE THE THIRD.

To the YEDDITUR.

"Greenwood! thou art the man!"*

SIR,—O deerie me! but I really thocht I wad hae split a blude-vessel when I got *that* far throo wi' oor frien' Tam's reply. Anither sic article wad be the verra death o' me. An' sae! it's no *me* ava that's writin' just noo, but it's Maister Greenwood, o' Liverpool; for disna Tammas (wha is the verra personification o' prudence, an' modesty, an' a' that's gude, truth included) tell us in his last *Notes* that the pheesic disna come frae a Scotsman ava, but "Greenwood, thou art the man!" But, true tae his principles, he says that if it's no Maister Greenwood, it maun be the ponderous Yedditur himsel', seemin' tae think that there's no ither twa in the haill creation wha could hae wasted their time in readin' his *Notes* wi' the sam care "Auld Lens" has bestowed on them. Noo *ponderous* means weighty—a qualification whilk I suppose he attaches to the Yedditur's opinions: no fear o' its being attached to his ain.

Weel, I *hae* read a gey hantle o' his *Notes* within the last twa or three weeks, an' I'm no at a' unwillin' tae gie your readers the benefit o' my readins; but no just the noo, for I hae ither fish tae fry—or rather tae *roast;* but when that's dune, I'll maybe gie them an entertainment noos an' thans by settin' before them a dish o' "Cream o' the *Notes.*" In his last issue, my frien' Tam is wrigglin' just for a' the warld like a muckle conger eel, or a skate that's pinned by a leister throo the guts: there he tosses, an' there he twists, just till I choose tae set him free. Muckle better will it be for him tae lie still an' bear the rod wi' patience an' resignation: his torture will be a' the less. "Greenwood, thou art the man!" Ha, ha, ha! thou art the man *this* week; but neist week it will be some ither bodie, an' the week after anither bodie a'thegither, for oor frien' Tammas is no at a' particular in that way. An' hoo div ye think he maks it oot that "Auld Lens" is nae ither than Maister Greenwood, o' Liverpool? Just this way:—When oor frien' Tammas *applied tae Maister Greenwood* (for, accordin' tae a' parties, Maister Greenwood never applied tae him) tae get hissel' made yedditur o' the BRITISH, and was rejected, frae that time forward he was aye lettin' drive at the BRITISH whenever he got a hair tae mak a tether o'. Weel, when the bodie grumbles at me for readin' *his Notes* ower particularly, he forgets that that is a virtue, an' ane that he himsel' sairly neglects, else he wad hae seen a *haill accoont o' the transaction (which he noo supposes tae hae been kent tae nane but Maister Greenwood) in the* BRITISH, Vol. VI., No. 88, for February 15th, 1859, which is commented on in five columns o' his ain *Notes* for March 1st, 1859; sae that, if the doited bodie thinks this queer affair cam afore the public in my last dose, he is, as *Punch* says, "werry much mistook." The transaction has been public property for aboon twa years. A'thegither it forms ane o' the best illustrations o' the fox and the grapes I hae yet seen.

Anither phase o' the sam fable may be seen when Tammas misca's the young ignoramuses wha write tae the BRITISH for information. Whaur better could they apply? He says:—"Is it possible that photography should present so strange a piece of statistics as this—that certain journalists should be regularly beset by a parcel of blockheads requiring elementary information? &c., &c. Look at the good, honest, straightforward *Journal of the Photographic Society:* you see none of this nonsense there, neither are *we* troubled with this crew of everlasting muddlers," &c. Weel, ane or twa remarks will dismiss a' this fine an' indignant writin'. First: the Jersey *Notes* were got up, I understood, wi' the express intention o' helpin' on young ignoramuses. Secondly: in its palmy days, some years ago, it used tae hae as muckle as thirteen columns o' the correspondence o' the "everlasting muddlers and parcel of blockheads requiring information." In the present number for August 15th, the whole correspondence is comprised in *twa* letters, ane of whilk is written and signed by Tammas himsel'. Somethin' gey an' like tae a case o' soor grapes that!

As it might appear ill-natured were I to gie the reasons for this fallin' off, I'll no say onythin' mair aboot it; but I canna help remarkin' that I fear "ichabod" may noo be written on it. Oor frien' Tam says, in the course o' his long ramblin' reply to "Auld Lens:"—"But the charge of inconsistency must not be passed over," &c., &c. "In our optical articles we are not aware of any flaw that has ever been pointed out in the reasoning, or any statement that is opposed to fact. * * * In the main we have not been *far* wrong, and cannot certainly admit the charge of *gross* inconsistency." Far far be it frae me tae say he ever said or did a wrang thing in a' his life—that wad be a moral impossibility; but for the benefit o' thick-skulled mortals wha' winna agree wi' me in admittin' his absolute infallibility, he will maybe try and explain twa or three apparent (no *real*—of coorse not) contradictions. I am verra weel aware that he closes his last article by sayin' he disna' mean tae tak ony mair notes o' the like o' me; but I dinna mean tae let him aff that way: he'll no part frae me quite sae sune yet. An', moreover, he should be thankfu' tae me, for I'm bringin' him into notice, an' that's a thing he winna object tae, I'm sure, and which he sadly needs.

Weel, as I said, I'll noo favour him by giein' him an opportunity o' explainin' twa or three o' his statements; an' that he may be at nae great loss, Ise gie him day and date for them.

Lang syne (in the London Society's Journal for Oct., 1854), when predictin' the doonfa' o' collodion, which he there terms a "delusion," he says:—"It requires some courage in an humble individual to predict thus much of a popular favourite in the zenith of its glory; but I shall be obliged to you, sir, if you will give this prediction a place in your columns, and time will show how far I am right or wrong. I speak *deliberately and advisedly, and from a practical knowledge of all the processes.* * * * * Positives in collodion *have been entirely exploded.* * * * I solemnly believe that the best paper work for views is *absolutely finer* than the best collodion work," &c. At that time we didna ken the chiel sae weel as we do noo, an' folk thoucht it was either written by some Johnny Raw (wha, by bunglin' in his first attempts wi' collodion, had just got the results ony sensible bodie wad hae foreseen), or maybe by some hair-brained ram-stam customer, after he had got tae his tenth tumbler. Had we kent oor frien' Tammas then, we wad hae felt nae surprise ava when he shortly afterwards began tae write in praise o' collodion, an' sune after that began tae manufacture an' sell that dirty liquid! It wad appear illnatured in me tae say it, but it really seems as if collodion (only since he began tae sell it) is to be shoved in the faces o' the readers o' his *Notes,* till he maks it a nuisance as insufferable as he made Blanquart Evrard's printing establishment, Hollingworth's paper, Pouncy's carbon printing process, or (wi' reverence be it said) the London Photographic Society, which he is noo toadyin' at sic a rate as really maks me feared something no' canny will be happenin' to its respected secretary, Dr. Diamond. The carbon process o' Mr. Pouncy suggests anither prediction oor Jersey oracle uttered in his *Notes* for April 1st (ominous day!), 1858. Speakin' o' the substitution o' carbon for silver in positive printing, he says:—"We predict that before long the matter will be taken up in earnest by the trade. * * * * In fact, the abominable process (silver printing) at present employed will be swept away, and superseded by another. Our readers may smile at these predictions, and think us too enthusiastic; but if the truth must be told, we rather pride ourselves on the PRACTICAL character of our suggestions, and assign *three months as the probable date of the fulfilment of the prediction now* (April 1st, 1858) *committed to print.*" *!!!* No' bad that ava! Odds, man, but Tam's a real clever fallow; an' if he wad come tae Glasgow I wad stan' him a tumbler in Lucky Harrower's, o' the Saut Market, an' get him tae prophesy an' predict a sma' spell o' weather fit for allooin' a puir soul tae gae doon the Clyde wi' his camera, for the weather in this quarter is unco unphotographic just noo. But it seems he prides himsel' especially on his optical articles. Ye'll no find a "flaw in his raisonin' there, nor ony statement that is opposed tae fact." It stan's tae natur' it maun be sae, for, as I hae said, he couldna mak a mistak—na, not he. It's my ain private belief that there is mair than ane B.A. and wrangler o' Cambridge stayin' at Jersey, and that they a' haud verra different opinions frae each ither, altho' they possibly tak turn aboot at the wheel o' the *Notes,* ilk ane trumpin' oot his ain opinions tae the entire disregard o' his neebour namesakes. If I am wrang in this notion, hoo else can ye reconcile the followin'? In No. 25 o' the *London,* he gies us a lang lot o' mathematical reasonin' tae pruve that a better picture can be taken wi' a sma' landscape lens without a stop than a bigger ane wi' a stop. "The real question," he says (page 97, Vol. 2), "is whether a small lens could be made to work as well as a *large one with the same sized stop.* In what follows I shall endeavour to prove that it might work *better.*" An' then follows his proofs, illustrated wi' three diagrams, which, a' in a', are aboot the maist remarkable that hae ever yet appeared in ony book, photographic or itherwise. Sic an ootrage on the optics o' oor art wasna lang in bein' resented by Grubb, Shadbolt, Goddard, an' ithers o' oor true men—lang may they be spared! Grubb in particular, after endurin' a heap o' the ill tongue which charactereeses the bodie, quietly slipped a padlock on Tam's mooth, an' *shut him up* (*vide* page 140). O, Maister Yedditur, *do* obleege me by comparin' Tammas's diagram at page 98 wi' Grubb's at page 189 o' the journal alluded tae, an' then say if he ever made ony optical statement inconsistent wi' fact. Queer eneuch, when Sir David Brewster afterwards cam oot in favour o' sma' lenses, the person wha gied him the maist ill tongue in *pruving* that big lenses were better than sma' was nae ither than oor Jersey frien' himsel'. The only thing that can be said aboot his sneers against Sir David Brewster, Brunel, Grubb, Shadbolt, Malone, an' ithers o' the sam' stamp, is, that his sneers are just worthy o' himsel'. He afterwards ate dirt pie by sayin' (*Notes,* No. 73, for April, 1859):—"*Small lenses are perfectly useless.* * * *Some years ago we committed the mistake of recommending these lenses for trial. They are of no use whatever in ordinary landscape photography,*" &c.

Without encroaching more on yer space by noticin' the scores o' minor inconsistencies, which he, in the elegant lingo o' Cambridge, wad term fibbin'—sic, for example, as sayin', in 1860, "*We maintain that a first-rate practical photographer is a better judge of a photographic lens than a practical optician,*" &c.; an' sayin', in 1861 (nae langer syne than the number in which he impertinently published the private business letters

* *Photographic Notes,* August 15th, 1861.

o' parties with whom he had naethin' tae do), "That he himself was incapable o' testin' a lens: no photographer could do it, only an optician"—little wee bouncers o' this sort I *maun* pass over—at least at present; an' I will conclude wi' a remark or twa about anither optical achievement o' his: I mean his discovery that nae lens will or can gie straught lines unless it be symmetrical. Noo, onybody that kens ought o' optics kens that tae be sic a "*thunderer*" that it scarcely is worth while tae contradict it; but frien' Tam has harped upon that string sae lang that he maybe noo believes it tae be true. If he only had been capable o' testin' a lens himsel', I wad asked him tae come tae Glasgow, whaur I wad hae let him see about half-a-dizzen lenses o' a' sizes, all o' which mak the lines *mathematically* straught, an' *there's nae mair symmetry in the lenses o' ony o' them than the fact that they're a' made o' glass* and moonted in brass.—I am yours, &c., AULD LENS.

Glasgow, August 26th, 1861.

ADHERENCE OF THE FILM IN THE TANNIN PROCESS.

To the EDITOR.

SIR,—Will you be kind enough to ask "Verdant Green," who seeks your advice in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, if he has ever tried slightly warming the glass plate immediately before pouring on the collodion? Out of several lots of stereo. plates which I have prepared by the tannin process during the last two months, adopting the above-named precaution, I have not had one which has in the slightest degree manifested any signs of film loosening or film blistering either in developing or in the after-washing and fixing. I know this is saying a great deal, when the discoverer of this beautiful dry process himself admits that the loosening of the film during development is one of its drawbacks; but it is, nevertheless, a fact, and I should much like your correspondent and others who may be annoyed in the same manner to try the plan of warming the plate before pouring on the collodion, and also to allow the film to set *well* before placing it in the silver bath.

The tannin solution I make of 10 grains of tannin to 1 oz. of water, and filter twice through paper.

The collodion I have used has been "Smith's," of Bath, with the addition of a few drops of tincture of iodine a day or two before using. Probably there are other collodions which would answer as well: I merely mention the one I am in the habit of using, because, having seen it often stated that success in the various dry processes depend so much on the peculiar quality of collodion used, I thought the question might be asked of—yours, &c., T. M. W.

August 22nd, 1861.

AWFUL IGNORANCE AND ASSURANCE.

To the EDITOR.

SIR,—How empty and how vain is human ambition! There are beings who never heard of Shakespeare, and there is at least one being to whom *I*, the celebrated, the world-renowned patentee of key-hole photography, I, PAUL PRY, am—unknown! positively and absolutely unknown! Such is fame!

The Editor of your Jersey contemporary asks, *in print* [see his last number]:—"*Who is Paul Pry?*" Fye! isn't such ignorance (in an *Editor*, too) positively awful? Really it takes one's breath away!

But what I object to is not his ignorance—that, perhaps, may be his misfortune—but it is his assurance (which is a fault) that he, after insulting nearly every photographic writer and speaker, and printing in his pages over and over again the most coarse, offensive, and uncalled-for remarks—that he, of all others, should—crouching down into his own corner, and putting up his arm to guard his lowered head—cry out because you allow some whom he has assailed to strike him with *his own weapons*, although those weapons are still unsullied by foul stains which he does not scruple to leave upon them.

This same Editor complains of certain communications in your pages, because in attacking him the writers' names are not appended. Now does this individual imagine that if I, Paul Pry, chose to belabour some sweep or dustman with my umbrella for vulgar insolence in the public streets, I should first take out my card-case, and with a polite bow request him to allow me to present him with my name before castigating him for such coarse abuse? If so he must be disappointed, and may express that disappointment in any terms his impotent anger may dictate. The only remedy for him lies in ceasing to act as a sweep or dustman, and so advancing a rightful claim to different treatment. Not that I, *Paul Pry*, have anything to do with such a suppositious case—oh, dear, no! on the contrary the only communication in which I named this individual Editor's journal, was that in which I gave it very high praise, as containing just the kind of information which I, Paul Pry, more especially and particularly desired, and most highly appreciated. But then that letter was published a very long time ago. I certainly described the contents of some journal then unknown in my last; but in that I neither named the Editor, place of publication, or title, nor gave any other descriptive particulars. If, however, this Editor has recognised the description for that of his *Notes*, and thus publicly announces the fact—why who has a better right to do so? and what better proof can be given of the great value of the last new invention of

Yours very truly, PAUL PRY., P.K.P.

Kew Rye House, August 16th.

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

ANSWERS TO CORRESPONDENTS.

OXONIENSIS.—Bell and Daldy, Fleet Street, London.

HUGH.—Had better get Major Russell's book at once.

S. F. L.—We regard such precautions as puerile in the extreme.

C. A.—You will find the information sought in No. 123 of this Journal.

O. D.—You would avoid the inconvenience by adopting the use of a good pneumatic holder.

W. J. (Liverpool).—Received just as our last "forme" was ready for press. Reply in our next.

F. C. A.—Send a specimen of your failure, and we will endeavour to explain in what you are wrong.

FRED P.—See reply to "Hugh." It is not an extraordinarily quick process, but a very certain one.

J. T.—Yes, sea water will do, but we should not recommend it. Salt is cheap enough, why not use that?

B. S * * * N.—The *cartes de visite* lenses are in no respect essentially different from an ordinary portrait combination.

MULTUM IN PARVO is thanked for his offer, but we fear it is scarcely compatible with our ideas: we will, however, look at the instrument named.

INDIGNANT OPERATOR.—Your question is one for a lawyer. We could give an opinion, but of what value would it be? It would only be that of a layman.

MARY J.—You appear to have omitted the washing away the free nitrate of silver from your proof before immersing it in the toning-bath. This operation is absolutely needful to success.

CORPUS.—Mr. Mayall applied the iodising box used in daguerreotyping to albumen plates several years ago. See *Journal of the Photographic Society*. There is nothing new in the idea or its application.

F. L. B.—If you "salt" your albumen with chloride of barium you will most likely have to filter it before use, as a deposit will certainly be formed, and you may not be able to pour it off clear enough for use.

S. M. J. C.—We cannot recommend the use of gutta-percha for any part of a camera, properly so called: it would never keep its shape for any length of time. A compound known as vulcanite would do for panels.

E. O.—You have been intentionally or unintentionally deceived. The subject you describe, *The Head of John the Baptist*, was executed by Mr. O. G. Rejlander, of Wolverhampton, twelve months or more ago.

T. DRAPER.—You will find the information which you desire in our *Almanac* for the current year. The printing process named we gave a few numbers back; if you are a subscriber you will find no difficulty in discovering it.

WAY'S LIGHT.—If you call upon Mr. Vernon Heath (Murray and Heath), Piccadilly, London, he will no doubt give you information as to cost, &c.; but we fancy that some pyrotechnic composition will answer your purpose as well or better.

R. S. D.—Naphtha is a solvent of marine glue; but in cementing glass you had better make the glass hot, rub the glue against the edges to be joined, and press them together with a sliding motion. Roughing the edges makes the glue hold tighter.

W. FORD.—We could not advise you to purchase one of the instruments which you indicate, as we really know nothing about them. We are not responsible for advertisement assertions; and, in the case to which you allude, we are entirely unacquainted with the facts.

F. P. DAVIS.—If we are "not to refer you to anybody's manual," how can we assist you? We cannot write a whole treatise on purpose: so we must refer you to Hardwich's *Manual;* or if you have not that get it; and if that won't suit you, take a more elementary one, say Mr. Hughes's.

MOUNTER.—If you have many to mount we think you will do well to try the plan suggested by Mr. Stuart, of Glasgow, viz.:—Coat the proof on the back with dextrine, and let it dry; then damp the mounting card or paper, place the proof in position, and pass both under the scraper of a lithographic press. We do not like gum for mounting.

R. PEERS.—We regard formic acid in any form as a decided mistake in photography; but the formula given by Mr. Lyte is as follows, viz.:—For positives, distilled water ten ounces, sulphuric acid three drops, protosulphate of iron half ounce, formic acid one fluid ounce. For negatives, distilled water ten ounces, pyrogallic acid six grains, formic acid one ounce.

C. BROWN.—There is a proverb—"It is well to be off with the *old* love before you are on with the *new*." How can you expect to be successful when you are constantly changing your process? Read the details of several, note which accord best with your personal habits, and select that which seems to suit you; but, having selected one, stick to it till you do succeed, and then, but not till then, try another if you are so inclined.

THOS. BERSTED.—The fault of your prints is simply that your fixing solution is *too weak*, and the hyposulphite of silver formed becomes decomposed. Make your solution of hyposulphite of soda much stronger—say an ounce of the salt to five or six of water. The defect is that known as measles. Lucky for you that you did not apply to our polite contemporary, who would have called you "a muddler," instead of helping you out of your trouble.

OPERATOR'S ASSISTANT.—We do not approve of the plate-cleaning liquids, for the simple reason that you do not know what you are using. If an iron developer be employed by the operator, you will find putting your glasses for a short time (say five minutes) in dilute nitric acid (one part acid to nine of water) a good plan, rubbing the surface with a clean cork, and then copiously washing with water. To remove varnish, old waste collodion is very useful, especially if you have put into it a few lumps of common washing soda, which renders the collodion very fluid, and easily removed by rubbing.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 150, Vol. VIII.—SEPTEMBER 16, 1861.

Micrometry.—A paragraph has been going the round of the photographic periodicals, domestic and foreign, noticing the application in America of photography to the construction of micrometers, this being apparently considered as a novelty—whereas, in truth, it has been in use in this country for several years to a certain extent, and that, in our opinion, as far as it is likely to be serviceable. In Vol. VI., page 172, of this Journal, published 15th July, 1859, will be found a description of Maltwood's finder for the microscope, an instrument constantly kept on sale by the eminent opticians, Messrs. Smith, Beck, and Beck, of Coleman Street, London—the said finder being nothing more nor less than a micrometer, the lines being one-fiftieth part of an inch apart and crossing one another—thus dividing a square inch into 2500 smaller squares, each square containing also numbers disposed fraction-wise, indicative of what may be termed the latitude and longitude of the square in which the pseudo-fraction is located. For a full description we refer our readers to the number quoted. But, although it was not till July, 1859, that a description of this instrument was given in any photographic journal, it was published previously in the *Quarterly Journal of Microscopical Science* in April, 1858, the descriptive paper having been read before the Microscopical Society on the 13th January in the same year. We may add, *en passant*, that Mr. Maltwood is a member of the North London Photographic Association, and has also published the description of a photographic open-air operating box.

The circulation of the paragraph to which we first made reference has attracted the attention of a veteran photographer, Dr. Thomas Woods, who has been engaged in experiments towards the production of micrometers by photography, and who communicated a letter on the subject which was published in the *Philosophical Magazine*, and was reproduced in our issue of the 15th ult.

We have also made experiments bearing upon this subject some years ago—not, indeed, with the object of applying the same to micrometry, because, from our intimate acquaintance with the requirements of an accurate micrometer, we have no hope that photography will be able to aid in the supply of any of a high class, except at a greater expenditure of time and skill, and consequently of cost (even if at all), than is involved in the present ordinary method of their manufacture.

Our own experiments to which we have made allusion were effected in producing the optical toys known as *micro-photographs*, and in some of them we sought to ascertain how far printed matter might be reduced in scale and yet remain legible by subsequent enlargement under the microscope. The negative which we employed for the purpose was a copy of the front page of an early number of this Journal (then known as the *Liverpool Photographic Journal*); and we found that when we had reduced the size so that the small letters were no more than the *two-thousandth part* of an inch in height the entire page was legible, but when attempted upon a still smaller scale astigmation interfered with the definition, first in the corners and then at the sides. Though our optical resources were by no means exhausted so far as this point was concerned, we found it useless to carry the investigation further, because, under the power necessarily employed to render such small-sized letters legible, the structure of the collodion film itself (structureless as it was supposed to be) became offensively prominent and interfered with the sharpness of the letters: it was as if we had attempted to print a fine copperplate engraving upon a piece of coarse whitish-brown paper. Of course our next move was to endeavour to produce a still more homogeneous film; and, though we found no difficulty so far as the collodion itself was concerned, there was no getting over the fact that the iodide of silver, however minutely divided, was formed in distinct particles—more or less closely contiguous, it is true, but still producing under the microscope, when much power was employed, a comparatively rough granular surface with the attendant evils already described.

Of Dr. Woods's accomplishments as a scientific photographer we have been acquainted ever since our own connexion with the art; but from a paragraph in his letter we presume that his attention has not been much directed towards the subject of micrometric measurement, or he would have been aware that the method to which he alludes of making an attempt to view both the object and the micrometer at the same time must necessarily be very inconvenient and inaccurate, and has been abandoned for upwards of sixteen years by scientific microscopists in favour of a plan proposed by the late Mr. George Jackson, a gentleman whose improvements in the mechanical parts of our best instruments have been adopted, and are at present in use, either in their integrity or slightly modified, by every one of our first microscope makers.

It is not at all surprising that Dr. Woods should not be familiar with Mr. Jackson's method, even if the former be a practical microscopist, for his residence in the sister island may have prevented his coming in contact with other workers in the field of microscopical investigation; and when once an improvement in the mechanical parts of the instrument is adopted, it is constantly applied as a matter of course, exciting no remark or discussion, so that, unless an observer at a distance from headquarters happen to have taken cognisance of it at the time of its introduction or shortly afterwards, he is likely not to have his attention drawn thereto subsequently.

On perusing Dr. Woods's letter it will be perceived that his micrometer must consist of a sort of mosaic table like a chessboard, but with all the white squares of every alternate row blackened—or, in other words, of a series of white squares exactly one-thousandth part of an inch square, and placed exactly one-thousandth part of an inch from each other. This would form but a very clumsy scale even if there were no difficulties in its application to contend with, and is an enormous way behind what Mr. Jackson produced mechanically by aid of a ruling-machine of his own construction. We have one of his micrometers now before us in which the lines are the twelve-hundredth part ($\frac{1}{1200}$) of an inch apart, *and the space between them is at least* TEN TIMES *as great* as the lines are in thickness. We have also seen lines of the ten-thousandth ($\frac{1}{10000}$) part of an inch apart ruled by the same machine. But were we to apply a

micrometer ruled even to this degree of minuteness by what we might term the direct method, to most objects it would be of no use—for instance, to ascertain the distance between the striæ in some of the *Diatomaceæ*, as in the *Pleurosigma delicatulum*, in which they are but the sixty-four thousandth part ($\frac{1}{64000}$) of an inch apart, or *Pleurosigma macrum*, where they are but the eighty-five thousandth part ($\frac{1}{85000}$) of an inch from one another; and these are not the smallest spaces that sometimes have to be measured.

It will be evident from the preceding that, until we can obtain very very much finer lines by photographic agency, it is but of little use to attempt the manufacture of micrometers by its aid. Lines as thick as the one-thousandth or even the two-thousandth ($\frac{1}{2000}$) part of an inch are quite out of the question if intended for real work. This is the real point of difficulty, which we see but small chance of being overcome.

Having written so much on this subject, we may perhaps as well indicate how micrometers are usually applied in the microscope, though we admit that this point has scarcely any direct connexion with photography. In order to measure accurately very minute spaces, it is needful to be furnished with at least two micrometers mounted in a slightly different manner, but both of them having their lines filled with plumbago, and covered with a thin piece of microscopic glass cemented on with Canada balsam.

Of these two one is designated the stage micrometer, the other the eye-piece micrometer, both named after their position when in use. The former requires to have its lines ruled as finely as possible—a convenient width apart is found to be the one-hundredth of an inch, with one of these divisions again divided into ten, making one-thousandth of an inch. It is not needful that these lines should be made to cross one another, though there is no objection to such an arrangement: if ruled only in one direction it is quite sufficient, for a reason to be given hereafter. The eye-piece micrometer should have its lines a little stronger than the other, and ruled only a short distance across the glass, proceeding at right angles from a line (real or imaginary) in the other direction. Of these short lines every fifth one should be half as long again as the rest, and every tenth one twice as long, to afford facility in counting. The distance apart of these lines should depend upon the power of the eye-piece with which they are to be employed; for the second eye-piece in our best instruments about the two hundredth ($\frac{1}{200}$) of an inch apart is very convenient. Now for the mode in which they are to be used.

The micrometer with the finer lines having been placed upon the stage of the microscope, and the other one inserted through apertures made to receive it on the eye-piece, in such a position that the lines are in the focus of the eye-lens—that is, in the place occupied by the diaphragm of the Huygenian eye-piece—the microscope is accurately focussed upon the stage micrometer so as to bring its lines clearly into view. These will be seen to have the lines of the eye-piece micrometer superimposed thereon, and they may or may not have some of the latter accurately coinciding with the former; but at any rate it is not at all difficult to make them so by drawing out the inner tube of the microscope body, and with it the eye-piece, &c., until one division of the stage micrometer exactly ranges with any convenient number of divisions in the eye-piece. For instance: supposing we find that the divisions of the eye-piece micrometer exactly divide one division of the stage micrometer (of a thousandth part of an inch) into eight parts, it is evident that the value of each division in the eye-piece is (while the microscope is so arranged) equal to the eight-thousandth ($\frac{1}{8000}$) part of an inch; consequently by removing the micrometer from the stage of the microscope, and substituting the object to be measured, both the scale for measuring and the object can be viewed perfectly, apparently superposed, at the same moment, without the probability of error arising. The reason of this is sufficiently simple: it is the *image* of the object which is enlarged by the eye-piece, and this image is formed in the actual spot occupied by the eye-piece micrometer. But as we can vary the value of the divisions in the eye-piece at will by changing the object-glass and by lengthening or shortening the body of the instrument, we have, in fact (with only two micrometers), an unlimited range of scales by which to make our measurements, whether the objects to be measured are small or comparatively large, and that by an arrangement that is equivalent to the direct application of the scale to the object to be measured. The reason that it is only necessary to rule the lines in one direction is that, the eye-piece being capable of being revolved, and with it the micrometer, of course the scale can not only be applied from left to right but also from back to front, and in fact in any other direction—a very necessary qualification to its thorough efficiency.

We have purposely omitted all minor mechanical details of construction, as it is the principle that we have been anxious to explain, and to show how important it is that the lines in a micrometer should be of excessive tenuity and ruled with the utmost accuracy.

We have already stated that the very beautiful machine for ruling micrometers that was employed by the late Mr. George Jackson was also invented and constructed by himself. We are glad to know that it has fallen into the skilful hands of one who will make good use of it—those of Mr. Ackland, a gentleman connected with the firm of Messrs. Horne and Thornthwaite, of Newgate Street, London.

If after what we have stated in the preceding article any of our readers are inclined to try their hands at making photography compete with the dividing engine for micrometers, all we can say about the matter is that their courage deserves success, and we wish them well through the contest.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

PROTOSULPHATE OF IRON.

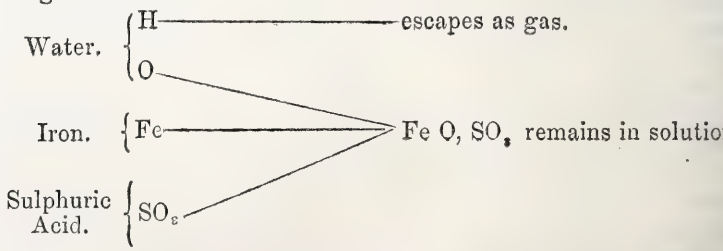
Synonymes.—Green vitriol, green copperas, copperas, ferrous sulphate.

Composition.—Fe. O SO_3 + 7 HO.

Equivalent.—139.

Preparation.—A great deal of the common copperas of commerce is often prepared by exposing roasted pyrites, or bisulphide of iron, to the joint action of air and moisture, in which case the salt is very impure. It may be prepared, however, with great facility by allowing dilute sulphuric acid to act on iron filings or turnings, or on the protosulphuret of iron: this latter process yields a salt quite free from any traces of persulphate, but is, unfortunately, accompanied by the evolution of sulphuretted hydrogen, a gas having the offensive smell of rotten eggs, and is thereby rendered almost impracticable for the amateur. When the more agreeable and almost equally efficient method is adopted of treating clean iron turnings with dilute sulphuric acid, the operation should be conducted in an open basin or pan capable of holding at least twice the quantity of liquid employed. As soon as the materials come into contact a lively effervescence takes place, caused by the decomposition of the water, the oxygen of which combines with the iron to form protoxide of iron, which is at once appropriated by the sulphuric acid and remains in solution, while the hydrogen escapes in the gaseous form.

It may not be inappropriate to illustrate this reaction by a diagram.



When the required reaction seems to be approaching completion, which will be indicated by a considerable moderation in the effervescence, a gentle heat may be applied with the object of ensuring the complete neutralisation of the sulphuric acid by any iron which

may still remain undissolved; and when the effervescence has ceased the solution may be filtered, if necessary concentrated by evaporation, and set aside to crystallise. The crystals yielded should be completely dried as rapidly as possible between folds of blotting-paper, and preserved in well-stoppered bottles. To prevent the absorption of oxygen by the solution, or rather the peroxidation of the protosalt during filtration, it is necessary that the funnel employed should have a long neck, so as to reach nearly to the bottom of the vessel intended to receive the liquor; also the vessel should be previously rinsed round with dilute sulphuric acid, which will keep in solution any slight trace of sub-salt which may be found. The proportions most suitable for the foregoing preparation are—iron filings or clean turnings 200 parts, water 2,400 parts, sulphuric acid 300 parts.

Properties.—Pure recrystallised protosulphate of iron forms bluish-green crystals, which are oblique, rhombic prisms: they have a styptic, metallic taste, and an acid reaction, causing them to redden vegetable blues. The specific gravity of the crystals is 1·8, while the anhydrous salt has a gravity of 2·64. One part of the crystals dissolves in 1·6 parts of cold and in 0·3 of boiling water: the solution has a pale greenish-blue colour, and the white, partly dehydrated, salt is precipitated therefrom by alcohol and sulphuric acid. Glacial acetic acid also precipitates the salt from its aqueous solution without causing any change or leaving a trace of iron in the liquid. Sulphate of iron is fusible in its own water of crystallisation. It effloresces in a dry atmosphere, but deliquesces in air charged with moisture. A solution of sulphate of iron absorbs nitrous oxide gas, forming a dark greenish-brown liquid, which, on account of the nitrous gas itself being a reducing agent, has been recommended as a more efficient developing agent than protosulphate of iron alone; the solution, however, is wanting in stability, requires some little dexterity in its preparation, and, moreover, its action on the silver salt is not so much under control as the protosulphate itself.

For the convenience of weighing, in the preparation of small quantities of developing solution, and also for the sake of portability, it sometimes becomes desirable to have this salt in a finer state of division than it is usually found in commerce; in which case the following process may be resorted to, and will be found to yield a very pure product in a very convenient form:—Take of *pure recrystallised* protosulphate of iron (such as *should be* purchaseable at any photographic warehouse), 500 parts; water, 550 parts; clean iron turnings, 8 parts: boil these together for half an hour. [The object of the iron turnings is to ensure the complete neutralisation of any free acid which may have existed, mechanically imprisoned in the interstices of the crystals.] At the end of this time filter, while still boiling, into a vessel containing a mixture of 375 parts of alcohol, sp. gr. ·834, and 8 parts of oil of vitriol, the mixture being actively agitated during the whole time of filtration. On cooling the whole may be thrown on a linen filter, drained, and dried as rapidly as possible between folds of bibulous paper frequently renewed. The liquor which comes through the linen filter, notwithstanding the precautions above enumerated, will be found to be slightly coloured, owing to the alcohol conveniently holding in solution the whole of the persalt of iron formed by contact with air during filtration, the solubility being increased by the addition of the free sulphuric acid. The minute crystals yielded by this process contain their full amount of water in accordance with the composition given at the commencement of this article.

Uses.—Protosulphate of iron is used in photography as a developing agent in the positive collodion process, and depends for its application to this purpose on the affinity which it possesses (in common with other protosalts of iron) for oxygen. Its action in this process consists in absorbing the oxygen of the nitrate of silver, and thereby causing the precipitation of pure metallic silver on the film of iodide of silver which has previously suffered a peculiar molecular disturbance by exposure to light. The protosalt of iron passes in this reaction into the state of persalt, and, if the proportions of ingredients in the developing solution are suitably combined, ought to remain in solution. Its special applicability also for the positive collodion process arises from its inorganic nature enabling it to cause the precipitation of *pure white* metallic silver, it having been found that reducing agents of an organic origin, such as pyrogallic acid, while effectually developing the latent image, throw down a precipitate of silver which is coloured yellow by combination with the organic matter of the developer. This salt is also employed in the negative collodion process as a preliminary developer in those cases where, through short exposure or deficient illumination, a *slight* molecular disturbance only of the iodide film has taken place; it is usually followed by a second development with pyrogallic acid, in order to obtain that impermeability to light which is required in the high lights of a negative. Notwithstanding it should not be supposed that the density requisite in a negative cannot be produced by protosulphate of iron alone, for very excellent results have been obtained by the employment of a solution of this salt containing about forty or fifty grains to the ounce of water. It has also been successfully employed in some instances to develop pictures obtained by the dry collodion processes.

Impurities.—The possible impurities in protosulphate of iron are, besides persulphate of iron, the sulphates of copper, zinc, tin, manganese, alumina, magnesia, and lime, and sometimes arsenious acid; these, as will readily be imagined, are more accidental impurities arising from the method of manufacture than intentional sophistications, as there would be so little to be gained by adulterating so cheap a salt. Ordinary sulphate of iron, such as is supplied for photographic purposes in England, would not be likely to contain all the preceding impurities; but it may happen to the "photographer abroad" to require some of the salt in question, and the only article obtainable at the time may be common green copperas—an article so impure as to be inapplicable to the delicate operation of developing a photographic image; in which case, without going into an elaborate series of experiments to determine *what* impurities are present, it will much simplify matters to assume the existence of *all* the above impurities, and proceed in the following manner:—Dissolve the impure salt in water, and, with the object of decomposing the persulphate of iron and removing the copper, add thereto sulphuric acid in quantity rather less than one-twentieth of the weight of the liquid, and iron turnings in a quantity bearing the same proportion to the weight of the solid green vitriol employed; digest these together for twenty-four hours and filter the solution, through which, if it be desired still further to purify it, sulphuretted hydrogen should be passed to saturation, the liquid set aside for two days, and finally warmed, filtered, and evaporated to the crystallising point. This second operation with sulphuretted hydrogen has the effect of removing the arsenic and tin, and any traces of copper not precipitated by the previous treatment with iron and sulphuric acid. The separation of the remaining impurities would involve a further complication of the process into which it is hardly necessary to enter, as they exist in such small quantities as scarcely to exercise an appreciable influence on the result.

Tests.—When protosulphate of iron has become oxidised and the formation of a sub-persulphate has taken place, it will at once be evident from the rusty yellow appearance of the crystals, which should be a bright emerald green. Evidence of the presence of copper may be roughly obtained by dissolving a portion of the salt under examination in water and plunging a clean table knife into the solution, when, if copper be present, the bright steel surface will be found to be coated with that metal.

Effect of Internal Administration.—Sulphate of iron enters largely into the composition of many valuable medicinal remedies, and is administered in rather considerable doses. It cannot, therefore, be regarded as a very active poison. According to Taylor, "a dose of an ounce has been found to produce vomiting, purging, and frequently death."

Antidote.—Should there be reasonable evidence from the existence of the symptoms named above and other attendant circumstances that this salt has been taken in a poisonous quantity, the best thing to administer will be magnesia, or an alkaline carbonate, say carbonate of soda dissolved in water. The magnesia should of course be diffused through water or milk before it is given to the patient.

INTENSIFYING PROCESSES.*

By C. Jabez Hughes.

When a negative is developed by pyrogallic acid, abundance of intensity is easily obtained; indeed, the usual fault is that the pictures are too intense, and, in consequence, deficient in half-tone, though this need not be if due care be taken. Yet the practice of using a bromo-iodised collodion and developing with iron possesses so many advantages that it is rapidly superseding the former method. The drawback to this plan is that the iron rarely produces a sufficiently dense deposit to make a good printing negative, and recourse must be had to some additional plan to obtain the required density.

When developing with iron it is always a good thing to obtain as strong a deposit as possible, in the first instance. With some

* Extracted by permission from *Principles and Practices of Photography*. 2nd Edition.

samples of collodion and in good light a vigorously printing negative can be obtained at once by the iron; usually, however, the deposit requires some addition to complete the required opacity, and occasionally, especially with short exposures, the first deposit is so very thin and weak that great trouble is experienced in making a negative having good printing qualities. It should be remembered that all intensifying or strengthening processes have a tendency to produce hardness and destroy half-tone, therefore great care is required in using any of them. There are three stages during which a negative may be intensified:—before the yellow iodide of silver is dissolved out; after the iodide is dissolved out and the fixing solution has been well washed away; and also after the film is entirely dry.

The following are the most approved methods for intensifying before dissolving the iodide out. First wash the plate thoroughly to remove the iron solution; then pour on the plate a little nitrate of silver solution, strength twenty or thirty grains to the ounce; let it flow backwards and forwards over the plate to mix well with the water on the surface, and then pour over a fresh portion of the iron developer previously used. The developing will begin anew, and if the negative only need a little strengthening this method will quickly answer. The solution may be poured on and off the plate until it becomes muddy, when the operation may be repeated with fresh quantities until the desired density be obtained. This operation must be entirely conducted in the dark room.

Instead of iron and silver a more usual method is to employ pyrogallic acid in the manner described on page 27. This plan is an excellent one for producing soft yet vigorous negatives, and is one that can be strongly recommended as applicable under almost all circumstances.

Another method—when the exposure has been very short, and there is very little detail in the shadows—is, after developing with the iron and getting out all that can be obtained by that means and well washing, to pour on a saturated solution of bichloride of mercury. This quickly intensifies the high lights and brings out the details in a remarkable manner. After well washing, a very weak solution of hyposulphite of soda (strength about 1 ounce to a pint of water), must be poured over, which will change the colour to a rich brown. The plate must now be washed, dried, and varnished, *with the iodide of silver remaining in the film.* If the hypo. be strong enough to dissolve out the iodide it will dissolve also the mercurial deposit, and destroy the negative character. The presence of the iodide will only cause it to print a little slower.

Some operators prefer to strengthen their negatives in the second stage, that is, *after* they have dissolved the iodide of silver. There are several plans of doing this, and those that depend on the reduction of silver must all be done in the dark room. In all instances the cyanide or hypo. must be thoroughly washed away before commencing to intensify.

When only a slight increase of intensity is required a little silver solution may be flowed over the plate, and the iron developer used in the manner previously described. The silver will be thrown down in a grey crystalline powder, which is not favourable to opacity.

A better plan is to use the pyrogallic and silver as in a preceding method, the colour being thus changed to a non-actinic brown, which produces great intensity.

A good intensifier, when the picture does not require much strengthening, is a solution of chloride of gold, one grain to the ounce. It has only to be flowed over and the effect is produced immediately by changing the previously grey deposit to nearly a black colour.

Bichloride of mercury was formerly in great request as an intensifier, it then fell into disuse, and has recently come into favour again. It is very powerful in its action, and requires to be used with great care, as it has a tendency to produce hardness, and to rot the film. These latter defects may, however, be remedied by employing clean glasses, suitable collodion, and by a more sparing use of the bichloride itself. A convenient strength is about two grains to the ounce of water. This will form nearly a saturated solution, and will serve for all the processes in which it is alluded to. It should be poured uniformly over the film to avoid stains: it produces its effect in a few seconds, changing the surface of the negative to a blackish grey. If allowed to remain on long it would change to a white: this must never be done, or the delicate half-tones will be lost. Wash the plate well, and pour over it a solution of iodide of potassium, two grains per ounce, which will turn it a dirty greenish-grey colour—not pleasant to look at, but an excellent one for printing. If the iodide solution turn the film a bright yellow, the bichloride solution is too strong, or has been allowed to remain on too long. The bright yellow colour is nearly useless for printing.

Instead of the iodide a weak solution of hyposulphite of soda may be poured over, which will change the colour to a rich brown; or a dilute solution of ammonia may be used, altering it to a blackish colour.

Another intensifying solution based on the same principles is composed thus:—To a saturated solution of bichloride of mercury add a solution of say ten grains to the ounce of iodide of potassium: a red precipitate will soon form, and the iodide solution must continue to be added till it re-dissolves the precipitate and becomes clear again. This solution has great intensifying powers, and may be used in preference to those already named, the same precautions being required not to over-do the intensifying.

Another plan for strengthening a weak picture after the iodide is dissolved out, and while still wet, is to pour over it a solution composed of iodide of potassum two grains, iodine one grain, water one ounce. Allow it to remain on the film about half a minute, then wash well, and then pour over the usual pyrogallic solution, to which a few drops of silver have been added, as if continuing the development. If the required intensity be not produced by the first application, the iodine solutions and pyrogallic may be alternately used, washing well between, and thus almost any amount of intensity may be obtained, even from a weak negative. The use of the iodine solution is not itself to produce intensity, but to alter the condition of the film to enable it to receive a fresh addition of deposit from the pyro. and silver solution to be afterwards used.

Some persons prefer, after they have dissolved out the iodide, to let the plate dry before intensifying. Excellent pictures may be produced by this method; but, as there is an increased tendency to produce hardness, the greatest care must be taken. The plate should be thoroughly dried, then the surface well wetted, and any of the intensifying methods already described may be proceeded with. The best effects have, however, been produced by the application of the bichloride of mercury solution, succeeded by the iodide of potassium.

With some collodions the film becomes detached from the glass when re-wetted: in such case the plate had better be varnished about an eighth of an inch all round with a camel-hair brush before wetting. Benzole, spirit, or black varnish will do.

When bichloride of mercury is used as the intensifier, the plates should be allowed to dry spontaneously, as the application of heat sometimes causes the film to break up when it otherwise would not have done so. If the film on drying shows fine crapy lines, especially in the intensest parts, the fault lies in the collodion: it contains too much water, and is not suitable for the process.

All the above methods may be safely relied on for producing the effects attributed to them; but some, especially the bichloride ones, require judgment and experience. They must not, therefore, be hastily condemned if the first trial or two be not successful. Some processes succeed better in one person's hand than in another's: the best plan, therefore, is to adhere to that one which succeeds best, for, after all, the final result depends not so much on the process as on the person who uses it.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. VIII.

DISTORTION.

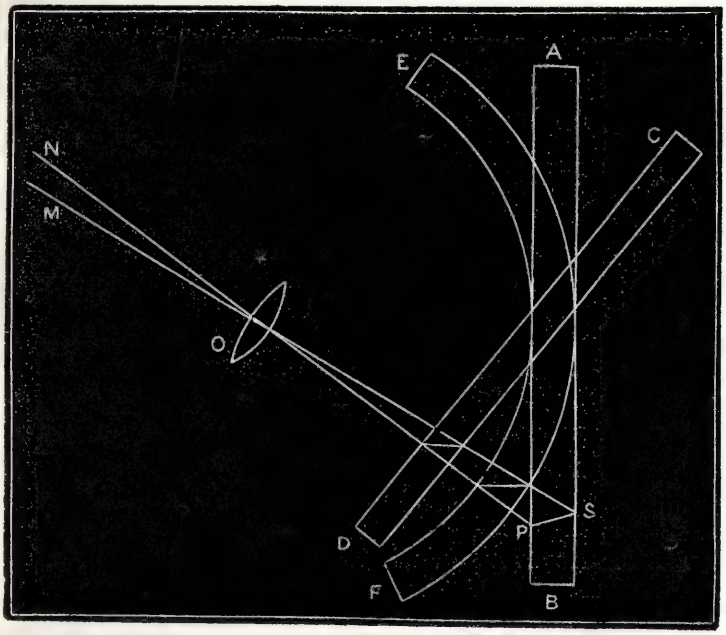
Before commencing this subject I will, in the first place, draw the reader's attention to my paper *On Distortion*, read before the London Society on the 6th of November, 1860, and inserted in the Journal of the Society and also in this Journal, on the 15th of the same month, and recommend him to read and digest that, whereby he will the more readily comprehend my present article.

In discussing the subject of distortion, and how it is produced in pictures, it is indispensable to have as clear ideas as possible of the mode in which images of objects are formed in the eye, and to compare this with the means by which photographic pictures are produced and the conditions which determine their correctness or otherwise. It is generally supposed that rays issuing from objects are refracted to a focus on the retina of the eye, forming thereon images of all objects within view; and the eye being of a globular form, with its lens in front, that the retina is of a spherical form, whose centre is the centre of the lens: therefore, to obtain a picture similar to one on the retina, it ought to be taken on a glass or substance whose form is spherical, so that the angles under which objects are seen by the eye will be the same as those sub-

tended by the pictures of the objects on the spherical glass. But, as pictures are taken on flat surfaces, it becomes necessary to ascertain how they are affected by the various positions in which those flat surfaces are placed. Perhaps if I state my opinion, or make an assertion of what I believe to be the correct or best position in which a plate ought to be placed to obtain the most correct result, and then go on to state my reasons in support of it, it may be the most certain way of securing assent to the assertion. Well, then, I assert that in all cases, whether taking views or portraits, the plate ought to be vertical, or as nearly so as possible, in whatever direction the axis of the lens may be pointed, whether up, down, or sideways; and further, that (particularly in taking a single object) the best stand-point for the camera, as regards elevation, is half the height of the object, and the middle of it, horizontally: this is the more indispensable where there are straight outlines.

If we look at an object (say a tall, square tower) horizontally, and at such a distance that we can see the whole of it at once, and then turn the eyes up and look directly at the top of it, I say the tower in any and every part will appear of the same size in both ways of looking at it, although the part farthest from the line of visible direction in any case will not be well defined—that is, seen clearly—because of the astigmation of the oblique pencils. I think this will be seen at once to result from the globular form of the eye, and its capability of adjusting itself, so as to bring either near or distant objects in proper focus on the retina, whereby it follows that the focal length is the same for near or distant objects, or nearly so.

FIG. 2.



But with a flat plate the case is widely different. Referring to *fig.* 2., A B is the plate in a vertical position, C D the plate inclined to the perpendicular, and E F supposed to be a spherical form or segment of a sphere, similar to the retina of the eye; O the lens, and M S and N P rays from the upper part of the tower. Now, as the rays, after passing the lens, diverge, it is evident they will be farther asunder on striking the vertical plate than they are on the spherical segment; therefore the picture of the upper part of the tower will be larger than it is on the spherical segment, and the picture of the lower part of the tower, on the upper end of the vertical plate, will be in like manner too large—as *usually viewed.* But if the eye were placed where the lens is, everything on the vertical and inclined plates and also on the spherical segment would appear correct, as was proved in my paper before referred to. Now, if the eyes were placed behind the vertical plate in a position similar to that of the lens in front, it is manifest the picture on the vertical plate would appear in every part of the same size as when viewed from the position of the lens. But with the inclined plate and the spherical plate (if I may use such an expression), matters would be completely altered, for the marginal parts of the picture on the spherical plate would seem too small and those about the centre too large, and, moreover, much distorted; and with the inclined plate, the upper part would appear too large, in consequence of its nearness to the eye, while the lower part would seem too small because of its distance.

The upper and lower parts of the picture on the vertical plate would not vary so much in size from the same parts on the spherical plate as to attract particular notice; but the same parts on the inclined plate would vary greatly from those on the spherical plate, and consequently from correctness—that is, if the inclined plate were held vertically before the eyes—the part of the picture on the lower half of the inclined plate might not differ much from the same part on the spherical plate, because of its inclining the same way as the spherical. But, in consequence of the upper part of the plate inclining the contrary way to that of the spherical, it is certain that that portion of the picture would be unnaturally enlarged, and the result would be that a picture of the tower taken on a plate inclined to the perpendicular instead of being *square* would be in the form of a frustum of quadrilateral pyramid; therefore it is proved that, to take a picture of perpendicular objects, to appear the *most* correct when viewed in the ordinary way, the plate ought to be vertical, and that, if possible, it is preferable to elevate the camera sufficiently high than to stand on the ground, point the axis of the lens upwards, and so incline the plate; or otherwise, if that cannot be done, the apparatus should be so arranged that, although the axis of the lens *may* be pointed upwards, yet the plate *must* be vertical.

If the kind of distortion above referred to be disagreeable when the axis of the lens is pointed upwards and the plate not vertical, it is quite shocking and unnatural when the axis of the lens is directed downwards from an elevated position, and the plate also in this case inclined to the perpendicular; for, now matters are reversed, the bottom of the tower will be narrower than the top, and the same with any other rectangular building near. What is more unnatural than a building with the top half as wide again as the bottom? This sort of distortion can be rectified by the same means as the other; therefore, it is quite unnecessary to go over the same ground again. Distortion in both these cases is seen in its worst aspect when rectangular buildings are near at hand: the more distant they are the less it shows.

I may be asked here what description of arrangement or apparatus would be the best under these conditions? I answer—I have shown the causes of these kinds of distortion. It rests with the opticians to produce suitable apparatus, and for every photographer to make the best dispositions he can under the circumstances in which he may be placed; but, if a picture cannot be taken in any way to avoid these distortions, then the best plan must be to copy and correct them as explained in my article on copying.

The foregoing relates to what may be called perpendicular distortion; but the same statements apply to horizontal distortion—for instance, a wide building or row of houses taken with the plate not parallel to the front. In this case the plate should always be parallel with the front of the building, no matter in what direction the axis may be, whether perpendicular or oblique to the front; or the distortion may be corrected in copying, as stated in my article on that subject.

So far as distortion in portraits is concerned—that is, as to the upper or lower parts of the person being too large or too small—of course the camera can be put in any position, and therefore in the best. In taking a portrait, draw an imaginary line from the extreme points (to be included in the picture) of the person, and then direct the axis of the lens to the middle of that line, and perpendicular to it, and your object is gained. If the person sit upright, the axis must be horizontal, and pointed at the middle of that portion of the sitter which is to be taken. If it be a whole-length portrait, and the sitter lean back, protruding his legs and feet forward, then the camera should stand a little higher than the middle point of the person, and point somewhat downwards; for otherwise the head would be too small and the legs and feet too large—remarkably so if the distance between the camera and sitter be short.

As objections may be raised, and dissent expressed, to what I have here stated—as such have been before—I merely request all photographers who read these papers to try the experiments, and convince themselves of their correctness and value; and thus I leave every person to judge for himself.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

We are requested to remind members that the first meeting for the forthcoming session will be held at Myddleton Hall, Islington, on Wednesday next, the 18th instant, at eight o'clock. It being the first meeting under the new arrangement, members are requested to bear in mind the alteration of the days of meeting from the last to the last Wednesday but one in each month. A paper by Dr. Maddox will be read, and samples pictures by Harrison's (American) lens, and others recently remarked upon, will be exhibited at the meeting.

British Association.

MANCHESTER MEETING, 1861.

THE thirty-first meeting of the British Association for the Advancement of Science, just concluded at Manchester, has been a most successful one—in a pecuniary sense, *the* most successful meeting the Association has ever held. The precise number of Members and Associates enrolled was 3,139, from whom the large sum of £3,905 was received in annual subscriptions and compositions from new life members. How provocative of thoughtful reflection on the part of the older members of the Association are these annual gatherings of the body! According to the usual calculation of the actuaries, a whole generation has passed away since the British Association was inaugurated, and yet how many of its originators remain! Still some of the most eminent of its founders have passed away from among us, while others are compelled, through illness or infirmity, to absent themselves from their loved occupation, and are thus prevented from giving their active and willing services in its various offices. Truly may its younger members ask, "Our fathers! where are they?"

Manchester has done herself honour in the reception she has given to the British Association, not only in the munificent hospitality displayed towards its members, but also in the admirable and systematic arrangements for the proper conduct of the business of the Association, and in the important part taken by many of her distinguished citizens in the work of the Sections. Mere theoretic science might possibly have found a more congenial home in academic halls and venerable colleges; but science surrounded by the *results* of theory applied to practical and useful ends is appropriately located in the manufacturing metropolis of the north. The markets of the world own to the value of the labour of the teeming population of this district; and in no other locality have the applied sciences been so largely or so beneficially utilised for the supply of the world's demand for the special manufactures of this remarkable and wealthy city.

To fill the office of President of the Association for the present year, a happy choice was made in the selection of one of Manchester's most eminent citizens, Mr. William Fairbairn. No higher encomium need the many warm admirers of the President have desired than that bestowed upon him by his friend, Mr. J. A. Turner, M.P., who, in seconding the vote of thanks for the admirable Address read at the opening meeting, said, in allusion to the title of D.C.L. conferred on Mr. Fairbairn:—"Your learned societies may add letters to that name—they may give him the dignity of a doctor, and may even make him President of this Association—but William Fairbairn, making his own way by his own merit, and distinguishing himself, not only by talent, but by his modesty and unassuming character, will ever be remembered in this community as one of its most distinguished ornaments."

The President's Annual Address was a massive document, imparting in its "unadorned eloquence" a clear view of the progress made in nearly every department of science up to the day when the address was read. As the representatives of an art-science, whose rise and progress has been as remarkable as, perhaps more rapid than, any other branch of science—while its utility and varied application are being hourly developed in many important directions—we must take exception to the President's otherwise valuable address in one particular: the very existence of photography, the youngest-born of science, was ignored!

How Mr. Fairbairn, who in his life and labours is himself the impersonation of the applied sciences, should have overlooked in his annual review so important, so useful, and so beautiful an application of optical, chemical, and mechanical science, is to us a source of wonder. Indeed, we may here add, that it is curious, if not sad, to see what a very low position photography usually occupies in the programme of the proceedings of this peripatetic Association. While our art-science supplies useful matter to fill the columns of no fewer than four journals, it only ministers three or four papers out of the vast mass brought before the Sections of the British Association. We cannot imagine that the officials of that body discourage the production of papers by the masters and disciples of photographic science: the cause, we fear, must be traced to a reprehensible supineness on the part of the latter in the preparation of papers to be read at the annual congress of our scientific *savans*. It is to be hoped that this reproach will have passed away with the late meeting at Manchester.

If the followers of our art throughout the empire have been "conspicuous by their absence" at the British Association, no small amount of praise is due to the gentlemen who organised the Photographic Exhibition held in connexion with the recent meeting, and whose doors are still open. In the arrangement of the large number of pictures contributed, the Committee displayed an intelligence and fine taste, combined with sound judgment, which we hope to see followed up in similar exhibitions elsewhere in future. The results produced by every process introduced since the days of the calotype were grouped together, thus enabling the visitor to compare results, to detect the merits and the failings of every process, and to mark the progress of the art during the brief period in which it has flourished as a distinct branch of the fine arts. Indeed, this Exhibition presents a mural history of our art-science, as clear in the exposition of its rapid development as it is interesting to the student of art generally, in the study of the many beautiful pictures thus systematically classified. As the Exhibition is critically noticed in a distinct article, we shall here leave the subject, again congratulating the Committee which organised the display on the satisfactory result of its "labour of love." Mr. W. T. Mabley acted as Secretary of the Exhibition Committee.

While speaking of pictures we must not omit to mention another and most appropriate display prepared by the indefatigable Messrs. Agnew and Sons. At the picture gallery of this firm, in Exchange-street, there was an exhibition of the portraits of eight remarkable men to whom the world in general, and Manchester in particular, owe an enduring debt of gratitude—men whose names the world would not willingly let die. They were the portraits of the great inventors of the machinery used in the cotton trade, namely:—John Kay, inventor of the fly shuttle; Richard Arkwright, inventor of the water-twist frame, or throstle, for spinning yarns; Samuel Crompton, inventor of the mule for spinning fine yarns; Edmund Cartwright, inventor of the power-loom; Joseph Marie Jacquard, inventor of the apparatus for figure weaving; William Radcliffe, inventor of the dressing machine; Richard Roberts, inventor of the self-acting mule; and Joshua Heilmann, inventor of the combing machine. These interesting pictures are the property of B. Woodcroft, Esq., of the Great Seal Patent Office, by whom they were kindly lent to the Messrs. Agnew for exhibition during the meeting of the British Association. How much does civilisation owe to the thoughtful labours and invaluable inventions of these eight illustrious men! Their names deserve to be held in grateful remembrance in every civilised nation in the world.

All the leading manufactories, public institutions and buildings, libraries and news-rooms, were freely thrown open to the members of the Association, and many pleasant and profitable hours were spent by strangers to the district among the busy workshops and gigantic factories of this great centre of industrial occupation. In no other locality has a more kindly welcome by the inhabitants been given to the Association, or more courtesy displayed towards its members.

Manchester has reason to be proud of its public buildings, many of which were devoted to the purposes of the meeting. The Free Trade Hall, in which the President's Address was delivered and the *soirées* were held, is a noble building, ample in its proportions and pretentious in its architecture. On the recent occasion it looked magnificent when crowded by the distinguished and richly-attired visitors who promenaded the great hall or occupied seats in the galleries. To enhance the beauty of the scene a large number of fine specimens of pictorial art was placed round the walls above the galleries, and surrounding each picture was an elegant and artistic draping of crimson cloth, the spaces between the pillars being relieved by the introduction of very beautiful plants. Below, ranges of tables were filled by specimens of mechanical skill and ingenuity, while Owen's College contributed largely of the contents of its museum, and wealthy private citizens vied with each other in sending valuable and interesting articles of *vertu* and of utility to impart additional attractions to the magnificent displays at the evening meetings and *soirées*, of which there was one every evening. On Thursday there was a *soirée*, at which was the largest and finest collection of microscopes and microscopical objects ever brought together in this or any other country; on Friday an open *soirée*, after Professor Miller's lecture on the *Spectrum Analysis* at the Music Hall; on Saturday a *soirée*, in which was brought together specimens of almost every known instrument connected with the telegraph systems, communications being carried on between the Prince Consort at Balmoral and the President in the hall, and also with Paris, Berlin, St. Petersburg, &c.; on Monday, the Astronomer Royal's discourse on the results of the

expedition to Spain last year to observe the eclipse of the sun; and on Tuesday, a *soirée* organised by the Natural History Society of Manchester, which brought the series of evening meetings to a successful close.

We regretted to notice that, at the concluding General Meeting on Wednesday, while the thanks of the Association were supposed to have been given to all who had in any way contributed to the success of the late meeting and to the hospitable reception of the Members, the great exertions of the local press were overlooked. At no former meeting were the proceedings of the Association so amply and so carefully reported. We desire to place on record the great public spirit displayed by the proprietors of the *Manchester Guardian* and *Manchester Examiner and Times*, in presenting daily to their readers the most ample details of everything interesting connected with the Manchester meeting. From personal knowledge we can assure the Members that this was accomplished only by a most liberal expenditure on the part of the proprietors of the excellent newspapers alluded to.

We now proceed to give the few papers having a connexion with our art which were brought before Section A. (Mathematical and Physical Science), Section B. (Chemical Science), and Section G. (Mechanical Science), the only Sections in which photography has a *locus standi*.

SECTION A.

Thursday, Sept. 5th.

PHOTOGRAPHY appropriately opened the proceedings of Section A. Mr. Warren De la Rue, the first of living astronomical photographers, and whose utterances on our art-science, unfortunately too few, are at all times received with the respect due to such a master, read the following interesting

Report on the Progress of Celestial Photography since the Meeting at Aberdeen.

AT the Aberdeen meeting I had the honour of communicating to this Section a report on the state of celestial photography in England, which has since appeared in the Transactions of the Association. Since that period I have pursued my investigations in this branch of astronomy, and ascertained some facts which I believe will be of interest to the meeting.

In the first place I beg to recal to the recollection of members who may have read my paper, and re-state for the information of these who have not done so, that it was intended, at the period of the Aberdeen meeting, that the Kew photoheliograph should be taken to Spain, in order, if possible, to photograph the luminous prominences, or, as they are usually called, the red flames, seen on the occasion of a total solar eclipse. The words implying a doubt as to the success of the undertaking were advisedly inserted, because so little information could be collected from the accounts of those observers who had witnessed previous total eclipses as to the probable intensity of the light of the corona and red flames in comparison with other luminous bodies. My impression was that I should fail in depicting the prominences in the time available for doing so, because I had had the Kew instrument tried upon the moon, and failed utterly in getting even a trace of her image on the sensitive plate, and the corona and prominences together were supposed not to give as much light as the moon. I therefore pointed out the desirability of other astronomers making attempts to depict the phenomena of totality by projecting the image of the prominences direct on to the collodion plate without enlarging it by a secondary magnifier as in the Kew instrument. It was fair to assume, with the great experience I had acquired in celestial photography, that I should succeed with the Kew instrument, if success were attainable; and I knew that far more reliable results would be obtained by this instrument than by the other means I recommended should be employed, as the surer means of obtaining some record.

Two theories existed, as is well known, to account for the red prominences—the one, prominently supported by the Astronomer Royal, was that they belonged to the sun; the other, which is still supported even by an astronomer who obtained photographs of them at the last eclipse, was that they are produced by the diffraction of the sun's light by the periphery of the moon. It will be seen, therefore, how essential it was not only to obtain photographic images of the prominences, but also how important it was to obtain such perfect images of them that they could not be confounded with the purely diffraction phenomena, if such existed, and that the images should be on such a scale that the defects common to collodion could not be confounded with them. "The pretty near" would have been far more readily accomplished; but, having the whole bearing of the subject fully impressed on my mind, I preferred to make a bold venture, and either accomplish what I aimed at or fail entirely. Fortunately I was successful, and to that success the steadiness of my staff much contributed. We now know that the luminous prominences which surround the sun—for they do belong to him—can be depicted in from twenty to sixty seconds, on the scale of the sun's diameter equal $\frac{1}{8}$ of the object-glass employed—that is to say, an object-glass of three inches aperture will give a picture of the prominences surrounding a moon four inches in diameter.

The next subject to which I have to call your attention is the photographic depiction of groups of stars, for example such as form a constellation like Orion—in other words, the mapping down the stars by means of photography.

I have made several experiments in this direction, and have obtained satisfactory results, and I believe that, at last, I have hit upon an expedient which will render this method of mapping stars easy of accomplishment.

The instrument best adapted for this object is a camera of short focal length in relation to the aperture, like the ordinary portrait lens, the size of lens being selected to suit the scale of the intended photographic map; and the camera of course mounted on an equatorial stand, with clockwork motion. The fixed stars depict themselves with great rapidity on a collodion plate, and I have experienced no difficulty in obtaining pictures of the Pleiades by a moderate exposure even in the focus of my telescope, and they would be fixed much more rapidly by a portrait camera.

The difficulty in star-mapping does not consist in the difficulty of fixing the images of stars, but in finding the images when they are imprinted, for they are no bigger than the specks common to the best collodion. It is of no service attempting to overcome the difficulty by enlarging the whole picture; but something may be done by causing the images of the stars, which are mere spots, to spread out into a cone of rays by putting the image out of focus, and thus to imprint a disc on the plate instead of a point. Last year has been so fully employed that I have not yet had time to fully develop this method, but I have ascertained its practicability.

Some curiosity naturally exists as to the possibility of applying photography to the depiction of those wonderful bodies, the comets, which arrive generally without anything being known of their previous history, and absolutely nothing as to their physical nature. It would be valuable to have photographic records of them, especially of their nucleus and coma, which undergo changes from day to day, and hence such a means of recording their changes as photography offers would be the best beyond comparison, if the light of the comet were sufficiently intense to imprint itself.

On the appearance of Donati's comet, in 1858, I made some attempts to delineate it with my reflector on a collodion film, but without success; and on the appearance of the comet of the present year I made numerous attempts, not only with my telescope, but also with a portrait camera, to depict it; but, even with an exposure of fifteen minutes (minutes, not seconds), I failed in getting the slightest impression, even with the portrait camera. Hence this conclusion may be arrived at, that the actinic ray does not exist in sufficient intensity in such a comet as the last to imprint itself, and, therefore, photography is inapplicable to the recording of the appearances of these wonderful bodies. I now return to heliography.

Experiments conducted at the Kew Observatory, by my request, have shown that for an image of the sun of any given size, when once we have ascertained what aperture of the telescope is sufficient to produce the picture with the necessary degree of rapidity, it is not beneficial to increase that aperture—that is to say, no more details are depicted, nor does the picture become sharper so as to bear a greater subsequent enlargement in copying than when the smaller aperture is used. It has also been ascertained, experimentally, that it is not well to enlarge the image beyond a certain point, by increasing the magnifying power of the secondary magnifier, so as to cause the rays to emerge at a greater angle.

These results are such as I should have anticipated; but as it was, nevertheless, desirable to produce pictures of the sun's spots, with a view to their closer study, on a scale considerably greater than the pictures produced by the Kew instrument, I commenced some preparations at my own observatory for trying whether it would be possible to procure such pictures with my reflector. On maturing my plans, I found that the apparatus which it would be necessary to append would be so weighty that the telescope would require to be strengthened considerably, to support the additional weight in the awkward position in which it had to be placed; and it did not at first appear how this could be conveniently done. Ultimately, I found the means of adding a radius bar, and of supporting the plate holder, which carries a plate eighteen inches square, at a distance of four feet from the eye-piece.

But here another difficulty occurred, namely, that the image of the sun was so powerfully heating that, if allowed to remain for a very short time on the instantaneous slide, it heated it and ultimately set fire to some part of the apparatus. A trap easy to be moved over the mouth of the telescope had to be contrived so as to open just before the instantaneous apparatus was brought into action and again shut immediately afterwards.

At last these mechanical difficulties were surmounted, and I commenced my experiments to ascertain the best form of secondary magnifier. These experiments are still in progress, and some important difficulties remain to be overcome before pictures of the sun's spots will be obtained with that degree of sharpness which shall leave nothing to desire.

With an ordinary Huygenian eye-piece employed as a secondary magnifier, and placed somewhat nearer the great mirror than its position for the most perfect optical picture, in order to throw the chemical rays further on so as to bring them to a focus on the plate, I have obtained some

sun pictures of very considerable promise on the extremely large scale of the sun's diameter, equal to 3ft. These pictures have only been very recently procured, and I submit them to the Section because I believe that an interest is felt in the progress of celestial photography, and that our members prefer to take part in the experiments as it were by watching their progress rather than to wait until the most perfect results have been brought about.

I may state the mechanical and chemical difficulties have been surmounted, and the only outstanding one is the form of the secondary magnifier. When this has been worked out, perfect sun pictures, three feet in diameter, will be obtainable with a telescope of one foot aperture in less than the twentieth part of a second of time. These pictures, when taken under suitable circumstances, may be grouped so as to produce stereoscopic pictures, which must throw considerable light on the nature of the spots.

It appears to me that such results must be of value to science, and that such records of the state of the sun's photosphere, both as regards spots and other changing phenomena, which are obtainable by means of photography are worth collecting and discussing. It is agreeable to me to work out the problem, so as to point out the means by which success is attainable, and I may for a time carry on the records; but it will, on reduction, be seen that these observations, if continued as they should be for years, are likely to prove a serious tax upon the leisure and purse of a private individual.

[Several photographs depicting the sun's spots were handed round, and were viewed with great interest by the members of the Section.]

Professor CHEVALLIER said that, having been in Spain during the eclipse, he could bear testimony to the value of Mr. De la Rue's achievements. He himself had the opportunity of making one experiment which showed that the light of the corona was brighter than that of the moon; for the light of the corona was visible through a thickness of glass which, on trying it on the moon, extinguished the light. The whole scientific world was indebted to Mr. De la Rue for paying such great attention to a branch of science promising such important results, more especially as applied to the delineation of the stars.

The Rev. Dr. ROBINSON thought that the matter ought not to be left with mere praise and admiration of what Mr. De la Rue had done. The means by which the Association had done so much in fulfilling its mission of a benefactor of mankind was by acting uniformly on the principle that, whenever a member was found gifted with peculiar aptitudes and powers, his services should be secured, and himself encouraged to press forward with his work. It was clear that the way was open to a new department of knowledge—that a new instrument of research was at command. Let them avail themselves of it to the fullest extent. They certainly had no right to trespass upon Mr. De la Rue's zeal or time; but he (Dr. Robinson) was sure that if they followed up the question, they might reckon upon Mr. De la Rue's assistance in directing and superintending. He hoped that an application would be made by the Section to the Committee of Recommendations; and he had no doubt that the Royal Society would join in affording the means, to a great extent, of prosecuting the researches so successfully begun.

The PRESIDENT said that it was impossible to over-value the importance of self-registration in all ways. A good many years ago, at his instance, the Association took up the subject of the self-registration of magnetic phenomena, which had been further carried out by the assistance of money from Government. It was certain that, the more recondite observations became, the more it was felt that man was a very poor creature, and that matter was very superior to him. Only put a machine in order to do work and it would do it much better than any man could. Mr. De la Rue had spoken of the precision with which he obtained images of the stars. The precision was so great that the images were so small that they could scarcely be made out—not from want of visibility, but because they were scarcely distinguishable from spots on the collodion. Some time ago, in America, the difficulty was the other way; for, from the state of the atmosphere, the images of the stars were in a constant shake, so that every instant there was a different image, and the result was impressions rather large and blurred. He trusted that the time would come when the transit of stars would be made to register themselves. The means were not wanting; for in America the course of a star across the field of a telescope had traced itself photographically. It would not be difficult to arrange so that this course should refer itself to seconds of time on a transit clock. The image was continuous so long as the light showed itself; but, by galvanic connexions with the beat of the clock, it was possible at every second to stop the light, so that a succession of images would be got, giving a distinct register of time by the star, and thus, to some fraction of a second, it can be fixed when the star passed a given point of view. He wished specially to call attention to one of the photographs—an image with the edge of the sun; and he wished all to observe the rapid degradation of light towards the edge. It was maintained by M. Arago that the light of the sun did not decrease sensibly to the edge—that it was uniform throughout. That was never his (the President's) opinion, and he gave to M. Arago some reasons for differing from him. If M. Arago did not choose to believe him, he had reasons for his doubt; but if he disbelieved the evidence of this photograph he would have no reason for so doing. It was a matter of public scientific importance that the use of the photograph for the things now referred to should be perfected; and, as he fully concurred in what the Rev. Dr. Robinson had said, he thought it was most desirable that the Committee should confer with Mr. De la Rue, with a view of securing that effective and direct superintendence, without which, in such observations, nothing like practical advance could be made.

After several other papers on a variety of subjects had been read and discussed, Professor Smith read the following communication from Mr. Sutton

On the Panoramic Lens.

THE lenses commonly used by photographers for taking views have two grave defects, viz., they give curvature to lines at the margin of the picture which ought to be straight,—and they include too narrow a field of view for a large and important class of subjects. In a paper which I had the honour to read before the British Association at the Meeting in Aberdeen two years ago, I described a symmetrical triple combination of lenses which was intended to remedy the former of the above-mentioned defects. That combination has been found to answer the purpose, and is now manufactured by Mr. Ross, the celebrated London optician. I now beg to lay before the meeting another and a very curious lens, which remedies the latter of the defects named, and produces an optical image which includes an angular field of 100° and upwards in perfect focus to the extreme ends of the picture. This lens, which is an entirely new optical instrument, unlike anything else, I have called a "Panoramic Lens," and I will now describe it.

Imagine, in the first place, a thick spherical shell of glass, having its internal spherical cavity filled with water, and then, since the entire sphere is not required, imagine a central zone of the glass shell removed, and its place supplied by the brass mounting of the lens.

When the above arrangement is fitted with a central diaphragm having a small central aperture, it is evident that the axes of the pencils of light which pass through it must be incident perpendicularly upon each of the four surfaces; and therefore there is no such thing in this lens as an oblique pencil, and the errors due to oblique incidence are completely avoided, and the image formed in every part by direct pencils.

The glass shell, being a lens with concentric surfaces, acts as a concave or diminishing lens, and has positive focal length; while the central sphere of water acts as a convex lens, and has negative focal length. The medium having the *highest* refractive and dispersive power is therefore made into a *concave* lens, while the medium having the *lowest* refractive and dispersive power is made into a *convex* lens. It is possible therefore to render this compound achromatic by giving a suitable radius to the inner surface of the shell. The investigation is extremely simple, and the practical result very neat and convenient. It turns out that when light flint glass is used the lens is achromatic when the inner radius of the shell is about one-half the length of the outer radius. The combination may properly be called a symmetrical achromatised sphere. It is a valuable property of a sphere achromatised in this way that its focal length is greatly increased, so that a large picture can be taken with a tolerably small lens.

The central diaphragm is another curious part of this instrument. It is evident that, if it were merely furnished with a central circular hole, the sides of the picture would be less illuminated than the centre. To meet this inconvenience I have made the central hole elliptical, and have placed in front of it two upright thin partitions, radiating from the centre, and looking like the open wings of a butterfly. These stop some of the light of the central pencil and make it cylindrical, and, at the same time, make the side pencils cylindrical also, and of the same diameter as the central one. This simple contrivance answers perfectly in equalising the illumination, and will be understood by examining the lens which I have sent for inspection.

The image of distant objects formed by a panoramic lens lies upon the surface of a sphere which is concentric with the lens. But the objects of an ordinary view are not all distant ones, for the objects upon the ground are generally much nearer to the lens than those upon the horizontal line. It is found, therefore, in practice, that the best form of focusing-screen to meet the majority of cases which occur in practice is a part of a cylinder having the same centre as the lens, and including about 30° below and 20° above the horizontal line. The panoramic picture, therefore, includes about 100° in width and 50° in height. The upright lines are straight, and the perspective strictly correct in all parts of the picture.

Collodion pictures are taken upon curved glasses, and the negatives printed in a curved printing frame. I have not found any more practical difficulty in working upon curved than upon flat glasses. Everything goes on in the usual way, and the various operations do not occupy more than the usual time.

I am in hopes that the panoramic lens will meet a great want which has long been felt by photographic artists in taking views of natural scenery, since it includes quite as much subject as an artist ever requires in one picture.

I have sent for inspection a complete set of panoramic apparatus, manufactured by Mr. Thomas Ross, and also a negative upon a curved glass, including about 100°, and a print from the same.

Mr. Ross having sent a camera for the purpose of being exhibited to the Section, Mr. Brooke then explained its construction, with which our readers are already familiar. Mr. Brooke also exhibited two negatives,

one on paper and the other on mica. The latter being novel was viewed with much interest; but to the former, as showing the capabilities of the instrument, much exception was taken, and the usefulness of the panoramic lens was stated to be limited to exceptional cases.

Mr. W. T. Mabley said the lens was 5¼ inches focus, and that pictures of 7 inches were taken with it—a thing that had never been accomplished before by any lens.

The President (the Astronomer Royal) said that two considerable difficulties had been overcome by this lens. Everybody knew that in a lens—a thing like a spectacle-glass, only rather more complicated—if you looked askew you could not see an object well. In like manner in a camera the light which came square formed a good image, but the light which came askew did not. By this contrivance of Mr. Sutton's they got something similar in the formation of the image by the light coming in all directions. If the inventor had used glass alone it would not have been sufficient for the purpose; but by the insertion of a quantity of water, which was also in a spherical shape, the lens was achromatised. In the first place there was no injurious effect caused by the light coming from different directions, and in the second place the colour was removed by a simple construction. The lens was a patent, and he thought that the principles upon which it had been constructed had been well applied.

Professor Chevallier said the perspective of a straight line should be a straight line, but in the picture taken with this lens the straight line would be seen to be curved. He wished to ask how this occurred?

Mr. Brooke said it was because the image was taken on a cylindrical surface which was concentric with the lens—consequently the image of all objects would be formed upon that surface, and it would be the same through the whole aperture of the lens as through the ordinary available surface in any ordinary lens.

The President said, in speaking of that lens, it must be remembered that it was panoramic and *not perspective*. In order to see one of the pictures taken by it correctly the eye ought to view it from the centre of the curve.

Mr. Mabley said that was a matter of little importance where the subjects were purely landscapes, and where there were no straight lines they could not detect the fault in the perspective. One great advantage, he apprehended, was that by this lens they could take their pictures in a much less time. They wanted as much light as they could get, and if they worked with a lens of 5¼ inches focus instead of 11 inches, they saved time and got more brilliancy in the picture.

The President said their best thanks were due to Mr. Sutton for his paper, and the subject then terminated.

SECTION B.

Friday, September 6th.

The opening paper at the meeting of this Section, this morning, was one by Professor Miller, bearing somewhat remotely on photography. He introduced it by a few remarks, stating that his object was to exhibit some photographs produced by electric light and sparks, after which the learned professor proceeded to read his paper

On Photographs of Different Spectra of the Electric Light.

The apparatus by which the spectra may be photographed consists of an ordinary camera obscura attached to the end of a long wooden tube, which opens into a cylindrical box, within which is a prism of glass, or a hollow prism filled with bisulphide of carbon. If the prism be so adjusted as to throw the solar rays, reflected from a heliostat, upon the screen of the camera, and the wires which transmit the sparks from Ruhmkoff's coil are placed in front of the uncovered portion of the slit, the two spectra are simultaneously impressed. The solar beam is easily intercepted at the proper time by means of a small screen, and the electric spectrum is allowed to continue its action for two or three or six minutes, as may be necessary.

He did not find that anything was gained in distinctness by interposing a lens of short focus between the slit and the wire which supplied the sparks, with the view of rendering the rays of the electric light parallel like those of the sun, owing to the absorbent action of the glass weakening the photographic effect; and the flickering motion of the sparks being magnified by the lens, rendered the lines less distinct than when the lens was not used. Although with each of the metals (including platinum, gold, silver, copper, zinc, aluminum, magnesium, iron), when the spark was taken in air, he obtained decided photographs, it appeared that in each case the impressed spectrum was very nearly the same, proving that few of the lines produced were those which were characteristic of the metal.

The peculiar lines of the metal seemed chiefly to be confined to the visible portion of the spectrum, and these had little or no photographic power. This was singularly exemplified by repeating the experiment upon the same metal in air, and in a continuous current of pure hydrogen. Iron, for example, gave, in hydrogen, a spectrum in which a bright orange and a strong green band were visible, besides a few faint lines in the blue part of the spectrum. Although the light produced by the action of the coil was allowed to fall for ten minutes upon a sensitive collodion surface, scarcely a trace of any action was procured; whilst, in five minutes, in the air, a powerful impression of numerous bands was obtained.

It was remarked by Mr. Talbot that, in the spectra of coloured flames, the nature of the acid did not influence the position of the bright lines of the spectrum, which he found was dependent upon the metal employed; and this remark had been confirmed by all subsequent observers. But the case was very different in the absorption bands produced by the vapours of coloured bodies: there the nature of both constituents of the compound was essentially connected with the production of absorptive bands.

Chlorine, combined with hydrogen, gave no bands by absorption in any moderate thickness. Chlorous acid and peroxide of chlorine both produced the same set of bands, while hypochlorous acid, although a strongly-coloured vapour and containing the same elements, oxygen and chlorine, produced no absorption bands. Again, the brownish-red vapour of perchloride of iron produced no absorptive bands; but when converted into vapour in a flame this gave out bands independent of the form in which it occurred combined. These anomalies appeared to admit of an easy explanation on the supposition that, in any case, the compound is decomposed in flame, either simply by the high temperature, just as water is, as shown by Grose, or, in all other cases of the production of bright lines by the introduction of a metallic salt into a flame of burning bodies (as shown by Deville). In the voltaic pile the decomposition must of necessity take place by electric action.

The compound gases, protoxide and binoxide of nitrogen, gave, when electrified, the same series of bright bands (as Plucker had shown) which their constituents when combined furnish. Aqueous vapour always gives the bright lines due to hydrogen and hydrochloric acid, the mixed system of lines, which could be produced by hydrogen and chlorine. The reducing influence of the hydrogen and other combustible constituents of the burning body would decompose the salt, liberating the metal, which would immediately become oxidised, or carried off in the ascending current. There was obviously a marked difference between the effect of intense ignition upon most of the metallic and the non-metallic bodies.

The observation of Plucker upon the spectra of iodine, bromine, and chlorine shows that they give, when ignited, a very different series of bands to those which they furnished by absorption, as Dr. Gladstone had already pointed out; but it was interesting to remark, that in the case of hydrogen which, chemically, was so similar to metal, we have a comparatively simple spectrum, in which the three principal bright lines correspond to Fraunhofer's dark lines, C. F. and G. It was, however, to be specially noted that the hydrogen occasioned no perceptible absorption bands at ordinary temperatures in such thickness as we could command in our experiments; and the vapour of boiling mercury was also destitute of any absorptive action, although when ignited by the electric spark, it gave a characteristic and brilliant series of dark bands.

The following experiment suggested itself as a direct test of Kirchoff's theory:—Two gas burners, into which were introduced chloride of sodium on the wick of the spirit lamp, were placed so as to illuminate equally the opposite sides of a sheet of paper partially greased. The rays of the electric light screened from the photometric surface, suitably protected, were made to traverse one of the flames. If the yellow rays of the light were absorbed by the sodium flame, the light emitted laterally by the flame should be sensibly increased. The experiment, however, failed to indicate any such increase in the brilliancy of the flame, possibly because the eye was not sufficiently sensitive to detect the slight difference which was to be expected.

Dr. J. H. Gladstone said he believed the apparent change in colour mentioned by Dr. Miller was no change in reality, but was owing to a defect in our perceptions. When the colour was weak or strong it frequently deceived the eye, and appeared to be of some other colour than the real one.

Mr. Alexander Bryson, optician, Edinburgh, said that he examined the late comet, and he satisfied himself and his friends that they could distinguish the ray D very bright. He thought this was a very remarkable experiment, and he hoped it would be tried again when we were visited by another comet. If his experiment were correct, it certainly proved that the comet's light was self-luminous.

Mr. Warren De la Rue said he believed he was right in saying that the photographic impressions they had seen were generally belonging to that part of the spectrum which was not visible to the eye, and, therefore, photography came out as an important means to the rendering visible phenomena which would otherwise escape their notice. He quite agreed with Dr. Gladstone that colour depended very much upon contrast. He had not himself made any observations upon the comet, but Mr. Alexander Herschel (son of Sir John Herschel), had done so, and he could detect no lines.

SECTION A.

Monday, September 9th.

In this Section Sir David Brewster read two papers, which will no doubt prove interesting to our readers. The first was

On Binocular Lustre.

He commenced by stating that some years ago it was observed by Professor Dove that when the right and left eye figures of a pyramid, or other mathematical solid, the one drawn on a white and the other on a dark

ground, were inserted in the stereoscope, the solid in relief appeared with a particular lustre.

Professor Dove described the lustre as metallic, and, in another place, where he described the diagrams as drawn with white lines on a black ground, and with black lines on a white ground, he stated that the pyramid in relief "appears lustrous as made of cyraphite." Other observers described the lustres differently—some as resembling ground-glass, and others as like paper darkened with a black-lead pencil, while Professor Wood regarded it as "recalling the idea of highly-polished glass."

In order to explain this phenomenon, Professor Dove remarked "that in every case where a surface appeared lustrous, there was always a transparent, or transparent-reflecting, stratum of much intensity, through which we see another body. It is, therefore, externally reflected light, in combination with internally reflected or dispersed light, whose combined action produced the idea of lustre." "This effect," he elsewhere added, "we see produced when many watch-glasses are laid in a heap, or when a plate of transparent mica or talc, when heated red hot, is separated into multitudes of thin layers, each of which, of inconceivable thinness, is found to be highly transparent, while the entire plate assumes the lustre of a plate of silver."

To these examples of lustre produced by these plates—not in optical contact, or if in actual contact, having different reflective powers—were to be added the following: pearls, mother-of-pearl, pearl spar, and composite crystals of calcareous spar, and decomposed glass of all colours. The cause of these various kinds of lustre, and of that of metals, had always been well known; and when binocular lustre attracted the attention of philosophers, it was natural to ascribe it to the same cause. Professor Dove did this, and considered the dark surface in the one picture as the dispersed light, and the white surface as the regularly reflected light, the dark surface being seen through the white surface.

This theory of binocular lustre, he had reason to believe, was not satisfactory. The phenomenon was first observed by himself in 1843, under conditions of different forms than those under which it was subsequently seen in the stereoscope. Having adverted to a paper *On the Knowledge of Distance given by Binocular Vision*, published by himself in 1844 in the *Edinburgh Transactions*, he said that with his knowledge of the phenomenon he could not adopt Professor Dove's explanation of the lustre seen in the stereoscope by the union of figures on dark and white or differently-coloured surfaces.

In order to test this explanation by other means, he combined faces that had no geometrical figures upon them, and he found that binocular lustre was not produced. This experiment seemed decisive of the question. He was led to infer from it that the lustre observed in the combination of right and left eye figures of solids was not due to the rays from a dark surface passing through a lighter one to the eye, but to the effect of the eyes in combining the two stereoscopic figures, and to the dazzle occasioned by the alternating intensities of the two combined tints, the impression of one of the tints sometimes disappearing and reappearing.

He referred to an article published by Professor Road, of Troy, on his (Sir David Brewster's) *Theory of Lustre*, and which he disavowed, not having adopted any "theory of lustre." He had merely started an objection to Professor Dove's theory of binocular lustre, and an opinion regarding its cause; and, as the simple experiment on which he founded that opinion had been made by others with a different result, he thought it right to re-examine the subject with the assistance of other eyes than his own, and had obtained results which might be of use to those who were disposed to study the subject more elaborately. Binocular lustre was a species of lustre *sui generis*. It was a *physiological*, not a *physical* phenomenon, and had no relation whatever to those varieties of lustre which arose from the combination of lights reflected from the outer and inner services of luminated, transparent, or translucent bodies.

He assigned various causes for the physiological character of the phenomenon, and then added:—"If binocular lustre arise from a physiological and not from a physical cause, we must look for this cause in the operations which take place in the eyes of the observer when binocular lustre is distinctly seen."

These operations are of two kinds. First, in combining geometrical or other figures to represent solids whose parts are at different distances from the eye, the optic axes are in constant play, not only in varying the distance of their focus of conveyance to unite similar points at different distances on the two diagrams, but in maintaining the unity of the picture by rapidly viewing every point of its surface. Secondly, when the two surfaces have different shades or colours, the retina of one eye is constantly losing and recovering the vision of one of them. Each optic nerve is conveying to the brain the sensations of a different tint or colour. The brain is therefore agitated sometimes with one of these sensations, and sometimes with the other, and sometimes with both of them combined; and it is therefore not an unreasonable conclusion that, in the dazzle produced by this struggle of flickering sensations, something like lustre may be produced.

In studying the subject of lustre there are some facts deserving of attention. In a daguerreotype, for example, of two figures in black bronze, with a high metallic lustre, it is impossible, by looking at either of the pictures, to tell the materials of which they are made. No lustre is visible; but, when the two equally-shaded pictures are combined in the stereoscope, the lustre and the true character of the material is instantly seen.

Another instructive example is seen in the stereoscopic representations of a boy blowing a soap bubble. The lustre of the watery sphere is not visible in either of the two pictures; but when they are combined it is distinctly seen. In both these cases, and others of the same kind, tints of similar intensity are combined, and there is no ground for assuming that the two surfaces combined appear at different distances, and that the one is seen through the other, as in Professor Dove's theory.

Mr. Cornelius Varley, of London, remarked that the mind could not attend to two things at once. Now, in the stereoscope, the eyes were forced to see two things, and whenever lustre was produced it was a species of dazzling which rendered the eye unsteady, and the mind was forced to see white and black alternately and unwillingly. Mr. Varley added that the first artist who attempted to teach his brother artists how to produce lustre was Hogarth.

In answer to a question, Sir David Brewster stated that he was not able to say that the instantaneous appearance of a solid could be obtained by the educated eye. After seeing the solid with both eyes, if one eye were shut the observer continued to see the solid for a certain time.

Sir David Brewster's second paper was

On Photographic Micrometers.

When examining, several years ago, some microscopic photographs executed by Mr. Dancer, a celebrated optician in this city, I was struck with the singular sharpness and opacity of some of the lines in such of them as were copies from engravings. The idea occurred to me of obtaining, photographically, by means of the camera, "micrometrical scales, or systems of delicate lines, opaque or transparent, and fitted both for astronomical and microscopical purposes."

This suggestion was published, in the following terms, in the article *Micrometer*, which was published in the *Encyclopædia Britannica* :—*

"Mr. Dancer, of Manchester, has succeeded in making photographic portraits on collodion, so small that they are wholly invisible to the naked eye, and that ten thousand portraits may be introduced into a square inch. The film of collodion on which these photographs are taken is so thin and transparent that it is invisible, and allows objects to be seen through it as distinctly as if it were the thinnest glass. If a system of opaque or transparent lines, therefore, be impressed upon it photographically, when reduced to the minutest size, from a system of large and sharply-defined lines, we shall have the most perfect micrometrical scale that can be conceived, the portion of collodion that contains no nitrate of silver being as transparent as if the dark spaces were solid wires or metallic plates placed in the focus of the eye-glass."

In another part of the article I have described a photographic position micrometer, in which the dark lines may be formed on collodion or albumen, at fixed angles, succeeding one another like Arago's prisms, by angles differing 30″, 15″, or even 5″. These lines may converge to points within or without the field, or even to points at great distances; and in this case their inclinations may be accurately determined, in the large or unreduced copy, by a divided circle furnished with a vernier, and read off by microscopes. A moveable photographic line on a plate of collodion may have a motion close to the plate, so that both may be equally distinct.

From these considerations it is obvious that we may construct, photographically, the various *reticula*, or *reticles*, as they have been called, used by Cassina, Bradley, La Caille, Mr. Wollaston, and M. Valz, of Nimes, as well as the net micrometer, the concentric circle micrometer, the suspender micrometer of Fraunhofer, and the lineal and circular micrometer of Cavalla, and others drawn upon mother of pearl.

In the number of the *Philosophical Magazine* for August, 1861, p. 166, Dr. Woods, of Parsonstown, has suggested the construction of photographic micrometers, without being aware of what had been published on the subject.†

SECTION G.

Tuesday, Sept. 10th.

Colonel Sir Henry James, R.E., read a paper

On Photozincography.

He said that by this discovery they could now transfer a photograph direct to a zinc plate, and so produce any number of copies. The Government having decided that it was necessary to reduce the large copy of the survey to a small one, and which would involve a great outlay, he made an attempt to accomplish this without resorting to engraving, and perfect success had been achieved. He described the details of the process, and exhibited several copies of *Domesday Book* so printed. The fidelity of the copies was shown by the fact that every defective type was accurately represented. A large mechanical drawing could be reduced to any size, and produced at an exceedingly cheap rate. Having already given full details of the process in this Journal, we need not repeat them here.

Mr. Vignoles thought that there had not recently been any more valuable discovery for engineers, geographers, &c., than that of Colonel James and his coadjutors. It had saved the government £100,000.

* Vol. XIV., pp. 745, 756, 758 note, and 759.

† Dr. Woods's communication will also be found in The British Journal of Photography for August 15th last, page 289.

REPORT OF THE KEW COMMITTEE.

We extract some interesting items from the Report of this important Committee, showing the photographic work performed during the year. The story of the Expedition to Spain to secure photographs of the eclipse, and the details of the preparations made to ensure complete success, should find a permanent place in our report of the proceedings of the British Association.

At the last meeting at Oxford it was announced that the Kew heliograph was about to be transported to Spain for the purpose of photographing, if possible, the so-called red flames visible on the occasion of a total solar eclipse. That the mission had most successfully accomplished the object contemplated was known in England on the morning of the 19th of July, 1860 (the day after the eclipse) by the publication of *The Times* newspaper of a telegram sent by Mr. Warren De la Rue from Rivabellosa, near Miranda, where the Kew party were stationed.

It will be remembered that, at the suggestion of the Astronomer Royal, the Admiralty had placed at the disposal of the expedition of astronomers H.M.S. *Himalaya*, and that the Government Grant Committee of the Royal Society had voted the the sum of £150 for the purpose of defraying the expenses of transporting the Kew heliograph, with a staff of assistants, to Spain.

As the scheme became matured, it was deemed desirable to extend considerably the preparations originally contemplated, and actual experience subsequently proved that no provision which had been made could have been safely omitted. Originally it was thought that a mere temporary tent, for developing the photographs, might have answered the purpose; but on maturing the scheme of operations it became evident that a complete photographic observatory, with its dark developing room, cistern of water, sink, and shelves to hold the photographs, would be abolutely necessary to ensure success. An observatory was therefore constructed in such a manner that it could be taken to pieces and made into packages of small weight, for easy transport, and at the same time be readily put together again on the locality selected. The house, when completed, weighed 1,248 lbs., and was made up in eight cases. Altogether the packages, including house and apparatus, amounted in number to thirty, and weighed 34 cwt.

Besides the heliograph, the apparatus comprised a small transit theodolite for determining the position of the meridian, and ascertaining local time, and the latitude and longitude of the station; and also a very fine three-inch achromatic telescope, by Dallmeyer, for the optical observation of the phenomena of the eclipse. Complete sets of chemicals were packed in duplicate in separate boxes, to guard against failure through a possible accident to one set of the chemicals. Collodion of different qualities was made sensitive in London, and some was taken not rendered sensitive, so as to secure as far as possible good results. Distilled water, weighing 129 lbs., had to be included; and engineers' and carpenters' tools, weighing 113 lbs., were taken.

Mr. Casella lent some thermometers and a barometer, and Messrs. Elliott an aneroid barometer, to the expedition.

The preparations were commenced by Mr. Beckley (of the Kew Observatory) early in the year 1860; and in June Mr. De la Rue engaged Mr. Reynolds to assist Mr. Beckley in completing them.

Mr. Beckley and Mr. Reynolds were charged with the erection of the observatory at Rivabellosa; and so well were the plans organised that the observatory and heliograph were in actual operation on the 12th of July, the expedition having sailed from Plymouth in the *Himalaya* on the morning of the 7th. This could not, however, have been so expeditiously accomplished without the energetic co-operation of Mr. Vignoles, who met the *Himalaya* in a small steamer he had chartered to convey the expedition and their apparatus into the port of Bilboa, and who despatched the Kew apparatus, as soon it was landed, to the locality he and Mr. De la Rue had agreed upon. This was situated seventy miles distant from the port of landing, and accessible only through a difficult pass. Mr. Vignoles had also taken the trouble to make arrangements for accommodating the Kew party, and for the due supply of provisions—a matter of some importance in such a locality.

Besides Mr. De la Rue, Mr. Beckley, and Mr. Reynolds, the party consisted of Mr. Downes and Mr. Beck, two gentlemen who gave their gratuitous services, and of Mr. Clark, who acted as interpreter, also kindly assisting during the eclipse. Each of the party had only one thing to attend to, and thus rapidity of operation and certainty of result were secured.

The total expenditure of this expedition amounted to £512; the balance of £362 over the amounted granted by the Royal Society has been generously defrayed by Mr. De la Rue.

Upwards of forty photographs were taken during the eclipse and a little before and after it, two being taken during the totality, on which are depicted the luminous prominences with a precision impossible of attainment by hand drawings. The measurements which have been made of these prominences by Mr. De la Rue show incontrovertibly that they must belong to the sun, and that they are not produced by the deflection of the sun's light through the valleys of the moon. The same prominences, except those covered over during the moon's progress, correspond exactly when one negative is laid over the other; and by copying these by means of a camera, when so placed, a representation is obtained of the whole of the prominences visible during the eclipse in their true relative position. The photographs of the several phases of the eclipse have served to trace out the path of the moon's centre in reference to the sun's centre during the progress of the phenomenon. Now, Rivabellosa being north of the central line of the moon's shadow, the moon's centre did not pass exactly across the sun's centre, but was depressed a little below it, so that a little more of the prominences situated on the north (the upper) limb of the sun became visible than would have been the case exactly under the central line, while, on the other hand, a little of those on the southern limb was shut off. It has been proved by measuring the photographs that the moon during the totality covered and uncovered the prominences to the extent or about 94″ of arc in the direction of her path, and that a prominence situated at a right angle to the path shifted its angular position with respect to the moon's centre by lagging behind 5° 55′. On both the photographs is recorded a prominence, not visible optically, showing that photography can render visible phenomena which without its aid would escape observation. Copies of the two totality pictures are being made to illustrate Mr. De la Rue's paper in the report of the *Himalaya* expedition by the Astronomer Royal.

Positive enlarged copies of the phases of the eclipse, nine inches in diameter, have also been made by means of the camera, and will be exhibited at the Manchester meeting.

The heliograph has since been replaced in the observatory, but few opportunities have occurred for using it in consequence of the pressure of other work; latterly, however, Mr. Beckley has been requested to carry on some experiments with the view of ascertaining whether any more details are rendered visible when the full aperture of three inches of the telescope is used than when it is reduced to about one inch-and-a half. Up to the present time no definite conclusion can be drawn from the results obtained; so that, at all events, an increase of aperture does not appear to give a strikingly better result when a picture of the same size is taken with various apertures of the object glass. More experiments, however, are needed, before this point, which is one of some importance in guiding us in the construction of future instruments, can be answered definitely. Mr. Beckley has obtained sun pictures of great beauty during the course of these experiments.

The work of the Kew Observatory is now so increased that it has become absolutely imperative to make some provision for working the heliograph in a way that will not interfere with the current work of that establishment; and Mr. De la Rue has been requested by his colleagues of the Kew Committee to take charge of the instrument at his observatory, where celestial photography is continuously carried on. This request Mr. De la Rue has kindly acceded to; and he will for a time undertake to record the sun spots at Cranford, as long as it is found not to interfere with his other observations.

Mr. De la Rue has contrived, and had made by Messrs. Simms at his own expense, an instrument for measuring the photographs, which will much facilitate the reduction of the results. It consists of a fixed frame in which work two slides, moving at right angles to each other. Each is furnished with a vernier reading to $\frac{1}{1000}$th of an inch. The top slide works on the lower slide and carries a hollow axis 4½ inches diameter, on which rotates horizontally a divided circle reading to 10″, and this carries a second circle on the face of which are fixed four centering screws. An image intended to be measured is placed on the upper circle, and is centred by means of the adjusting screws; it is then adjusted by means of the upper circle in any required angular position with respect to the lower divided circle, so as to bring the cross lines of the photograph in position under a fixed microscope, supported on an arm from the fixed frame. By means of this instrument the sun pictures are measured so as to determine the diameter to $\frac{1}{2000}$th of the radius; the angular position of any part of the sun spot and its distance from the centre are thus readily ascertained; or the differences of the right ascension and declination with respect to the centre are as easily read off to the same degree of accuracy.

Mr. De la Rue has recently produced, by his large telescope, an image of a solar spot and portion of the sun's disc far superior to anything before effected, and which leads to the hope that a new era is opened in heliography, and that the resources of this observatory might be further developed in that direction.

At the last meeting of the Association the sum of £90 was voted for an additional photographer, and of this sum £50 has been received. The Committee suggest that the balance of £40 be granted again at this meeting, as the full sum will be required during the ensuing year. A detailed account of this expenditure will be presented in the next annual report.

Allusion was made in the last report to an instrument constructed by Professor William Thomson, of Glasgow, for determining photographically the electric state of the atmosphere. This instrument has been fitted up at Kew, where it has been in constant operation since the beginning of February last. It has been found to answer well in a photographic point of view, and Professor Thomson has expressed himself much pleased with the results obtained. The mechanical arrangements connected with the fitting-up of this instrument were devised and executed with much skill by Mr. Beckley, the mechanical assistant, who has also recently made a working drawing of the instrument for Professor Thomson, who intends to publish a description of it.

GRANTS FOR SCIENTIFIC PURPOSES.

At the meeting of the General Committee on Wednesday, the report of the Committee of Recommendations, as far as money grants are involved, was read and adopted. The following grants were among those agreed to:—

That £500 be appropriated, under the direction of the Council, for maintaining the establishment at Kew.

That £40 be granted to the Kew Committee, for the employment of the photo-heliometer.

That the co-operation of the Royal Society be requested in obtaining a series of photographic pictures of the solar surface, and that £150 be granted for that purpose.

Mems. of the Late Meeting.—The next meeting of the Association is fixed to be held at Cambridge, in June next, the Rev. Prof. Willis to be President, and the Rev. W. Hopkins, M.A., F.R.S., Assistant General Secretary.——At the conclusion of the admirable address of the Astronomer Royal on the great solar eclipse, Mr. Warren De la Rue projected upon a screen the two photographs he had taken of the eclipse. These excited much admiration and applause. He also exhibited a series of views of the prominences, &c., as witnessed by other observers.——Mr. A. Brothers, of Manchester, is about to produce a group of photographs of members of the Association, for which purpose that gentleman has already secured sittings from a large number of the more distinguished members.——In its opening remarks on the recent meeting of the British Association, our contemporary, the *Athenæum*, speaks of the Association having been "blessed with brilliant weather!!" A friend of ours remarked that Manchester was the only place to which he took an umbrella, and every member who was *present* could testify to the wisdom of our friend's foresight; for during the first few days there were "cloud tears" in such abundance that the members became adepts in the "wet process" quite naturally.

ON THE SPECTRUM ANALYSIS.

By Professor W. A. Miller.

[Abstract of a Lecture delivered before the British Association at Manchester, September 9th, 1861.]

Professor Miller said the subject which the Council of the Association had desired him to bring before the meeting was one which, amongst the scientific questions of the day, had attracted as large a share of popular attention as any that could be named It appealed to the imagination so powerfully—it revealed to us matters of investigation much in the same way as the telescope made known to us what was passing in distant worlds, bringing before us not only those particular changes which appeared to be going on in the bodies which compose our solar system, but it appeared also further to reveal to us something of the nature of those distant solar orbs which stud the firmament.

Not only, however, did it make known those wonders at a distance, but, like the microscope, it revealed to us also quantities of substances so minute that they would defy any other mode of investigation: it made known to us bodies which not only would defy, but up to the present time had defied, all the sources of analysis and chemical skill. He thought he should best discharge the duty which devolved upon him if he endeavoured to bring before them in an exceedingly brief manner the successive steps by which this discovery had been made.

Like all other great discoveries, it was not the work of one individual. It was a work in which, he was proud to say, their own countrymen had taken a prominent part, and many of the members of the British Association had laid the foundations of our knowledge on this point. Newton communicated the first information upon this subject in 1701. We knew nothing of the solar spectra till Newton revealed it in his great work on optics in that year, his researches having occupied him many years previously. He would first bring before the audience the spectrum as seen by Newton (not that Newton had the means of producing that artificial light which on that occasion he should employ), gradually bringing them up to the present time. The spectrum was perhaps the most glorious sight the eye could behold.

Professor Miller then directed a beam of white light upon the wall from an electric lamp, and afterwards directed it, through a prism, to a screen on the platform prepared for the purpose. The beautiful prismatic colours on the screen drew forth indications of approbation from the audience. The Professor then went on to say that in the solar spectrum dark lines or bands were discovered by Wollaston in 1801; and the distinguished German philosopher, Fraunhofer, discovered dark lines crossing the spectrum at right angles to its length. Those lines were made whatever was the material used in the prisms.

He would for a moment anticipate his subject by thirty years, in order to show a photographed spectrum on a surface of collodion. This image, it would be seen, was not continuous, but was intersected by bands more or less bright. This he showed, in order that his audience might understand what he meant when he referred to Fraunhofer's black lines in the solar spectrum, upon the nature of which much speculation had been exercised. The point next to remember was that other lights than that of the sun also exhibited these lines. For instance, if a solid substance were heated up till it gave out light, as all solid bodies would when sufficiently heated, these solid bodies—whether the ball of lime in the oxyhydrogen light or the charcoal in the electric light—they exhibited broken spectrum, being crossed by bright lines. This led him to several distinct lines of research followed by Fraunhofer:—first, the lines in the solar spectra, which he might call cosmical; next, lines produced by the process of absorption. For the discovery of these lines we were indebted to one of our most illustrious philosophers, who was with them on that occasion—Sir David Brewster. Then there were a series of lights produced by coloured flames. Lastly, there was a series of lines—for the knowledge of which they were mostly indebted to Professor Wheatstone—the lines produced by the electric spark. Wollaston and Fraunhofer noticed that the electric spark produced spectrum, but they went no further. Professor Wheatstone had, however, done so. He had no opportunity of presenting to the audience any of the cosmical lines beyond those he had already shown in the photograph. Sir David Brewster was the first person to throw a light on these lines. He observed that under certain circumstances the sun's rays were absorbed. It appeared certain that particular rays were deepened by the absorbing action of the earth's atmosphere.

Then came the beautiful discovery of Becquerel, in 1842, by which it was made known that there was the same interruption, or black lines, in phosphorogenic rays; and Stokes a few years afterwards showed that the rays which produced fluorescence were interrupted precisely in the same way. But no one had satisfactorily explained the cause of these lines.

He would now lead his audience a second step, for which they were also indebted to Sir David Brewster. He discovered that the dark orange coloured gas, nitric oxide, had a very remarkable absorptive power upon the sun's rays. This brownish-red gas, placed in a ray of light, and afterwards examined by the prism, showed a series of black bands much more distinctly than those occurring in the sun's light. The moment he put this gas into the course of the ray it produced the black lines. A good many other gases had similar effects.

The next point of interest was observed by M. Foucault, a Frenchman, who found that by sending the sun's rays through the electric light, we got a black band where the electric light showed a bright one. This led to the discovery which formed the subject of the present discourse.

The next step was the discovery of the spectra of coloured flames. In 1822, Sir John Herschel made a series of observations upon coloured lights; and it appeared to Talbot that these observations might be turned to account for chemical analysis.

Professor Miller then showed by experiment the observations made by Mr. Talbot upon lithium and stronchium, the flames of which were so closely allied in colour that when viewed by the unaided eye but little could be seen to distinguish them one from the other; but the moment they were viewed through the prism there was a marked and striking difference in the bands. Mr. Talbot pointed out that soda and potash gave out very peculiar spectra. It did not matter what preparation of potash was used, the result was the same. In the case of the spectra of the alkaline earths the lines were very numerous. A map (of the spectra) here pointed to was one published by Bunsen and Kirchhoff: another, going much more into detail, had been published by himself.

Passing on to another point of great importance, Mr. Swan, he said, was the first person who endeavoured to estimate the delicacy of these reactions; and he showed that so minute a quantity as the one two-millionth and a-half part of a grain of a salt of sodium could be detected by the colour of its flame. Other points also were investigated by Mr. Swan.

The next step was with reference to the spectra of the electric light; and here Mr. Wheatstone gave the first impulse to discovery. In the year 1835 he showed, at Dublin, a map of various spectra produced by the electric sparks passed between different metals, and he discovered the very important principle that each metal had its own peculiar spark, alike whether the electricity employed were voltaic, magnetic, or from the common electrical machine. He further showed these phenomena were not due to the burning of the metals; for he performed his experiments in an air-exhausted vessel, and he put carbonic acid in the vessel and still found the same light. He also examined metals in their melted state, and the spectra of one or two of these the lecturer here showed.

The barium spectrum having been exhibited parenthetically, Professor Miller went on to display Mr. Wheatstone's spectra of lead and tin; and he stated that Mr. Wheatstone's investigations had led to the offer of a prize for further investigation, Mr. Wheatstone having been at that time engaged with his electric telegraph. This prize was won by M. Macon, who published from 1851 to 1855 some important papers on this matter, with engravings of the spectra, giving much more complicated lines than those given by Mr. Wheatstone.

Having displayed the spectrum of silver, the learned lecturer proceeded to refer to further experiments made by an American discoverer, and others, whom he named. Amongst these were a number of curious observations on the spectra of gases in tubes first filled with these gases, and then as much as possible exhausted. On the table in front of the platform stood an apparatus, consisting mainly of two such tubes, the one containing hydrogen, the other nitrogen, both in imponderable quantities. Electric light passed through these tubes gave, in the one case, a vivid red; in the other, a brilliant blue. It was also found that if two pieces of wire, having on them the least trace of lime, or baryta, or soda, were subjected to the electric spark passing between them, the characteristic spectra of those metals were produced. Nobody up to that time had explained the relation of these different facts with the other. M. Kirchhoff, and, simultaneously, Mr. Stewart, investigated the nature of radiant heat—the vibration produced by different degrees of temperature; and both concluded that when a substance was heated it gave out a certain set of rays which, when cold, it absorbed; or *vice versa*.

Having exhibited the light of sodium under the two conditions, to show the contrast, Professor Miller next remarked that the black line in the spectrum before them was as the key-note to the whole of Kirchhoff's explanation. The light absorbed there was not lost; it was radiated in all directions instead of being cast on the screen. Kirchhoff proved by theoretical deductions that the dark bands in the solar spectrum were the reverse of the bright bands, and found he could reverse the bright bands, not only of sodium, but of lithium, potassium, barium, and strontium, by putting their flames in the course of the sun's rays.

Turning to stellar matters, Kirchhoff had said, with great probability, that the spectra of Fraunhofer were merely the bright lines which we should see if there were not an intensely heated body in the atmosphere of the sun producing these dark lines. Fraunhofer's opinion was that, in the luminous atmosphere of the sun, vapours of various metals were present; and that the solid body of the sun behind the luminous atmosphere, emitting rays of all degrees of refrangibility, caused these lines to be observed. Kirchhoff had arranged an extremely sensitive apparatus, by means of which he had been enabled to magnify the solar spectrum in such a way that he could get a spectrum eighteen feet in length, and view every part of it with a microscope.

Sir David Brewster and Dr. Gladstone had recently made known the existence of at least two thousand black lines in the solar spectrum, but Kirchhoff estimated them as very much more numerous.

Showing then a map of the solar spectrum, Professor Miller said that amongst the lines thus exhibited were a large number corresponding exactly to the lines produced by known metals; and he pointed to and described the drawing of apparatus whereby at once the lines of the solar spectrum could be seen simultaneously and compared with the lines characteristic of mundane metals. Every star had its own series of lines, some of them seeming to show sodium. The sun appeared to contain sodium, potassium, iron, chromium, nickel, and magnesia. Bunsen, in observing the residue of the water of a certain spring, found spectrum lines which he had never seen before, and supposed them to be due to the presence of an unknown metal, which he afterwards was able to isolate, finding that three grains (only) of it were extractable from a ton of the water. From the beautiful blue lines in the spectrum produced by this metal he named it cœsium.

By the kindness of Professor Bunsen, who had complied with Professor Roscoe's request for a specimen, the lecturer was enabled to exhibit the spectrum lines of this new metal; and Professor Roscoe had also supplied him with a sample of another new metal thus discovered, named "rubidium," the spectrum of which he also threw on the screen.

Record of Photographic Inventions.

By Samuel Highley, F.G.S., F.C.S., &c.

[Notice.—Under the above title it is proposed to describe from time to time such inventions and applications as may be of interest to photographers, whether they be of great or minor importance, and also to compare the relative merits of two or more contrivances designed to effect the same purpose. Where it is possible we shall, as a rule, describe the objects that we think worthy of finding a place in these columns after a personal inspection of the same. It is therefore requested that manufacturing, professional, and amateur photographers will call our attention to their inventions as soon as they are ready to place them before the public, whether they be lenses, cameras, stands, tents, operating boxes, printing apparatus, preservative cases, enlarging apparatus, stereoscopes, novel methods of fitting-up glass or developing rooms and their appurtenances, artificial sources of light, &c., or the applications of photography to technical or useful purposes. If the inventors be resident in the country, it is requested that they should forward with a simple description of the object a photograph, stereograph, or drawing, to facilitate and ensure a perfect comprehension of the same.]

PROFILED STUDIO BACKGROUNDS.

We have lately paid a visit to Messrs. Bull's, of Great Queen Street, Lincoln's Inn Fields, the paper stainers and painters of theatrical scenery, to inspect a very neat arrangement they have just introduced for the purpose of economising space, whilst giving the effect of rotundity to those accessories of the photographic glass portrait room which, as usually constructed, occupy much bulk. In the first place there are backgrounds of various designs, such as landscapes, open French windows looking out on to street vistas, panelling, &c., painted on flat canvas, mounted on rollers fixed against the wall, after the manner of map cases; so that any character of background can be given at the will of the operator or according to the wishes of the sitter, at a minute's notice. Besides these, there are a set of "profiled" columns, balustraded pillars, vases or mantle-pieces, bookcases, looking-glasses, which are painted on the flat, with a proper view to perspective, mounted on wood, and cut out in outline, after the manner of set pieces at a theatre. These are only of the thickness of the wood on which they are mounted, and are kept in an upright position by a hinged flap, which shuts flat when the particular piece is not in use to facilitate its being stowed away. Thus, with a landscape background, a column may be placed on one side, the balustrade in the centre, and a short pillar at the end as a finish, to give an idea of a person standing outside the portico of a romantically-situated country house; or by fixing a vase-piece on the short pillar, and replacing the column of the other pillar with another vase, a garden terrace can be represented; and so a variety of changes can be rung, according to the taste and ingenuity of the photographer. If the pannelled background be drawn down a portion of a profiled mantle-piece can be placed on one side and a profiled bookcase on the other, as side scenes, or the pillar and column may be made to replace either of these, and so on. Variety may again be effected by the addition of drapery. We have said that the vases may be fixed on the pillars at will. These are so placed, in reference to the painting of the top of the pillar, that the vase seems to stand upon it, when depicted in the photograph, and, by an ingenious thought, the painted *shadow* of the plinth of the vase is attached to the profile, so that it may produce the proper perspective effect when combined with other elements of the set of accessories. Judgment must be used by the arranger of the "set-piece," so that the shadow of his model may fall in the same direction as the shadows on the painted background, and that the various parts be so combined as to produce *a finished* effect; for among the photographic specimens contributed by various purchasers of these "properties," we noticed some curious blunders, that indicated not only a want of taste, but also a want of common sense on the part of the photographer. Not only do these profiles possess the advantage of occupying little room in the studio, but they are so light that a child might move them into position; and another consideration is, that they are considerably cheaper than the "built-up" pillars, balustrades, &c., we are as yet acquainted with. It may also be remarked that when solid models of such accessories are included in the range of a portrait lens, from the various planes being more or less out of focus, the best result is not always produced in the photograph, whilst by Messrs. Bull's arrangement this difficulty is reduced to a minimum, as all details are in one plane, or nearly so; and judging from various photographs of these models that we have inspected, we are able to say that very satisfactory and artistic results can be thus produced. We recommend all those who intend fitting up or making additions to their studio to pay a visit to Great Queen Street.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

Importance of Atmospherical Truth—How Most Commonly Violated in Photographs—Value of the Aërial Tones, &c.

"A great artist is one who knows how the landscape will appear under varied effects. He thinks no trouble too great, no hill too high or steep to climb. Difficulties to be surmounted only increase his ardour. *You also must discard laborious idleness, and* avoid using your hands while your head is idle."—*G. Barnard.*

"It is the proper study and labour of an artist to uncover and find out the latent cause of conspicuous beauties, and from thence form principles for his own conduct."—*Sir J. Reynolds.*

My Dear Fellow-Student,

In my last I pointed out, as the commonest source of untruth in photographic productions, the want of real aërial perspective, and traced such rather to the defective pictorial education of the photographer than to any radical error in his optical appliances. In my present letter, therefore, we may as well proceed to consider the vital importance of this the first and greatest element of pictorial truth, beauty, and harmony in the productions of landscape art.

Camera landscapes have two most frequent and prominent sources of error, arising, in the one case, from the improper use of a lens, or the use of one unfit for its work; and, in the second, from some kind of mismanagement on the part of the operator. In the one case the effect of atmosphere is peculiarly exaggerated, and in the other it is altogether absent. In a photograph exhibiting an error of the first kind the critical eye at once detects a something false and offensive, even although its cause may escape observation. But a little consideration must suffice to show that the misty appearance veiling all objects retiring beyond a certain plane is not unnatural in consequence of the opacity of the air, or of a want of more vigorous definition in the objects, but in consequence of wanting the proper *gradation or truth of aërial tone.* In such productions, while the semi-opacity of the atmosphere is so very strikingly apparent in the more retiring planes of the picture, in the more advancing the atmosphere seems *unusually clear and transparent.* There can, of course, be neither truth, harmony, or real beauty in such miscalled landscape pictures. Using a portrait lens, or one which has not sufficient "depth of focus" (?) is a fruitful source of such defects.

In the other case, where there is an entire absence of atmospherical truth, the defect is attributable rather to the operator than to the faults of his instrument or process; and so common is this species of untruthfulness in photographs, that a strong and popular belief asserts atmospherical effects to be beyond the compass of our art. The best thing *some* of our landscape photographers could do for the improvement of their productions would be to join a rifle corps, and pay more than usual attention to the "judging distance drill," as they would thus learn how, apart from diminution in size, distance is also indicated with equal force by the variety of appearance due to the character and the amount of intervening air; or, in other words, they would see that *aërial* is of no less importance in securing truthfulness than *linear* perspective. Each receding plane has its distinctive scale of aërial tones, and when all such are visible, say in a level country, unbroken by hill or valley, from the foreground to the distant objects against the horizon, so subtle are

the relative gradations of tone which blend or unite the various planes of distance that the eye cannot detect either the beginning of one or the ending of another. The absence of aërial perspective most frequently arises from extending the depth of definition over too remote a field, although, as I pointed out in my last, there are other causes productive of defects bearing the same character.

Now, having power to limit or extend the definition, or, in other words, to secure or destroy aërial perspective, how essential is it that we should educate the eye to *recognise* the quality we are seeking for our pictures!

These aërial tones are of the utmost importance to the artistic student of landscape art, as being the primary source of that harmony or unity of parts which constitutes the great aim of the painter in all his best works, as well as the chief means we have for representing space and relief.

In the landscape these atmospherical tones represent that which expression does in the portrait—viz., its life or soul—and the photograph which lacks them is proportionately cold and lifeless. The ever-changeful and rapidly-varying expressions of nature are as important to the landscape artist as the continually-shifting expressions of the human countenance are to the portraitist; and just as a mere copy of the features devoid of expression is said to be simply "a map of a face," so a mere representation of the objects forming a landscape view is a mere map of a scene.

Again, just as the portraitist, endeavouring to avoid the death or statue-like seeming of an expressionless face, yet does not seize upon *any* expression simply because it gives life, but strives anxiously to secure something beyond one of an ordinary or commonplace character, so should the landscape artist look for such expressions in Nature as indicate her happiest moments, when the combination of atmosphere and light, blending harmoniously in the expression of sentiment or feeling, convey thought to the mind of the spectator, and so fulfil the intellectual mission proper to all real art.

When, in some truly picturesque subjects, *we feel*, rather than *see*, the subtle and refined elements of harmony, so largely represented by these aërial tones, intermingling their peculiar expression or sentiment with every separate part of a landscape composition, the effect is very analogous to that of some sweet and soul-refining melody which, stealing through the ear into the heart, awakens novel feelings of pleasure, and seems to soften and improve our whole nature; for, just as the enchantments of musical harmony excite our feelings through the channel of hearing, so through that of seeing do the glorious harmonies of tone and colour reach the mind. Every lover of Nature, and Nature's poetry and beauty, will at once understand this, and appreciate the importance of my subject. Of this you may be sure, that without atmospherical truth there can be no complete expression of "the grand or beautiful objects of natural scenery."

A genuine landscape, embodying the spiritual truths of the air, as well as the material realities of form, has indeed no small power over the mind. We may contemplate such for any length of time without satiety. Its interest never flags, because the longer we look the more numerous are the associated ideas which come and go before the mental eye. It renews even the fresh young feelings through which the delighted old man first communed with nature in early life. It calls up old experiences of pleasant country rambles; carries us through the windings of the fresh and cool green lane, dappled with quivering light and shade, until we explore scenes which memory alone has painted on the retina of the imagination; carries us out and beyond the misty depth of the retiring vista in the woodland view, or, bearing the glance far into the vast region of the luminous air, makes the sun-irradiated clouds seem to float slowly on through the lucid and transparent sky, while foliage trembles in the gentle breeze, and the whole scene is brilliantly redolent of life, and motion, and light, and—Air. How superior is *such* a really *truthful* landscape—appealing at once to the memory and the imagination, begetting fresh thoughts, and opening the mind to new beauties—when compared with the cold exactness of those inert imitations in which near and distant forms and details are unduly prominent, and in which each discordant part seems struggling for superiority over the rest, or in which, to use other words, the harmony and subordination of Atmospherical Truth is entirely wanting! Such productions may boast a fictitious exactness, specious in effect, and strikingly apparent to the unthinking spectator; but they are as entirely and mischievously false to Nature as to the higher aim and purpose of true landscape art.

Photography is, as I am continually asserting, by no means necessarily a mechanical application of pictorial art. Exactness of form and detail are qualities above all others indispensable to scientific representations; but if such are the loftiest requirements of this our art, then, indeed, the highest talent requisite for the "*artist*" who undertakes landscape photography is that commonplace ability and purely mechanical skill which you may pick out from either the shop of the working mechanic or that of the pettiest tradesman. The futility of so poor a notion of an art like ours, capable of representing truthfully "the grand or beautiful objects and phenomena of natural scenery," will be apparent from the considerations advanced regarding the general principles of art in my first letter. As to those who conceive everything beyond simple mechanical directions for baths and processes to be out of place in a photographic journal, and denounce them with dogmatic intolerance as "cobweb weaving," let such dull souls, my dear fellow-student, "gang their gait;" but let you and I, and others who, like us, love and respect photography as a "fine art," strive with persevering earnestness to show the world how high a station this new branch of pictorial art is competent to fill.—In the hope of which strong is, yours truly, ALFRED H. WALL.

Exhibitions.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY OUR EYE-WITNESS AT MANCHESTER.

A Visit to Manchester differs essentially from a casual sojourn in any other place, and it has the great advantage of being practically useful and being nearly devoid of the mythical haze which often obscures theory. The photographers of that city, not willing that their abilities should be exhibited merely in the discussion of abstract questions relating to the art, have brought their results forcibly under our notice, in an Exhibition of which we may safely say (backed by the expression of Sir David Brewster on his visit) that it is, in many respects, the finest we have had the good fortune to see. There is, indeed, so much to admire and so little to detract from the *tout ensemble*, that we should prefer being permitted to make our remarks from some comprehensive stand-point, as it were, instead of manipulating in a more delicate manner the details which are in so systematic a manner arranged before us.

The British Association has acted wisely in appointing a Committee to undertake this department which, though personally nearly identical with that of the Photographic Society of Manchester, is nominally entirely different; for though some of the papers give the Society the praise attaching to this Exhibition, the Society is only indirectly entitled to it. The Committee, however, has performed its duties with great success; for, whether owing to the apathy of photographers, or the small amount of publicity given to the announcements, or the absence of personal solicitations, the eleventh hour arrived without the expected pictures, and they were only obtained by personal and immediate request. However, these difficulties were got over, and we may at once introduce our readers into the capacious room at the Exchange, where the pictures are exhibited.

One glaring omission we cannot pass over: there is no catalogue. An experienced scribe would have made one while the Exhibition was being arranged; and with the ample funds at its disposal we think the Committee ought not to have overlooked the great convenience of such an auxiliary in the inspection of the varied works. It is a matter of great difficulty to find out any particular picture, which would not have been the case if there had been a catalogue. The expenses, of course, are defrayed out of the guarantee fund, and we think greater praise would have been due to the Committee for providing so useful a document. No one will feel the loss of a complete catalogue more than the Committee themselves when this collection is dispersed, and no permament record remains of it, but such as the limited means at our command enable us to supply.

At first sight, the room appears cold and bare; but afterwards we are led to prefer it to the funereal draperies adopted in other places. The pictures, for the most part not in frames, are simply attached to the light-coloured plastered walls with drawing-pins; and the whole Exhibition is divided according to the process adopted for the negatives, of which we sought in vain for specimens. In an Exhibition professing to give a general idea of the art nothing should have been wanting. We also miss apparatus and a variety of other things, of which as yet the public remain in a state of ignorance. It would have been exceedingly instructive to have had an opportunity of inspecting a collection of chemicals, with the process of manufacture. Commencing on the right-hand side on entering, we begin with collodio-albumen; then its modifications,

viz., Petschler and Mann's process and the hot water process; Dr. Hill Norris's process, &c. We then come to the left-hand side of the room, and find specimens still of collodio-albumen, wet collodion, instantaneous pictures, coloured portraits life size and small album portraits, and some highly interesting pictures of persons in a state of mania and convalescence; also prints by the electric light, and then conclude the circuit of the room with specimens of the earliest style—old masters, in fact, in calotype—a valuable scrap-book of which lies on one of the tables, where are also some early daguerreotypes, lent by Mr. Sidebotham. On screens are also arranged examples of Turner's *Liber Studiorum*, some fine copies of engravings and maps, together with a picture of the solar spectrum, and a large collection of Mr. Dancer's microscopic photographs. Mr. Noton's pneumatic plate-holder and his albumen-beater are also in the room, together with Mr. Sutton's panoramic camera and lens.

We have preferred to make the circuit of the room in the reverse order, which is, indeed, the most natural, as most persons are attracted to the right on entering by Mr. Buxton's beautiful Egyptian views, which are doubly interesting as having been prepared in Manchester and exposed on the banks of the Nile. Manchester men ramble, and are to be found everywhere; and here is proof demonstrative of the fact—nay, the "very stones prate of their whereabouts." We are much inclined to prefer these views to those by Mr. Frith, although some painting out of skies has not escaped our detection. In one of these the sunbeams streaming through an open colonnade is given in a manner we never before saw equalled.

Mr. Sidebotham exhibits pictures of mark in nearly every department. His varied success is very remarkable, and shows how much may be done by careful manipulation.

Mr. Robinson is the only contributor of composition pictures, of which he sends three. The small ones, particularly that called *The Top of the Hill*, are more to our liking than the more ambitious one, *The Lady of Shalott*, which we think is sadly wanting in poetic grace. This is not the lady for whom the "knights came riding two and two."

Mr. Clarke, of Hayfield, is a worthy compeer of Mr. Mudd, but in artistic feeling is rather deficient. We do not like to see gables unnecessarily obtruding themselves on our attention; but his prints are fine specimens of toning (with phosphate of soda, we think).

Mr. Wardley, as usual, exhibits many specimens of high excellence, which we must allude to more fully in another notice.

Mr. Mudd claims special attention for the large number of his very beautiful specimens, and it would be almost invidious to select any of them as being superior to the rest.

The Petschler and Mann process must not be judged of by the specimens exhibited. They have the worst light in the room, and are not sufficiently bright in the printing to suit our taste. We have omitted to mention some stereoscopic pictures in their neighbourhood, some of which, by Mr. Underwood, are very good indeed; and those by Mr. Wilson are in that gentleman's usual style of excellence. Mr. Cottam deserves a word of praise for the industry he seems to have employed, which is apparent from the variety of subjects he shows in a large frame containing forty subjects, mostly by Mr. Parry's hot water process, of which process there are also some specimens by Mr. Young and transparencies by Mr. Parry.

The tannin process is represented by two pictures, of which we cannot say much in praise.

Mr. Mann exhibits three oxymel pictures, and in this, as well as in collodio-albumen, has nearly attained perfection.

There are also specimens of Rev. L. Sissons' preservative process.

Mr. Fenton's contributions are not quite worthy of that high reputation which he has obtained. There is also an example of a print obtained from a negative by Mr. Sutton's panoramic lens, about which we cannot say much at present.

Mr. Vernon Heath contributes four wet collodion pictures, which are excellent in their way.

The waxed-paper process is well represented by Messrs. Hooper and Sheard; but, though they succeed very well, the process will, we think, not compare with others better established. The range of subjects suitable for it is limited in extent.

Mr. Albin shows some wet collodion pictures, which are much admired. He employs Mr. Alfieri's camera campestra.

In portraits Mr. Brothers, of course, is conspicuous, particularly in his large group of the 84th Regiment, which we had the pleasure of noticing some time since. He also shows some pictures finished in oil of high merit as regards the working up, but somewhat short of that degree of artistic feeling which characterised some of the old miniature paintings.

Messrs. Smyth and Blanchard send some life-size portraits in oil, enlarged by the solar camera.

Some prints by Way's electric light ought not to be passed over, but we fear the experiment is too costly to come into general practice.

Mr. Hering's *cartes de visite* are remarkable for the ease and variety of *pose* which they exhibit; and Mr. Mayall's *Lord Derby* and *Lord Brougham* are deservedly favourites.

There is a large collection of early calotype portraits of great value, by Messrs. D. O. Hill and Adamson.

Mr. Hering's *facsimile* of engravings are of unusual beauty, and many would prefer to possess them rather than the originals if they could only be assured of their permanence, in which we as photographers have every faith.

Mr. Tracy sends enlarged pictures of microscopic objects, and near them are some rare photographic curiosities—printing without silver on nitrate of uranium, paper developed by ferro-cyanide of potassium, sulphate of manganese paper, &c., and printing in colours by various metallic salts, by Mr. Mercer.

Sir H. James's photozincography is illustrated by reductions of ordnance maps and the *facsimile*.

But the short time before "going to press" will not allow our doing more than scant justice to this highly interesting and instructive Exhibition, to which we must refer in another paper. Suffice it to say that we have derived great gratification in our visit to the metropolis of the cotton manufacture in every way. Σ

THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF PARIS,

CONSIDERED FROM AN ENGLISH POINT OF VIEW.*

(Communicated.)

RESUMING our notes on this important Exhibition at the point where we left off, we come to the name of Fargier. This gentleman exhibits some specimens produced by him with carbon by a process of his own invention, and others are also exhibited by M. Chavaret. The carbonic photographs which we have already referred to in our Journal are generally attributed to the inventive genius of M. Poitevin, and some excellent specimens, by his method, are exhibited by the inventor himself, and also by M. Lemercier, the eminent lithographer here. We know nothing of the claims of M. Fargier, whose specimens were presented to the Society here in October last; but this is certain, that the carbonic process forms the one great novelty of the day in photographic art, the absolute unalterability of the proofs being a quality of transcendant importance, while, so far as we have been able to judge, the tone and general effect is at least equal to that of any other photographic pictures. It has created some surprise that this process, or perhaps we should say these processes, have not yet been introduced into general use; but we believe that this has been caused by certain commercial engagements which seem now to have been completed, for we find that a well-known photographer of Paris is advertising the use of the carbonic system. We think that our friends and readers will do well to give their attention to this subject, which we simply recommend for their examination.

Messrs. Ferrier, Son, and Soulier contribute a large number of their stereoscopic slides, which for clearness and vigour it is but fair to say are at present unequalled, and the endless chain table stereoscopes which contain them are a constant source of attraction. The instantaneous views of the Boulevards, with crowds of men, horses, and vehicles in apparent motion, are certainly most remarkable productions—clear, crisp, and full of life.

M. Fierlants, of Brussels, has in the Exhibition a very interesting collection of reproductions of the works of ancient masters in the various museums of Belgium. All photographers know the difficulty of producing good copies of old pictures irregularly encrusted with the varnish and dirt of ages, and presenting frequently a surface which almost baffles all the skill of the photographer. Some of M. Fierlants' specimens exhibit a very successful struggle with such difficulties, and well deserve attention. *The Heads of Christ and of the Virgin*, by Quentin Matsys, and the Antwerp *Portrait of a Woman*, by Rembrandt, are amongst the most conspicuous. M. Fierlants has done good service, too, in giving the world photographic copies of several important works not generally accessible to the public, such as *The Portrait of a Woman*, by M. de Keyser, and *The Woman with the Glove*, by Van Dyck, in the gallery of the Vicomte B. Dubus, at Brussels; the *Portraits of Jean Charles de Cordes and of his Wife*, by Rubens, in the gallery of the Comtesse de Beaufort, in the same city; and a

* Continued from page 312.

Portrait of a Man, by the same master, in the Suermondt Gallery, at Aix-la-Chapelle. M. Fierlants exhibits also some very good photographs of the public buildings of Antwerp.

Major Webster Gordon exhibits some very interesting views in India, and types of Indian life; and Mr. Russell Gordon, of Chiswick, a series of remarkable photographs of the public buildings of Funchal, Madeira, with a fine view of the natural basaltic pyramid, called Homem-em-pé, on the road to Pico Ruivo, in the same island. This extraordinary natural monument is fifty feet in height, and stands on a hill 5,500 feet above the level of the sea. Some of Mr. Gordon's productions are stereoscopic.

M. Hammerschmitz, of Cairo, contributes some pleasing photographs of the interesting buildings of that city, and one or two others from the neighbourhood of Carnac and Thebes, together with stereoscopic views in various parts of Egypt.

M. Joguet, of Lyons, has, like many more of his countrymen, welcomed Mont Blanc into France, and has succeeded in catching some of the remarkable features of that ever-interesting spot. His view of the *Mer de Glace* is an exceedingly fine production, taking in a large area, and representing the features as well as the general effect very happily: the *Glaciers of the Wood* and the *Valley of Chamounix* are also very meritorious pictures. Amongst the curiosities of the Exhibition are the fans of Madame Laffon, with photographic views on silk and the enamels and vitrifications of M. Lafon de Camarsac: neither of these are very new or remarkably striking, but it is quite possible that each may contain the germ of an useful application of the art.

The litho-photography of M. Lemercier exhibits a considerable advance in the application of photographs to stone. The specimens exhibited are examples of three distinct processes: the carbon system of M. Poitevin already referred to, the bituminous process of MM. Bareswill and Davanne, and the bichromatic process of the former gentleman. Some of the specimens are printed in chrome, and have a very pleasing effect.

M. Letzter, of Cassorre, exhibits an interesting collection of groups of Hungarian and Bohemian officers, musicians, and peasants: the execution of the pictures is generally good, and the picturesqueness of the costumes secures them attention.

The archæologist will be attracted towards Dr. Lorent's (of Manheim) views of the *Sphinx and Pyramids*, the *Façade of the Temple at Elba Simbul, in Nubia;* of the *Isle of Elephants* at the commencement of the Cataracts of the Nile; of the *Temple of Jupiter;* and of the *Erecthion:* these are on albumenised paper from waxed-paper negatives, and the treatment is that which alone suits such subjects, clear and distinct.

Belonging to the same category are the views in the Crimea, Italy, Egypt, and Nubia, taken by order of the Emperor and of the Minister of State, by M. Léon Méhédin. The pictures of places remarkable in the history of the Russian and Italian campaigns will always possess a considerable amount of interest, and the dimensions of the pictures in question and the clearness of their execution greatly increase their value; but the views taken for the French Government in Egypt and Nubia, besides their eternal interest, are very superior as works of art, and show high artistic feeling as well as excellent manipulation. The great Pyramids, the noble ruins of Thebes, Ipsamboul, and Carnac, the Memnons and the Temple of Philoë, are admirably rendered, and the tone and colour of these large works are remarkably happy. The great monuments stand baking in the hot sun, reflected by the glaring sand; and the pink haze hangs as it were in the place of shadows. It is difficult to imagine a better rendering of the subjects, and the French Government and M. Méhédin have rendered a true service to art in thus placing in our hands, as it were, pictures of these marvellous works in a setting of their natural atmosphere. It may not be out of place here to give a hint to travelling photographers from another work by the same gentleman, to be seen in the same building, namely, a model of one of the obelisks of Luxor, in paper; M. Méhédin conceived the happy idea of taking what is at once both cast and model of this and other works by the simple process of pressing damp sheets of coarse paper on the sculptured *bassi-relievi*, and leaving them until perfectly dry, when they present all the *minutiæ* of the work in the most faithful manner. By this process he brought home in sheets a *facsimile* of the obelisk in question, which, being fixed on a frame of light scantling, presented so complete an appearance of stone as to deceive even the most practised eye. These same sheets were set up in Egypt out of doors, and remained so exposed for, we believe, two years, without the slightest apparent injury; and the inventor proposes to erect similar models in Europe, and says that experience has proved that they will resist the effects of the weather, even in damp climates, for a long period. Whether he be correct in this is a matter for trial; but so far is certain, that any travelling artist will find the process most valuable for bringing home exact copies of *bassi-relievi* and inscriptions. A moderate-sized box would hold a hundred of these papyroplastic models, which will bear almost any amount of rough usage, and, in comparison with any other material, weigh literally nothing, while a brush and sponge and water are the only other materials required; and in hot countries the drying of the paper cannot take long.

Of all the views from nature those of our countryman, Mr. Maxwell Lyte, are, according to our opinion, the most remarkable as photographic productions; most, if not all the pictures exhibited by this gentleman upon the present occasion are from the Pyrenees and the Valley of Pierrefitte. The works of that magnificent structure, the railway bridge of Solferino, now being hung in air over the precipice at Saint-Sauveur; the charming Vallies of Estaube, Gavarme, Luz and Baréges, Argèles, Ossan, and Eaux-Bonnes, the little watering place South of Pau, where the Empress was lately staying; the Pic du Midi of Ossan; the fishermen's port at Biarritz; the amphitheatres of Gavarme and Estaube, or M. A. Fould's beautiful chateau of Beaucens, exhibit almost equally the artistic eye and the able hand.

M. Tournachon, better known under the *soubriquet* of Nadar, exhibits a number of proofs taken by the electric light, and one negative which is said to have been produced, by the same means, in seventy-five seconds. These specimens are very unequal, but as experiments they deserve notice.

M. Charles Nègre's specimens of heliographic engraving, by a process of his own invention, seem to hold out some promise. A proof produced in ordinary copper-plate printing ink from a sun-engraved steel plate, representing sculptured details of the Cathedral of Chartres, although somewhat flat is still a remarkable production. The specimens of damascene work and ornamental engraving on steel by this gentleman's process are very remarkable. Of the same class are the specimens of heliographic engraving in marble, obtained by means of the bitumen of Judea, by M. Nièpce de Saint Victor.

Mr. Vernon Heath's views of the Duke of Bedford's mansion of Endsleigh, Devonshire, are amongst the most pleasing pictures and the best photographic productions in the Exhibition, and attract great attention, as English views always do in Paris when worthily rendered.

As usual the number of portraits in the Exhibition is very large, and there has certainly been a great improvement of late in that class of French photography. As to *cartes de visite* they have become a perfect nuisance, and not one in a dozen is even tolerable; but many of the larger portraits, it must be admitted, exhibit evidence of a more than ordinary amount of artistic education, or, perhaps, it would be fairer to say that, in consequence of the over-abundance of artists in France—good, bad, and indifferent—a larger number have taken to photography here than in other countries. Some of the collections in the present Exhibition are extremely interesting, from the reputation or notoriety of the originals; and of all the series those of the dramatic corps are decidedly the most effective,—Ravel's laughing face and wonderful play and command of feature making him especially conspicuous.

The number of visitors to the gallery shows that the taste for photography is rapidly extending in France; but it must not be forgotten also that plenty of space, sensible arrangements, excellent ventilation, and a low price for admission, have aided greatly in the success of the Photographic Exhibition in the Palais de l'Industrie; and it is to be hoped that our countrymen will take a few hints therefrom.

Meetings of Societies.

BRADFORD PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Wednesday evening, the 4th instant.,—Dr. Robert Parkinson in the chair.

The Chairman called attention to several matters respecting the circulation of photographic literature, as many inaccuracies had occurred, though he was aware that no alteration could be made until the yearly meeting.

The minutes of last meeting having been read and passed, Mr. Abbey was called upon to read a paper on the gum and borax process of the Rev. Lawson Sisson.

Mr. Abbey addressed the meeting to the effect that, having worked the gum and borax and the tannin processes, with a view of making a comparison, he had made several important discoveries which led him to go

back to the beginning of his researches, that he might thoroughly convince himself of the advantages the one process had over the other; and therefore he requested the Society to allow his paper to come before the next meeting. He, however, brought several large negatives, illustrative of the gum and borax process and also of the tannin; and, as far as could be judged, preference was given to the former.

Mr. Abbey also exhibited an excellent contrivance for washing plates after sensitising. It consisted of an India-rubber tube attached to a vessel full of water, and at the end of the India-rubber tube was a piece of pipe in the form of the letter T, and about an inch wider than the plate to be washed. This pipe was perforated with small holes, causing an easy flow of water all over the plate at one time. His mode of using it was to place his plate on a levelling stand slightly inclined, and run the water across in every direction, and, by merely pressing the tube between the thumb and finger, the supply was stopped: when out of use it was only necessary to place the tubing on the top of the receiver containing the water, supposing such to be a barrel.

The Chairman contributed a very fine paper photograph of the excellent print, *Eastward, Ho!* which was greatly admired. Mr. Abbey promised to be a contributor at the next meeting.

After some conversation on important matters connected with the Society, the meeting was adjourned.

Foreign Correspondence.

Paris, September 11th, 1861.

The Exhibition of the French Society of Photography, which was to close first on the 15th of July, and then on the 31st of August, will be extended to the 30th of September. The reason alleged for this new extension, decided on without consultation with the Society, which is at present taking a holiday, is the organisation of a lottery (which likewise has not been approved by any vote) destined to form a fund for prizes of encouragement to be given to investigators whose labours have contributed to the progress of the new art. You see how different our ways are from yours. Although we are in a country where universal suffrage is admitted and practised for political matters, yet general opinion is held very cheap in our societies, and those who have the direction of affairs do not scruple to act according to their own will. Among you, such a fact, if indeed it occurred at all, would raise a general outcry of protestation and blame. Here folks are dissatisfied, but say nothing.

The Exhibition, then, continues, and there will be a lottery. Only I cannot think that the system is a very good one. It has the inconvenience of in some sort obliging the photographers who exhibit, and who already pay a heavy sum as members of the Society, to supply prizes under the penalty of being charged with want of zeal in the encouragement of inventors. It likewise exposes the lottery to the risk of failure, for 10,000 tickets are not disposed of in a day. Supposing, too, that the hoped-for sum be obtained, and that the projected fund can be distributed, does not the Society assume a great responsibility in setting itself up as a judge in the very delicate question of inventions? All this merits consideration, and in expressing these considerations I am but the echo of what is said around me.

The Exhibition at Marseilles was opened on the 5th of September, when it was inaugurated by the visit ef the Bishop, the Mayor, the Military Commander, and all the notabilities of science and art. Despite the difficulties presented by the prolongation of the Paris Exhibition, the opening of the Exhibition at Brussels, and by the preparation for the coming one at London, it is very interesting, and includes numerous specimens. This result is due to the activity of the Secretary, M. Léon Vidal, an enthusiastic and disinterested amateur. He has also reserved for himself the labour of giving the public explanations of the processes employed, of the new methods, and the working of the apparatus—an excellent idea, by-the-bye, which ought to be adopted by other Societies in their Exhibitions.

A fact which has forced itself upon my attention merits notice here. It is the development that the practice of photography is taking in Spain. Till now we had seen but few specimens—and poor ones—from ultra-Pyrenean operators; and we knew but two or three professional photographers in that country. Now, the number is important. Not a week passes without our receiving several letters asking for information, and manifesting a strong desire to learn and to improve on the part of the writers. They are amateurs belonging to the clergy and the nobility, and "professionals" who are founding establishments. So we may reasonably hope that something noteworthy will shortly come from that quarter. Neither sunshine nor intelligence nor artistic sentiments are wanting to the Spaniards: the country where Murillo, Ribeira, Velasquez, and so many others have flourished, may well produce dhotographers of talent.

MM. Barreswil and Davanne have just brought out the third edition of their *Photographic Chemistry* It is a volume of 500 pages, containing thirteen new chapters. The theories which the authors therein develop are justified by a serious experience of the processes, and by a profound knowledge of the laws of chemistry. The labours of M. Barreswil are too well known for it to be necessary to dwell on his scientific merit. M. Davanne is not only a chemist: he is a photographer of the first order. The pictures which he exhibited in the Palace of Industry have been justly and unanimously ranked among the best. With such qualifications the authors, by combining their labour, could not do otherwise than produce an eminently useful book, and as such it is welcomed by the public.

The publication of a *Dictionary of Photography* is also spoken of. The book will certainly be successful, and will fill a place that was vacant in photographic literature. Published sooner it would have been too incomplete; but now that photography has attained such a development, such a book of reference is wanted. One may say, if the work were not written, it ought to be.

ERNEST LACAN.

Correspondence.

MALT PROCESS.

To the Editor.

Sir,—A letter appeared in your Journal of the 1st August, which my absence from town prevented me replying to on the 15th. It is from your correspondent, "Peter Smith."

I could have wished that one who puts himself forward prominently as a censor of the conduct of a large body of scientific and respectable men, should have shown in his correspondence some knowledge of photographic chemistry, or, at all events, that he should not have discarded chemistry as a means of explaining some of our curious and unexpected photographic processes. "Wort," says he, "is commonly called sweet wort before the hops have been added, after which addition some call it hopped wort and some bitter wort." Now I opine that, however common such expressions are amongst the workmen of a brewery, they are totally unsuited for scientific discourse. I have nothing to do with the common expression, but with the chemical composition of this substance and the infusion of malt, which was Mr. M'Nair's proposal. That sweet brewer's wort was proposed in 1855 as a means of protecting washed collodion plates is not denied; but is this the same as Mr. M'Nair's process of 1860? Sweet wort is made by extracting as much sugar as possible (along with other ingredients) out of the malt: Mr. M'Nair's infusion is made by extracting as little sugar as possible out of the malt, and as much as possible of the other principles. The two processes are essentially different, therefore, and their results are as much so. The sweet wort process is a complete failure in the hands of one who has tried it, while the malt process of Mr. M'Nair yields more stereoscopic negatives and stereoscopic transparencies for the market than any other process at present used. One professional photographer alone, in Edinburgh, sends hundreds of gross annually into the market, and all of them prepared by this process.

As regards the gum arabic process, your correspondent admits now that I did not give it forth as a new process, but only new in some particulars. Those he does not seem to know. I will tell him, however, what they are:—the very strong aceto-nitrate sensitising bath, and the stated washings with given quantities of water. I will be glad to confess my error when your correspondent points out to me where such modifications have been published before.

So much for the subject of your correspondent's letter; but your correspondent himself must permit me to express my doubts as to the correctness of his name and address. *I* am certainly unacquainted with any one of that name whose photographic works entitle him to become a "dictator to Scottish photographers;" and, although I have replied to an attack made from an unseen quarter on the Photographic Society of Scotland generally, and myself personally, I will not consider it a duty to reply to further observations from any one who is ashamed to attach his own name and address to them. I am, yours, &c.,

August 27th, 1861. ROBERT PATERSON, M.D.

COINCIDENCE OF FOCI.

To the Editor.

Sir,—Will you have the kindness to inform me through your valuable Journal about what distance I should place the camera from the number of cards you describe, to test a lens for the chemical and visual foci.

I have been trying about three feet from the centre card, but think I am putting it to too severe a test. The lens is a No. 3 A. Ross.

I am, yours, &c., J. H. S.

[The distance should be about the same as you would place a sitter—say from ten to fifteen feet away. If placed so near as you describe, some qualities of the lens may be apparently worse than they are in reality, though this does not necessarily involve any disagreement between the visual and chemical foci.—Ed.]

Birmingham, September 4, 1861.

GLASS FOR OPERATING ROOMS.

To the EDITOR.

SIR,—Would you be so good as to say, in the next number of your Journal, whether or not you have heard of any complaints against the white Belgium glass being used in glazing photographic studios, as I have just enlarged my studio, and used it extensively, but have not so good an actinic light as I expected? By attending to the above, you will greatly oblige A. C.

P. S.—Could you say what is the best kind of glass to use for the above-mentioned purpose?

Stirling.

[We have not heard of any complaint against the glass named; but your disappointment may possibly arise from the rapidly deteriorating actinic power of the light at the present season, especially as we travel northward.

We believe that the colourless sheet glass is regarded as the best for the purpose; but if you will apply to Mr. Forrest, of Lime Street, Liverpool—who is commercially interested in glass, and also an able and enthusiastic photographer, always willing to impart information to his *confrères*—you will obtain the best of its kind.—ED.]

DIFFICULTIES IN THE TANNIN PROCESS.

To the EDITOR.

SIR,—Allow me, through the medium of your columns, to thank "T. M. W." for the information which he volunteers as to the manner he prepares his plates for the tannin process, namely, by drying or warming before coating with collodion—a plan which I have myself tried, and found answer well with the small stereo. plates; but if ever your correspondent tries larger ones, such as I was working with—eleven inches by nine—at the time I applied to you for the information which you so kindly provided, I am much mistaken if he find simply warming will prevent the film blistering, on wetting it before developing.

I have great pleasure in informing you that the dilute albumen solution you recommended, poured on the plate and dried, fixes the film most effectually. But I have still one complaint to make: it is the presence of small bubbles on the albumen film, caused, I think, by using the sponge to make the solution flow evenly over the plate, and which appear in small black spots after sensitising.

Would not the addition of say from one to two ounces of pure spirits of wine to every ten ounces of solution make it flow evenly over the plate, like collodion, and so dispense with the sponge or glass rod? Any information on this subject will be thankfully received.

I am, yours, &c, VERDANT GREEN.

DRY PLATE DIFFICULTIES.

To the EDITOR.

SIR,—I have been amusing myself lately with trying my hand at the dry processes, viz., honey, albumen, and tannin. In albumen I have been completely baffled by those well-known water markings, which seem to be the common fate of all beginners: still I think these may be overcome with care. At the same time I prepared two plates by the tannin process, fifteen grains to the ounce, but very foolishly omitted to mark them. When I came to develop the pictures, there were only two clean pictures out of a dozen; from which I naturally infer they were by the tannin process. I may here say that I hardened or baked the whole dozen for a few minutes in a tolerably warm oven.

A week afterwards, on the Friday afternoon, I prepared two more plates by the tannin process, and dried them on a tin of hot water: they were exposed in an hour or two afterwards, and developed as soon as I got home. One picture quitted the glass, the other gave me a fair negative. That night and the next morning I prepared fifteen plates by the same process, finishing by drying on a tin of hot water. I started in the afternoon to expose them in the neighbourhood of Vale Royal, Lord Delamere's seat, and brought home what I considered should give me at least nine pictures. One of the plates I developed the same evening, which, with the exception of a little want of intensity, gave a clear picture. I put the others on one side till Monday morning, thinking I should have more time to develop them carefully.

Being new in dry process photography, you will naturally imagine I was up betimes on Monday morning, to grasp at the shadows I had secured on the Saturday. Great was my consternation at beholding what might have been tolerable pictures completely covered with the most fantastical markings conceivable, and I could not secure a picture out of the whole batch.

What was the cause? Were the plates not sufficiently hardened, or will they not keep after exposure as well as before? This process seems to be much simpler in the manipulation than any other, if we can only depend on the keeping properties for even a short time. Do you recommend the fifteen grains tannin to the ounce of water or the thirty grains? I enclose two of my spoiled prints to show you the difference of success between my Fothergill and tannin manipulations. I used a quarter Lerebour portrait lens, with a three-eighths inch stop between the lenses.

I trust I shall not be too late to have a line in the last column of your next issue.

THE BRITISH JOURNAL OF PHOTOGRAPHY being my only instructor will be an ample apology for troubling you.—I am, yours &c,

August 12th, 1861. WATKIN.

[Your letter arrived while we were absent from town, and from some inexplicable cause it has only just reached our hands. We have little doubt that the cause of your failure is in not having sufficiently freed the plates of nitrate of silver by washing. By all means procure a copy of Major Russell's book, recently published.—ED.]

ANSWERS TO CORRESPONDENTS.

☞ Owing to the great length of the proceedings of the British Association, the papers of several valued contributors are postponed till our next number. Among other articles left over is a notice of Mr. C. Jabez Hughes's excellent little work *The Principles and Practice of Photography*, &c. Second Edition, with important additions.

E. LARLEY.—Declined with thanks.

W. H.—See the notice of Meeting in another column.

FATIGUED ONE.—Mica in large sheets is very expensive.

DOUBTFUL.—Both are good: we believe you may depend upon either.

T. R. F.—See notice of meeting of the North London Association.

O. P.—Apply to the publisher: we have nothing to do with the business of the Journal.

A. G.—It is a matter of taste: personally we prefer the warm purple to the cold blue tones.

C. A. P.—At page 197 of the current volume, No. 143, you will find a reply to your query.

NEMO ME IMPUNE LACESSIT.—"A word to the wise," &c. We named no names, but the cap fitted.

COSI FAN TUTTI.—Not all, but many certainly: that one in Oxford Street we believe to be an exception.

NO ADEPT.—We cannot recommend the method indicated: it is at the best but a clumsy make-shift.

FAIRFAX.—Too late for reply in our last. All on your list are good; you cannot do better then take the first.

W. JONES.—It is necessary to apply for space to F. R. Sandford, Esq., Secretary to the Royal Commissioners, 454, West Strand, London.

I. H. S.—Your lens is very fairly placed as it is; but, if you make any alteration, place it more nearly opposite to the upper part of *the chest*.

LITTLE ONE.—We have not seen M. Bertsch's instrument: the nearest approach thereto that we are acquainted with is Mr. Skaife's pistol-camera.

JUVENIS.—A tripod head we regard as indispensable; for, if you attach the legs directly to the bottom of the camera, you cannot revolve it in azimuth.

GEO. D.—The name of the author is appended to the article, and he only is responsible for the opinions expressed, and which we have on several occasions disavowed.

PLATE-BOX.—Mr. Keene, of Leamington, supplies a very capital form in metal; Messrs. Murray and Heath one in wood—both with gutta-percha grooves. We presume it is one of these that you mean.

QUERIST.—It is a subject that we have watched with much interest, but we have made no experiments with the spectroscope. Apply to the editor of the *Chemical News*, who is the best authority on the point.

W. S.—Surely you do not read this Journal, otherwise you would know that in order to obtain a reply to your query your letter must come to London; and, secondly, that so lately as the 1st July last an article *On Filtering Collodion* appeared at page 236.

D. D.—We do not like folding cameras for our own use; and if we used any one, we should certainly not adopt the form contrived by Captain Fowkes. The best we ever saw was one with folding wooden sides, such as Mr. Ottewill used to make in days gone by.

BABE AND SUCKLING.—We fancy there must be "two Richmonds in the field." Surely this is not our former correspondent who adopted this signature. The kaolin is used to decolorise the paper sensitising-bath that has become brown by use; but we prefer Mr. Barker's remedy for this purpose, viz., oxide of silver.

WALTER.—Many years ago the idea was acted upon by Dr. Diamond, who took many valuable negatives of insane patients, illustrative of the various phases of that dread disorder. No doubt photography would also be invaluable in illustrating a work on curvature of the spine; it is far above lithography for that purpose.

M. F. G.—We perceive that your letter is intended in kindness and therefore take no offence at your remarks: it is, however, manifest that we do not regard the subject from the same point of view. The articles are the *bona-fide* communications of well-known correspondents, who have been grossly insulted, and are published as received, some few omissions only excepted. We may remark that we have received *one* other note in the same strain as your own, and yet another in a diametrically opposite one.

AROHAM O.—We have frequently found that printers err in supposing that, because their sensiting-bath was originally of a certain strength, it must remain the same after use. If your paper be strongly impregnated with a chloride, it will abstract a large share of the nitrate of silver; so that, although you may have produced good proofs with the *same* bath, paper, and other chemicals, with which you produced the specimen received by us, there is nothing mysterious in your present failure. Deficiency of silver is at the bottom of your annoyance. See reply to Sincos.

SINCOS. (Oxford).—Silver bath *too weak*: the term "a good strength" is very indefinite. Use one hundred grains to the ounce of water: it is economical in the end. To tone—use one grain chloride of gold to five grains carbonate of soda, mixed in about ten ounces of warm water. Wash away the free nitrate of silver thoughly before putting the proof into the toning-bath, and be especially careful not to examine the proofs while in the printing-frame in too strong a light. This practice is especially objectionable when the alkaline gold toning-bath is used. Your paper has no doubt a large dose of chloride: hence the necessity for a strong silver bath.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 151, Vol. VIII.—OCTOBER 1, 1861.

Classification of Photography.—The last number of the *Journal of the Photographic Society* contains a long communication from M. Silvy—lately designated by M. Claudet as "*a single unhappy exception*"—ostensibly in reply to the last-named gentleman, but evidently intended as a general manifesto embodying the author's sentiments upon the alleged want of connexion between photography and the Fine Arts, and almost, if not quite, dictating to photographers that they shall, like him, consider their art as essentially mechanical. The first observation that occurred to us after perusing M. Silvy's somewhat lengthy document was, that if we had to draw a distinction between M. Claudet and M. Silvy, we should describe the former as "a photographer full of art," and the latter as "an artful photographer"—the difference being of course a mere bagatelle. It is scarcely worth while to reproduce *in extenso* an article containing so few arguments, diluted with so many assertions without proof, but we propose making a few extracts for the sake of adding a comment or two thereon.

There is one very noticeable omission in M. Silvy's article. Although he alludes to various branches of the Fine Arts (as acknowledged to be such by himself), and some others which he excludes, he makes no mention whatever of engraving, either in one category or the other. This is quite in accordance with our estimate of him as "an artful photographer;" for we fancy he would have been puzzled to show that photography does not demand in its successful pursuit quite as much genius as the art of engraving—consequently, as M. Silvy approves the classification of the Royal Commissioners for the one, he must, if consistent, condemn it for the other. That there may be some difficulty in deciding exactly where *art* begins and *mechanical manipulation* ends, we are ready to admit; but certainly we should not, as M. Silvy appears to have done, locate the former rather in its mode of expression than in the individual who gives rise to the conception. If sometimes by means of photography I contrive to convey to other persons a correct expression of my ideas of the beautiful, and at others I do so by aid of the pencil, am I to be considered in the one case as a mere mechanic and in the other as an artist? If it be contended that the most spirited sketch made with a red-hot poker upon a panel (however artistic in itself) is not entitled to be regarded as a work of art—a question that it is needless to argue for the moment—the ground of exclusion would be a want of appropriateness and proper dignity in the method of recording the ideas, or otherwise an incongruity in the vehicle of expression. This could hardly apply to photography; as the materials employed both in photography and drawing are closely allied to one another, if they be not even identical—that is to say, in the one case paper marked or stained with silver or carbon, in the other paper marked with carbon in a certain form. Why, then, if I render the same idea successfully with my camera that I have previously done with my pencil, am I to be designated a mechanic for the first and an artist for the second work?

M. Silvy declares that photography cannot be a Fine Art, because *genius* is not indispensable to its pursuits—"the genius which invents, creates, composes, and which imprints on its works the immortal seal of the Fine Arts." Is not this what our American friends would call "a bit of Bunkum?" How many paintings, drawings, statues, poems, &c., &c., come within the limits above defined? And yet, though but one out of ten thousand fulfil these conditions, the arts which they represent are called "Fine" in spite of the 9999 which have nought fine about them. Again, what is to be understood by invention and creation, in an artistic sense? We make no inquiry about the third requisite—composition—for we presume that quality can scarcely be questioned in connexion with photography. We wonder if M. Silvy ever saw Mr. Rejlander's *Head of John the Baptist in a Charger?* Would the production of such a picture by the brush or pencil involve invention or creation—or both? And if so, why not with the camera? We are not sure about the difference supposed to exist between art-invention and art-creation. Does the former merely include the mental conception, and the latter the mechanical production, of something never before conceived of?

It is not enough to show that the artist cannot perform by means of photography *all* that he can by aid of the pencil, because he cannot produce by the latter all that he can by the assistance of the mallet and chisel, while by each mode of operating he can accomplish something that he cannot perform by either of the other two.

The following extract from M. Silvy's communication is too rich to be omitted:—

"From the list you raise in opposition, begin, I pray you, by effacing every French name. The first that you cite, Count Olympe Aguado, was my photographic master. It is to him that I owe the first principles of that art which he practises with so much honour, and which he so nobly patronises. His counsels have ever been as precious to me as his friendship has been dear. I know his mind, as every one knows his talent, and I assure you, sir, that he is too great an artist by nature to pretend to a place which he would have more right than any one to occupy, if it could be assigned to photography.

"Gustave Legray, the learned artist and chemist, who has given us the collodion and the best instruction books of his methods; the brothers Bisson, who have produced the finest pages of our monumental reproductions, and who, courageously pursuing their work, astonish the world by their touristic daring (I think the summit of Mont Blanc is one of the highest positions photography can attain); all of them, sir, are artists of too much modesty as well as talent, that, in their name and *without consulting them*, I fear not to assert that they have not the presumption you attribute to them."

That word "presumption," employed in such a paragraph, appears to us as trenching upon somewhat dangerous ground: it is clear that "presumption" exists somewhere.

Photographs in their nature are, our author asserts, "essentially mechanical."

Productions that are "essentially mechanical" have usually the quality of being each one a *facsimile* of its predecessor in manufacture. If photographs be mere manufactures, how then does it happen that they do not possess this distinction? Every photographer knows the difficulty (not to say the impossibility)

of making each succeeding proof from the same negative an exact counterpart of the preceding one; while as regards consecutive negatives few would even expect to make them so.

Again, we quote M. Silvy:—"The Royal Commission has classed photography amongst the mechanical arts. I find this classification correct, and I say so." Dr. Lyon Playfair, who arranged all the rest of the classification, finds this classification *in*correct, and *he says so*. Which of these two opinions is worth most?

The secret of M. Silvy's advocacy will perhaps appear from the following, viz.:—

"Although of recent discovery, photography has rapidly placed itself on a level with the highest mechanical and industrial arts. Restricted within the circle of its useful applications, it is summoned to give magnificent results. Instead of rivalling the Fine Arts, let it attach itself to serving them by furnishing them with all the documents which they have as yet acquired only by long study, and then it will have a place beside them, and the Fine Arts will admit it as an auxiliary instead of repelling it as an intruder. The province of Art is to elevate the human mind in imbuing it with the taste for the beautiful. Art creates, composes, idealises, and is occupied less in reproducing than in interpreting nature in that language, almost divine, which makes a great artist a demigod.

"As a means of propagation, photography ought to bring to the Fine Arts the same aid that printing has given to science and letters. The Fine Arts speak to the mind by representation, as philosophy by letters, science by lines and figures.

"Let photography apply itself to useful and cheap productions. Let it extend its works to an unlimited number of copies, and at a price suitable to every class of society, and it will have fulfilled its mission, which is to popularise representations."

A "demigod" ought to know that "science" speaks to the mind in other ways than merely by "lines and figures;" but we suppose it is not a "demigod's" business to know anything of "science."

In stating that Sir Frederick Pollock, as President of the Photographic Society, "has fulfilled the duties which his position imposes on him," he has simply asserted what all who are acquainted with that highly-respected gentleman knew would of course be the case; but when he insinuates (which he does) that the worthy President is the mere exponent of, without sharing in, the views of the members of the Photographic Society, he assumes that which is distinctly contrary to the fact.

Before concluding, we must not omit to mention in M. Silvy's favour, however much we differ from him in our views, that his communication throughout bears the stamp of good temper, although M. Claudet did lean somewhat hardly upon him in a rather personal sarcasm. We admit the retort was tempting; but M. Claudet could well have afforded to have foregone the indulgence.

We have, as a result of consideration, arrived at the conclusion, from circumstantial evidence only, that M. Silvy was a graphic artist before he became a photographic one, and that now he is jealous of, and cannot forgive, the art which he has been *forced* to adopt, although he prospers by its practice. It is ungrateful to speak an ill word against the boat which carries one safely over.

International Exhibition.—We are just in receipt of the current number of the organ of the French Photographic Society, and perceive that our photographic brethren across the channel are under a misapprehension relative to the proceedings of the Council of the Photographic Society as a body. The position assumed by the Council is one not of direct antagonism to the Royal Commissioners, but simply *protestant*. The Council very naturally objects to undertake the *responsibility* of managing the photographic part of the forthcoming Exhibition without being permitted any freedom of action in the matter. It will not attempt to prevent any number of photographers from exhibiting, as, indeed, it could not, and no doubt plenty of English photographs will be found in the collection; but, as the recognised exponent of the great body of British photographers, the Council of the Photographic Society could not with propriety have accepted the very undignified position assigned to it and to the art which it represents.

EXPERIMENTS WITH ALBUMEN ON GLASS.

By Dr. R. L. Maddox.

[Read at a Meeting of the North London Photographic Association, Sept. 18, 1861.]

Early in June I commenced some experiments in printing transparent positives on albumen prepared glass, chiefly with a view to obtain, if possible, a fine neutral tone or colour when examined by transmitted light.

To say that very many failures marked the course would be merely to relate what commonly follows the steps of the experimenter, where guides are few and paths numerous.

Firstly,—I endeavoured to procure a dense, yet perfectly liquid, albumen liquor, that would rapidly filter through Swedish filtering paper, and bear a certain amount of heat without cracking on the glass, and, at the same time offer, when iodised, a character of its own under development.

Diluted phosphoric acid (strength *London Pharmacopœia)*, added in small quantity to albumen, I found to liquify it so much that it would easily pass through filtering paper: one point was therefore gained. The next step was to iodise, sensitise, expose, and ascertain the colour of the picture after developing and fixing.

The formula eventually stood thus:—

Albumen, fresh	6 drachms.
Dil. Phos. acid *(Lond. Ph.)*	½ „
well mixed—then	
Iodide of ammonium	9 grains,
Iodine	½ „
Water	1½ drachms,

were added, the whole well frothed, allowed to stand a few hours, and filtered thrice through paper.

Proportions in the bath were—

Cryst. nit. silver	1 drachm.
Distilled water	1 ounce.
Glacial acetic acid	40 minims.

The developers, after trying various formulæ, were—

Pyrogallic acid	1½ grains.
Citric acid	¾ „
Water	1 ounce.

To which, at the time of pouring on the plate, after it had been well moistened in fresh filtered rain water, a few drops of formic acid and solution of nitrate of silver were added; or, twenty-five grains of gallic acid in three ounces of hot water, with the addition of a few drops of Beaufoy's acetic acid and solution of nitrate of silver used instead.

The albumen plates were dried with and without artificial heat. On an average, with two minutes' exposure in the camera to a moderately sunlighted view, using Derogy's stereoscopic *portrait et paysage* combination, with smaller stop, when developed with either of the above, gave dense pictures, having a thin surface after fixing and drying, of a peculiar iridescent purple, blue, and red appearance of the film by reflected light. In the blacks and half-tones, if not over-developed, there was a marked, soft neutral tint, a little inclining to violet-purple by transmitted light.

Under a collodion or albumen negative, exposed for ten or fourteen seconds to a bright north light, when developed by the pyrogallic solution, the tint inclined to violet red, and when with the gallic acid developer to a maroon or warm purple-brown.

Between the negatives and positives produced by these methods there was always a marked difference in the colour by transmitted light, which no variation that I tried as to time of exposure or mode of development by increasing and decreasing the various chemicals in the developing liquids appeared to regulate, so that they should, when printed, correspond in tone.

I likewise used, for trial, albumen with caustic potash, one grain to the ounce, with iodide of sodium, a minute quantity of iodine, and half a drachm of water: also, albumen, with one drachm of filtered fresh ox-gall to the ounce; iodide of ammonium and bromide of potassium, without the addition of water. I mixed these in various proportions. I was surprised to find, with the same developers, how much the colour of the transparent positives varied. Some were of a smoke-tint (caustic potash), some of a burnt sienna tint (ox-gall), the mixed partook of the two; but neither were so pleasing, at least to me, as those produced with diluted phosphoric acid as a solvent for the albumen.

You may suppose my bath soon gave signs of discolouration, in order to meet which, after trying kaolin, I adopted the plan of boiling with carefully-prepared animal charcoal: this gave a bright clear liquid. An addition of acetic acid was made to meet the loss by heat. The albumen and phosphoric acid plates, when sensitised in this and developed by the same pyro. developer as before, gave

strong negatives and positives, each with an almost metallic surface by reflected light, yet transparent by transmitted light, the positives being of a brown, raw sienna tone, inclining to red, but very bright.

The addition to the bath of fresh nitrate of silver gave a dense milky-yellow turbidity (*vide* Legray's *Traité de Photographie*, article *Noir Animal*—some excellent remarks). The plates prepared in the same manner were also, after sensitising, treated with washing by water, and then flooded with albumen and ammonia liquor, *à la* Fothergill; also the same with the addition of salt.

Iodide of iron, gallic acid, and various substances were tried as accelerators. Those with the albumen and salt were slightly more sensitive.

As colour was the primary object of these experiments, I did not take particular trouble to procure perfect pictures or prints. Many of the negatives were filled with "pin-holes," some with minute black points or spots; but these I attribute to the condition of the liquids, want of further filtering, &c.—all amenable to attention and patience.

As regards the keeping quality of the liquids, the albumen and phosphoric acid, after a few days, became turbid, with a whitish deposit on the bottom of the vessel; and, after a week or more, sometimes with mildew on the surface. The ox-gall liquid changed to greenish in colour, and became slightly turbid. The caustic potash liquid remained clear, and became very thin, depositing a little sediment.

The plates were not kept over a few days. The liquid, with caustic potash, gave a fine grained surface: it quickly discoloured my bath. The albumen and ox-gall plates had a considerable tendency to result in the appearance of over-development, if anywise over-exposed. None were sufficiently sensitive to please me.

Having established to my own satisfaction the use of diluted phosphoric, instead of acetic or citric acid, I soon put it in use in the collodion wet and dry processes. At first I used the ordinary fifteen-grain protosulphate of iron developer, with acetic acid, to bring out the details; washed; fixed with cyanide of potassium; then poured over the plate, for thirty seconds, a few drops of a weak nitrate of silver solution, with a few drops of diluted phosphoric acid in water; and eventually pouring it off into aceto or citro-pyrogallic developing solution, to bring up the intensity. This answered excellently for portraits with collodion, iodised by iodide of sodium, iodide and bromide of cadmium. For the same collodion—wet—a solution of pyrogallic acid two grains, diluted phosphoric acid fifteen minims, and filtered fresh rain water one ounce, flashed out the picture like an iron solution, quickly acquiring density, and—allowing this to be carried to a nice point—the shadows beautifully clean and clear, the half-tones good, but the sky in views *scarcely* so dense as may be desired without the risk of injuring the shadows. The colour by transmitted light was neutral, inclining to a deep lilac bloom; but, when used after an iron developer, the sky *is very dense, the graduation in the half-tones remarkably fine*, and the colour neutral, inclining to black, by transmitted light.

Instead of using acetic acid with the protosulphate of iron, diluted phosphoric acid was employed. After remaining on an exposed collodion plate for five minutes, not a sign of a picture could be seen: the plate was well washed, a solution of nitrate of silver and diluted phosphoric acid was poured over the plate several times, then drained, and the ordinary iron developing liquid tried for one minute—still no picture. I began to question some error in lifting the shutter or uncovering the lens, &c., so rewashed the plate, used fresh dilute silver and phosphoric acid to recover the plate for thirty seconds, then poured these into the ordinary pyro-acetic acid developer, and flooded the plate. After a short time the picture made its appearance, but showing strong signs of irregular development and general darkening from, I expect, imperfect washing. The development was therefore discontinued. A similar experiment was made another day, using longer exposure: a like result attended the effort to develop the negative. Hence it shows a very marked difference to acetic acid with iron, and less with pyrogallic acid.

In the albumen prepared plates, those covered with a dense albumen gave, on using tepid solution of gallic acid for development, a swelled film, that seemed to attract and hold the particles of reduced silver in a very rough and uneven manner, even when they had been dried by heat, and which did not disappear perfectly when dry. With the collodion plates the grain of the deposit is remarkably fine when using diluted phosphoric acid either with iron, and intensifying, or with the phosphoric pyrogallic solution alone.

I have not found it to answer well in the dry Fothergill prepared plates. The reduced silver seems to partake of a too crystalline nature: though, when dry, this passes off to a great extent, yet there is a visible reduction on the shadows.

Some, whose attention may be drawn to these remarks, may perhaps be ready to say:—Why, what if diluted phosphoric acid be a retarding agent—it has been employed long since by so and so, or proposed by Mr. ——. Such may be the case, though I am not aware of it; therefore, should you, gentlemen, know that it has been previously employed by others, please save me from the undesired position of placing myself in a false light, and adopt only so much of these remarks as may bear about them any novelty or usefulness.

The experiments, I am sorry to say, are sadly incomplete; indeed I have hesitated considerably before offering them. They were made under the cloud of much suffering from ill health, which, I trust, may tend to shade their defects and my deficiency.

STRAY CHAPTERS FOR PHOTOGRAPHERS.

By James Martin.

ON VARNISHES.*

Having described, in the previous "chapter" on this subject, what is a varnish, and of what varnishes are made, we have now, in pursuance of the plan laid down, to consider the question—

How are varnishes made?

It would avail but little to the readers of this Journal to enter minutely into the details of the manufacture of varnishes on the large scale. It is proposed, therefore, simply to furnish a few formulæ, with practical instructions for the preparation of a small quantity for the amateur's own use. The precautions necessary to be adopted in the use of the varnishes will be named, accompanied by a statement of the defects and failures which sometimes occur, with their appropriate remedies.

There are five kinds of varnish in general use among photographers—namely, simple albumen varnish, varnish of dammar dissolved in benzole, amber dissolved in chloroform or benzole, and lac varnish, in which either the bleached or ordinary shellac is dissolved in alcohol or methylated spirit.

Simple Albumen Varnish.—The whites of eggs are beaten completely into froth, and set aside: the clear mobile liquid which separates is the varnish in question. It is applied to the negative in the same manner as collodion, and the excess being drained off heat is applied until a slight vapour begins to arise, which may be regarded as an indication that the albumen is coagulated and the varnishing completed; the heat should therefore be withdrawn.

In the preparation of this varnish it is important to avoid diluting it with water as, if this take place at the end of a few days it splits and scales off, taking with it the collodion film.

On account of the semi-opacity possessed by this varnish it is a good one for feeble negatives, protecting the middle tints. As albumen cannot strictly be called a resin, we must ask pardon for describing here a preparation which, it must be admitted, does not come within the definition of a varnish given in the first paper; but, as it is used by our neighbours in France, it was thought better not to omit it.

Dammar, or *Soft Copal Varnish*.—This preparation is very generally known under the name of crystal varnish: it is made by adding ten per cent. of finely-powdered dammar resin to *good* commercial benzole. The mixture should be actively shaken from time to time during the first day, and then set aside for eight days, to allow of the subsidence of a minute portion of *gum*. When the supernatant liquid is quite clear, it should be drawn off by means of a glass syphon, and is then ready for use. If filtration be resorted to for the purpose of clearing this varnish, the operation will be found a very tedious one, as the benzole seems to have the power of opening the pores of the thickest filtering paper in such a way as to allow the fine particles of gum to pass through. This varnish, on account of its perfect freedom from colour, would make an excellent negative varnish were it not for its unfortunate property of softening and becoming tacky when exposed to the direct rays of the sun: its use is consequently restricted to the protection of the collodion film in a direct positive on glass, for which purpose it answers better than any other. The precautions necessary to be observed in its use are the complete dessication of the plate by means of a spirit lamp, and allowing it to become quite cold, after which the varnish is poured on in the same manner as collodion, and the picture allowed to dry spontaneously. When this varnish

* Continued from page 306.

is used for negatives it is found to penetrate the substance of the film very completely, thus communicating great transparency in every part. It is, however, very important that the negative should not be exposed to the direct heat of the sun, as many good ones have been spoiled by this means, through the adhesion of the paper to the softened resin.

AMBER VARNISH. — The use of this varnish was originally suggested and applied to photographic purposes by Dr. Diamond. It is perhaps the most convenient varnish in use for negatives; for it is extremely volatile, dries instantaneously, is unaltered by heat or light, while it serves equally well for weak or vigorous negatives, its high price being the only drawback to its use. It is prepared by macerating for eight days 30 parts of finely-powdered amber with 500 parts of anhydrous chloroform, the proportions not being very important, so that the amber be in excess and the chloroform thoroughly saturated. The mixture is shaken from time to time, and lastly filtered through fine bibulous paper, as required for use. In using it, it should be poured rapidly over the surface of the negative, and the excess as rapidly drained back into the bottle; for as soon as it has evaporated it is completely dry, the film deposited having scarcely any appreciable weight in the case of the smaller sizes of plates, and, possessing very little brilliancy, any ordinary heat, such as a negative is likely to be exposed to in a pressure-frame, does not alter amber varnish, except, perhaps, by making it adhere still more closely to the negative, so that it is possible to expose a negative to the direct rays of the sun for days together without producing the least softening or tendency to crack.

Amber forms with benzole a varnish slightly brown; but the film deposited on the negative is, from its extreme tenuity, almost colourless. The solubility of this resin in benzole, and also in chloroform, is greatly increased by being heated to about 570° Fah. in a well-covered vessel until it softens and swells. Before this swelling takes place, however, white fumes will be disengaged, which need not be noticed, as the operation is not complete until a considerable increase in bulk has taken place. Amber thus transformed produces, when dissolved in benzole, a varnish superior to that yielded when the same resin is dissolved in chloroform.

Its superiority consists in its freedom from a tendency to crack and split the film of the negatives upon which it is poured. This unfortunate property possessed by chloroform and amber varnish seems to arise from the rapid evaporation of the chloroform, causing a sudden change of temperature from warm to cold; an unequal contraction takes place, and, in consequence, the splitting of the film.

The foregoing are the principal varnishes generally known which are applied *cold*. The one described as being made with fused amber and benzole is not much known, simply because it has not been introduced to photographers; it is, however, recommended with great confidence by M. Monkhoven.

The varnishes which require the negative to be *heated* previous to their application now present themselves for consideration.

Foremost among these is LAC VARNISH, at first made by him (Monkhoven) with only white stick lac and alcohol; but, having been observed to split and scale off with sudden changes of temperature, it was subsequently modified as follows:—

Alcohol, sp. gr. ·815	40 ounces.
White stick lac	3 „
Picked sandarac	3 drachms.

The addition of the sandarac seems to render the film more elastic. The solution of these resins in the alcohol is effected by placing the whole in a flask and applying the heat of a water bath: in a few minutes they will be found to have dissolved, except a few light insoluble filaments, which may be separated by passing the whole through filtering-paper, when a transparent, but slightly yellow, varnish will be obtained quite ready for use. The question may probably suggest itself to the reader whether the varnish might not be the better for a little "*ageing;*" but such is not the case with photographic varnishes, as a new varnish is better than an old one—first, because of the oxidation of the resin by exposure to air; secondly, on account of the colouration of the resinous solution by exposure to light; and, thirdly, because an old varnish is seldom of normal strength on account of evaporation of spirit. It sometimes happens that after this varnish has been prepared some months a little white deposit takes place: this, however, may be completely separated by a second filtration; and it is even sometimes enough to shake the flask to make it disappear. The preparation of this varnish on the large scale is surrounded by many difficulties, which need not be described here, as few amateurs will desire to prepare more than forty ounces at a time. In applying this varnish the negative should first be heated to such a temperature as can be conveniently borne by the hand, and this is most readily done by means of a spirit-lamp. If the plate be made too hot, seams are likely to be formed; if not hot enough, the varnish may "*chill*," and semi-opacity in some parts will be the consequence. In this part of the manipulation, however, the operator may safely allow himself to be guided by "his feelings:" the hand will indicate the temperature, which, to use an every-day expression, should be "as hot as you can hold it." If it be desired to communicate an agreeable odour to this varnish a few drops of oil of lavender or bergamot may be added. There is one precaution to be attended to in its use which is of great importance. An inexperienced amateur might imagine that, in the event of his obtaining seams on the negative through over-heating the glass, a second application of the varnish might remedy the defect: such, however, would not be the result; for, even in cases where the utter destruction of the film does not take place, the molecular arrangement of the silver forming the image is so disturbed as to destroy all the original vigour, and make the negative unfit for printing from.

A varnish containing the same materials as the foregoing, but in somewhat different proportions, has been successfully applied to transparent positives for the stereoscope, to replace the ground-glass with which they are generally mounted. It is composed as follows:—

Alcohol	100 parts by weight.
White lac	6 „ „
Picked sandarac	4 „ „

This mixture is warmed, and, when the solution is complete, filtered, and *applied cold*. The result, when dry, is an appearance like the finest ground-glass, bringing out the detail of the picture in the most perfect manner.

There is another varnish, for which there is a large consumption among photographers, claiming notice at our hands: it is the BLACK VARNISH used for backing up positives. It may be prepared by dissolving asphaltum, by the aid of heat, in twenty-five times its weight of oil of turpentine. Some photographers recommend the addition of about eight or ten per cent. of Canada balsam to this mixture. A good black varnish may also be made by dissolving asphaltum in benzole or coal-tar naphtha, in the same proportions indicated for the turpentine, and adding about five per cent. of India-rubber. The whole of the operations, however, connected with the preparation of black varnish are accompanied by such unpleasant smells and so much dirt that few amateurs will care to trouble themselves with the details of making it, but will choose rather to purchase one or other of the very excellent articles always to be found at the photographic warehouses.

In testing the qualities of these preparations it should be remembered that a good black varnish should admit of being applied with a brush, dry rapidly, and be entirely free from any tendency to split. This latter quality is generally possessed by those varnishes containing caoutchouc, and arises from the well-known tendency of that substance to contract when the moisture of the solvent has completely evaporated.

The experience of photographers seems to indicate the following as among the essential properties which should be possessed by a good photographic varnish:—It should consist of solid, transparent, resinous matter, free from colour, hard, and having no tendency to crack, dissolved in a menstruum, easily and rapidly vapourisable at ordinary temperatures. The film of resin deposited on the surface to be protected should of course have the properties described above as belonging to the natural resin—*i.e.* transparency, freedom from colour, &c.—before treatment with a solvent; and that varnish might fairly be deemed the best which, while possessing these essential qualities, would still leave the minimum amount of solid matter on the plate. In cases where it is desired to make a great number of impressions from the same negative, it is further necessary that the varnish should be composed of matter which does not alter the film upon which it is placed, and to which it should completely adhere. When it is quite dry it should present a perfectly brilliant surface, free from tackiness, and consequently not adhering to the paper with which it may come in contact. Its hardness should be sufficient to enable it to resist a slight concussion or abrasion, and it should have sufficient elasticity to prevent it from splitting or scaling off.

The properties last described are required in the ordinary commercial varnishes as well as in those applied to photography, which require other qualities quite special and of the first necessity.

1. It should be sufficiently fluid not to give too much transparency to the negative, and thus cause it to lose its vigour, and thick enough for the efficient protection of the collodion film.

2. As sensitised paper containing traces of moisture through imperfect drying is sometimes placed in contact with a negative, and then placed in the sun, it is necessary that the material composing the varnish should be insoluble in water, in order that no union should take place between it and the paper.

3. It should not become softened by a temperature of 140° to 212° Fah.

4. The solvents employed in the preparation of photographic varnishes should not resinify spontaneously, after the manner of linseed oil, but should be speedily and completely vapourisable.

Speaking generally, and in conclusion, on this subject we would say that, though good varnishes may be made by adopting the formulæ given in this paper, success in their manufacture is more likely to follow upon a careful study of the individual characters of the resins and solvents employed, and the exercise of judgment as to proportions in mixing founded upon the knowledge gained by that study.

There are few photographers who have not had to mourn over the destruction of their best negatives in the very act of doing that which was intended to preserve them. These untoward occurrences are rendered doubly annoying by their happening generally to the choicest results of probably a week's labour. They can, however, generally be traced to one or other of the following causes:—

1. Bad manipulation previous to varnishing—as, for instance, the presence in the film of traces of fixing agent through imperfect washing. 2. Varnishing the negative before it is dry. 3. Fixing with cyanide of potassium, being unsuitable for certain modifications of pyroxyline. 4. Drying and varnishing too hastily.

Therefore, if the following precautions be adopted much annoyance and loss may be avoided. It has been generally observed that where hyposulphite of soda is used as the fixing agent, and the negative washed freely and dried perfectly, cracking never takes place; but where cyanide has been employed, and the other operations have not had sufficient care bestowed upon them, splitting inevitably follows. It is well, however, whichever fixing agent is used, to wash thoroughly, dry completely, and, even in the case of varnishes which are applied cold, just to warm gently before pouring them on, in order to ensure the dissipation of what may be termed hygrometric moisture; in which case we think we may venture to assure our readers that the result so much to be deplored will never follow.

There is yet another source of failure in the varnishing of negatives arising from the employment of too strong a spirit for the solution of the resins, which on coming into contact with the pyroxyline of the film removes it entirely from the glass. The method for avoiding this is obviously the use of a weaker alcohol or ordinary methylated spirit.

It should further be remembered that good negatives are sometimes spoiled by printing under the direct heat of the sun, which acts either by partially fusing the resin of the varnish or by causing any trace of moisture retained by the paper to be volatilised, and thus adhesion to take place between the negative and paper. The precautions in this case are also obvious.

[Under this heading we propose from time to time treating of such subjects as may appear to be of pressing interest at the moment in connexion with the chemistry of the art.]

NEW PLATE-HOLDER.

Some years ago we were amused with a pamphlet having for its title "Photography with Clean Fingers." The object of the publication was to show how by the use of certain contrivances negatives might be taken without dabbling the fingers in any of the solutions; but unfortunately the use of the apparatus appeared to involve considerable skill in legerdemain. Mr. Solomon, of Red Lion Square, London, a well-known dealer in photographic apparatus, has however lately introduced an exceedingly simple and effective holder to use when developing plates, which really does to a very considerable extent save the fingers, and it has also the merit of being extremely easy to use, and very cheap in cost. It consists of a rod of wire, furnished at one end with a gutta-percha ferrule having a flattened ring projecting from it. This is firmly fixed to the end of the rod, while *upon* it *slides* a similar ferrule. The two are connected together by means of an elastic India-rubber ring. By sliding back the moveable piece a glass plate can be introduced with two of its opposite angles just in the flattened rings of gutta-percha, and it can be turned about in any direction and manipulated in the most facile way by the handle.

This is a valuable addition to our apparatus.

THE TAUPENOT PROCESS.

By G. Wardley.

[Read at a meeting of the Chorlton Photographic Association, September 12, 1861.]

The subject of this evening's paper has been somewhat severely dealt with by the numerous *ready* writers to our photographic journals—I think simply from the fact of there being a double operation in preparing the plates for the camera. Certainly the development is rather slow. A quick development possesses no advantage beyond saving a little time, and this is amply compensated for by the certainty of obtaining a negative.

To judge of the qualifications of this process in comparison with other dry processes, I cannot do otherwise than refer you to the present Exhibition of Photographs in connexion with the meetings of the British Association.

I beg to claim for this process a separate position amongst the dry methods. My plea is the following:—A sensitive surface for the camera consists of a "coagulated and iodised albumen film," supported upon a perfect film of "collodion" impregnated with iodide of silver—these two films acting together but having different functions to perform. The other dry processes (where collodion is used) being simply preserved collodion, the double film may possess an advantage by any defect in the collodion being counterbalanced by the perfect coagulated film of albumen, or *vice versa*.

The question has often been asked whether the picture exists in the albumen or collodion film? This is difficult to answer. Sometimes it appears in the albumen, other times in the collodion film. The picture appears more generally in the albumen, especially if a creamy collodion has been used for preparing the plate; but if we expose a prepared plate through the glass, so as to act upon the collodion first, we still obtain a picture, but the development is much slower, and before the iodide is removed the picture appears very strongly defined upon the collodion. This is best seen by examining the picture on the glass side of the plate. Hence it may be inferred that the iodised collodion film plays a very important part in connexion with the albumen. Pictures were obtained upon simple albumen many years ago, but the plates were difficult to manipulate: a tendency to spottiness from the slightest dust, and insensitiveness, were its principal defects. The application of a collodion film, impregnated with iodide of silver, has removed both these difficulties. This method of working was discovered by the late Dr. Taupenot, and the *modus operandi* which I am about to describe is almost identical with that which he so liberally gave to the world six years ago.

In bringing this subject before you I do not proclaim it an infallible process, for most of us know that photography is something like the young schoolboy, fond of playing tricks upon his master. We often learn more by one failure than years of continued success. Perhaps blistering of the film and limited keeping qualities are the greatest failings of this process: with care the former need rarely occur, but the latter is more uncertain.

The materials required in the first part of the operation are:—

CLEANING SOLUTION.

Rectified spirits of wine	2 ounces.
Tripoli powder, about	3 drachms.

An ordinary collodion bath, slightly or very acid, will answer the purpose.

Iodised collodion, rather thin, and containing a small proportion of alcohol: if newly iodised, it will be an improvement to add a little old, which will make it more adherent to the glass, and often prevent blistering. The collodion will become thick by use, when it must be diluted with pure ether, *without* any alcohol.

The iodised albumen is composed as follows:—

Whites of	10 eggs.
Water	2½ ounces.
Iodide of potassium	50 grains.
Bromide do.	10 ,,
Liquid ammonia	2 drachms.

Dissolve the salts in the water, then add the ammonia, finally mix with the albumen, and beat well up with a wisp or beater: allow it to settle and bottle for use.

The first part of the operation consists in cleaning the glass. This is effected by pouring on a little of the cleaning solution, and by means of a little cotton wool rub it over back, front, and edges, allow it to dry, and with another piece of cotton remove the superfluous tripoli, and polish with a clean wash-leather. This method of cleaning slightly scratches the glass, which will cause the collodion film to be more adherent. The plate must now be coated with collodion, which is done in the usual way: allow it to "set" well before plunging in the nitrate bath; if this precaution be neglected blisters will inevitably occur. The proper time to keep them out can easily be attained by one or two experiments; because, if the coated plate should be kept out of the bath too long, a transparent mark will occur upon the opposite corner of the plate to that from which the collodion has been poured. This mark, if produced, will be visible on removing the collodionised plate from the nitrate bath. A medium between these two conditions produces the best result. Lift the plate once or twice from the nitrate bath, and when the greasy appearance has disappeared from its surface drain and wash well in two dishes of running water, then transfer it to another dish containing a solution of iodide of potassium sixty grains, water forty ounces; wave the solution two or three times

over its surface, and leave it till another washed plate is ready to succeed it. This iodide solution will decompose any free nitrate of silver there may be left in the pores of the collodion. If any were allowed to remain, on coming in contact with the albumen a deleterious action would be set up, which would materially impair the keeping qualities of the plates, both before and after the second sensitising. Remove the plate from the iodide solution, swill with a little water, and drain for about two minutes. The plate is now ready for the albumen; filter through a sponge the quantity of iodised albumen required for immediate use; take the drained plate upon a plate-holder, and pour along one edge a little of the filtered albumen; sweep it along by inclining the plate; pour off, and put on a second lot; work it backward and forward once or twice, which will make it combine more intimately with the collodion. This second lot of albumen can be passed through a muslin filter and it will do for the first application of another plate: the first lot should be thrown away in consequence of being diluted with water from the plates. Drain the plate from the excess of albumen, or till the top corner begins to dry; finally dry before a clear bright fire so as to make the plate warm. This baking hardens the film, and in a great measure prevents blistering in after operations. This drying operation need *not* be conducted in the dark room, as these plates are not sensitive to white light after the albumenising. Some operators have declared that the whole of the operation can be conducted in ordinary daylight: I must beg leave to differ with them. Some time ago I made experiments with a view of settling this disputed point: the conclusion arrived at was—a ray of white light falling upon a sensitive collodion plate cannot be obliterated by an after application of an iodide solution, or even iodised albumen.

The albumenised plates will keep good a long time when protected from dust and deleterious vapours, and will be ready any moment to sensitise for the camera. This is accomplished by first slightly drying the plate before a fire, and then immersing in the aceto-nitrate bath for half-a-minute.

ACETO-NITRATE BATH :—

Nitrate of silver	30 grains.
Glacial acetic acid	½ drachm.
Water	1 ounce.

Drain and wash very well. It is convenient to first wash in a dish of water, and finally under a good stream from a tap. It is essential to remove all the free nitrate of silver from the face, back, and edges of the plate: if any were left, indelible stains would occur in developing, and the negative would be wanting in clearness and brilliancy. Careful washing will allow the plates to be kept much longer in a sensitive condition. After washing, drain upon clean blotting paper, and allow to dry spontaneously in a dark room or cupboard. If blisters should occur, they will be seen at this part of the operation, or when the plate is slightly drained.

The plate, when dry, is ready for the camera. When carefully prepared, they ought to keep good ten days to a fortnight in summer, and more than double that time in winter.

The sensitiveness and exposure is what we have now to deal with. The former, I believe, to be greater than any other dry process, except Hill Norris's extra-sensitive. The exposure varies so much with the class of subject, lens, stop, conditions of light, &c., that I cannot lay down any definite rule. The average for landscape work will be two or three minutes for a stereoscopic, and about ten minutes for a 10 by 8 picture. This process possesses considerable latitude in exposure, which can be corrected in development.

The development is best effected with pryogallic acid, though gallic acid is often used. The pyro. development is commenced by placing the exposed plate upon a levelling stand, and flooding the surface with clean water; pour the water off, and cover its surface with a three or four grain solution of pyrogallic acid, without either acetic or citric acid; pour on and off till the high lights of the image are well out, and continue the operation till the half-tones begin to appear. This will take place though no silver may have been added; but the picture will be extremely thin, and requires intensifying, which is accomplished by a solution of—

Pyrogallic acid	2 grains.
Citric acid	½ grain.
Water	1 ounce.

to which is added a few drops of—

Nitrate of silver	30 grains.
Citric acid	10 ,,
Water	1 ounce.

Pouring on and off as before, keeping the solution constantly on the move. The intensity will now rapidly increase, and any amount can readily be obtained by adding more of the silver solution. Stains, streaks, and singular marks often occur during development. To remove them it is only necessary to wash the developing solution off with water, and rub the surface with a tuft of fine cotton wool: the marks or deposit will disappear on washing the plate with a little more water. The development can be continued with the same solution, if bright and clear, though it may be discoloured: if muddy, a fresh lot must be mixed.

This process possesses great advantages by the hardness of film: negatives can be a long time developing, and invariably, under these circumstances, the film is covered with a superficial deposit of reduced silver, which can be cleaned off with cotton wool and water. If required, the development can be continued after this cleansing operation.

My treatment in developing an under or over-exposed picture somewhat differs from the advice often given. An under-exposed negative should be developed with very little silver; an over-exposure requires a large quantity, so as to intensify as quickly as possible.

To obtain the right intensity for a good printing negative requires practice and a little judgment. Negatives by this process must not be so intense as those produced upon wet collodion, the former being more chemically opaque than the latter. It is very unwise to judge of the strength by the sky; generally the best negatives possess thin skies. It is better to *slightly* under rather than over-develop, because a little extra intensity can be imparted to the negative after the iodide of silver is removed, providing the hypo. soda is well washed out of the film. This is easily accomplished by redeveloping with the pyro. and citric solution, to which is added a few drops of silver solution. A negative generally loses a little strength by removing the iodide of silver, especially if a creamy film of collodion has been used.

Fix with a solution of hyposulphite of soda one part, water four parts, to which has been added a few drops of acetic acid; wash well with water, and dry. A great number of prints can be taken from these negatives without varnishing, though a strong one would be improved by a coat of varnish.

The gallic acid development is conducted in a flat glass dish, containing a saturated solution of gallic acid, to which is added a few drops of plain silver solution. The plate should be face downwards, resting upon slips of glass. This method is more slower than pyro., but very certain. Some operators use it regularly.

Warm solutions for developing have recently been spoken of as a new invention. I cannot allow this opportunity to pass without saying that Mr. Mudd has used warm solutions for this purpose for nearly four years, and has continued their use ever since—that is, when the temperature or subject required such application.

PHOTOGRAPHS OF WAR SCENES.

The following strange scrap is extracted from *Humphrey's Journal:*—

"The public are indebted to Brady, of Broadway, for numerous excellent views of 'grim-visaged war.' He has been in Virginia with his camera, and many and spirited are the pictures he has taken. His are the only reliable records of the fight at Bull's Run. The correspondents of the rebel newspapers are sheer falsifiers, the correspondents of the Northern journals are not to be depended upon, and the correspondents of the English press are altogether worse than either; but Brady never misrepresents. He is to the campaigns of the republic what Vandermeulen was to the wars of Louis XIV. His pictures, though perhaps not as lasting as the battle pieces on the pyramids, will not the less immortalise those introduced in them.

"Brady has shown more pluck than many of the officers and soldiers who were in the fight. He went—not exactly like the "Sixty-ninth," stripped to the pants—but with his sleeves tucked up and his big camera directed upon every point of interest on the field. Some pretend, indeed, that it was this mysterious and formidable-looking instrument that produced the panic! The runaways, it is said, mistook it for the great steam gun, discharging 500 balls a minute, and incontinently took to their heels when they got within its focus! However this may be, it is certain that they did not get away from Brady as easily as they did from the enemy. He has fixed the cowards beyond the possibility of a doubt.

"Foremost amongst them the observer will perhaps notice the well-known correspondent of the London *Times*—the man who was celebrated for writing graphic letters when there was nobody by to contradict him, but who has proved, by his correspondence from this country, that but little confidence can be placed in his accounts. See him as he flies for dear life, with his notes sticking out of his pockets, spurring his wretched-looking steed, his hat gone, and himself the picture of abject despair!

"But, joking aside, this collection is the most curious and interesting we have ever seen. The groupings of entire regiments and divisions, within a space of a couple of feet square, present some of the most curious effects as yet produced in photography. Considering the circumstances under which they were taken, amidst the excitement, the rapid movements, and the smoke of the battle-field, there is nothing to compare with them in their powerful contrasts of light and shade."

THE CONSTITUTION OF THE SOLAR ATMOSPHERE AS REVEALED BY SPECTRUM ANALYSIS.*

By Samuel Highley, F.G.S., F.C.S., &c.

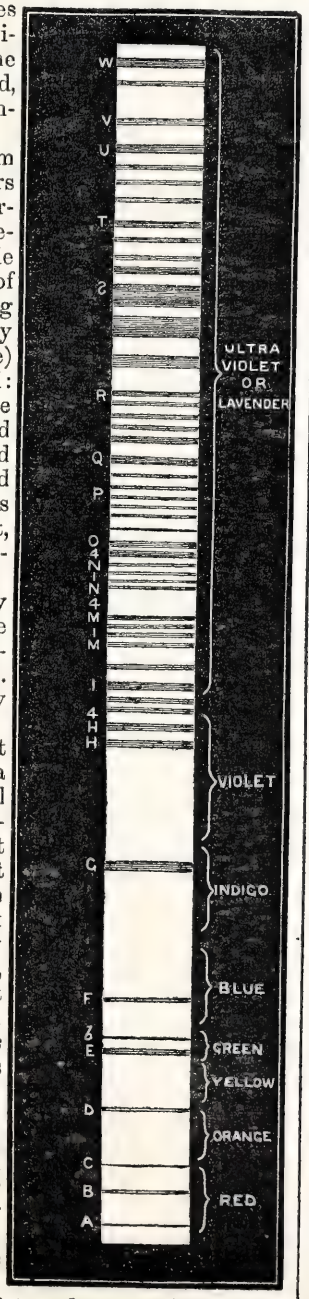
(Continued from page 303.)

To produce these lines of Fraunhofer, it is necessary to form a spectrum by a more delicate arrangement than that recommended in the previous experiment. The light of the sun must be admitted into the darkened room (or into the spectroscope hereafter described), through a slit about $\frac{1}{20}$ of an inch wide, formed by two plates of metal ground to *knife* (or rather, chisel-like) *edges*, placed perfectly par-

* As Professor Miller has gone over the same ground as myself in his lecture before the British Association, it is necessary to state that this article was *in type* on the 9th of September.—S. H.

allel to each other; a prism of quartz or first-rate flint glass inserted in the path of the beam of light, with its refracting edge adjusted so as to stand perfectly parallel with the edges of the slit, and in such a position that the light makes the same angle with the first surface of the prism when it falls upon it as it does with the second surface when it leaves it (or in technical language, *the angle of incidence must equal the angle of emergence*); and the resulting spectrum examined by an astronomical telescope of low power, placed at from three to twenty feet distance from the slit. If the prism be of quartz, a spectrum of great length may, with proper manipulation, be observed intersected by numerous dark bands, of which the more important are represented in *Fig.* 2. If, however, the prism be of flint glass, a portion only of the spectrum, known as *the visible spectrum*, extending from A to I (including the extreme red to the extreme violet), will be seen, as glass is opaque to the *invisible*, ultra-violet, or lavender rays.

FIG. 2.



Fraunhofer ascertained that these lines are altogether independent of the magnitude of the refracting angle, or of the media of which the prism was constructed, and that their number, order, and intensity, are constant for *solar* light.

The principal lines of the solar spectrum are conventionally indicated by the letters A a., B, C, &c., and the larger intermediate lines by numbers 1, 2, 3, &c., beginning afresh on the more refrangible side of each letter, so that the position of any solar line may be indicated (referring to such maps as those lately published by Sir David Brewster and Dr. Gladstone) by a combination of a letter and numeral: thus we speak of the line A, or the double line D, or C 6, or b 30 (a group beyond E). Certain difficultly-observable red rays, less refrangible than A, are denoted in Brewster's map by Z, Y, X, thus working backward in the alphabet, from the beginning of the visible spectrum at A.

If an incandescent *liquid* or *solid* body be examined by a spectroscope, it will be found to give a continuous bright spectrum, but utterly devoid of dark lines. The reason of this will be presently apparent.

If, however, by the same instrument we examine certain bodies when in a *volatalised* or *gaseous* condition, we shall find that, instead of presenting a continuous spectrum, only a few bright *coloured* bands will be apparent, and it has been found that such bands vary in colour, number, and position, but that they are always *characteristic* of the body examined. Of course red, yellow, green, blue, or violet bands appear in that part of the spectra that would correspond with the same coloured portion of a *continuous* spectrum; but the red band that presents itself when volatalised lithium is examined, occupies a different part of the red portion of the spectrum to that which the red band produced by volatalised potassium would occupy, and so on for other coloured bands produced by other bodies: and it is thus we are enabled to distinguish the bands characteristic of one body from that of another.

It has long been known to the chemist and pyrotechnist that certain salts impart characteristic colours to the bodies, spirituous or otherwise, with which they may be burnt: thus lithium salts produce a crimson flame, sodium salts a yellow flame, barium salts a green flame, and potassium salts a purple flame, when introduced into a gas jet, burnt with warm spirits of wine or with gun-paper that has been saturated with solution of these compounds. Merz has lately attempted to give greater precision to such indications, so that they may be used by the analyst when a rough-and-ready method is all that circumstances require. He employs either a Bunsen gas-burner or a flame of pure hydrogen gas, and in addition, as occasion indicates, also uses glasses coloured red, green, blue, and violet. He divides the colours into three or four standard groups: in Bunsen's burner he indicates *a*, Border Colours, or those that give a coloured indication when the substance is held on a platinum loop about $\frac{1}{10}$ or $\frac{1}{8}$ of an inch from the outer portion of the lower part of the flame; such indications are peculiar only to the most volatile substances—*b*, Mantle Colours, which present themselves when the substance is held in the bright blue mantle that forms the outer portion of the flame—*c*, Flame Colours, produced when the loop is held horizontally in the hottest part of the mantle—and *d*, Core Colours, which are only produced with the pure hydrogen flame (and as far as is yet known with sulphuric and phosphoric acids) when the body on the loop communicates colour to the cold core of the jet. By this method Merz has discovered that nitric, chromic, molybdic, sulphuric, and phosphoric acids give *characteristic* colours to the standard flames, beside previously known bodies.

But such methods are rough when compared with that of spectrum analysis, to which Bunsen and Kirchhoff have recently recalled the attention of chemists so forcibly. I say *re-called*, for years ago English and continental philosophers employed the prism as an instrument of analytical research, and by its agency determined the characteristic spectra of many metallic and elementary bodies; but their papers were read or published at a time when Science had not become "Popular," and when physical instruments were not so familiar in the laboratory of the chemist as at the present day. But the microscope and polariscope have paved the way for the spectroscope, and as soon as it had taken shape and form it was welcomed as a friend that would save both time and trouble in many a "preliminary assay," when the laborious method of qualitative analysis must otherwise have been followed, before proceeding to a quantitative research. The Editor of the *Chemical News* has lately called the attention of his readers to the early investigations of Fox Talbot, Wheatstone, and Miller, *On the Spectra of Artificial Light from Different Sources*, and it is remarkable to find how much has been done—and *forgotten*; for only a few months since similar experiments and theories published by the Heidelberg *savans*, Bunsen and Kirchhoff, were regarded by many as entirely new, but Truth—like murder—will out.

Englishmen who have any patriotism in their souls have to thank Mr. Crookes for having asserted the claims of his own countrymen to a share (and a very large share too) of the honour that is due to those who have laboured to lay the foundation of the structure that is to be hereafter reared on this new field of research. Like an enthusiastic traveller on an Egyptian plain, he has exhumed papers that were as defunct as any mummy ever brought to the British Museum, and has brought to light "*inscriptions*" that are prophetic of the discoveries of to-day; for it is to be regretted that there are a few English professors who, either from having reaped their science on foreign soil or influenced by the fashion of looking too smilingly on things continental, seem, both in their lectures and writings, to be too ready to ignore the labours of their colleagues and fellow-countrymen.

Brewster and Herschel* seem to have been among the earliest to employ the prism in determining the characteristics of coloured flames; for in his "Treatise on Light" in the *Encyclopædia Metropolitana*, published in 1827, Sir John Herschel describes the spectra of various metals when their chlorides were introduced into flames, and adds "the colours thus communicated by different bases to flame afford in many cases *a ready and neat way of detecting extremely minute quantities of them.*" But in a communication contributed to Brewster's Journal (vol. v.) for 1826, Fox Talbot definitely points out the *yellow* ray characteristic of soda, the *red* ray of potash, and the *orange* ray of strontia, and adds:—

"This red ray appears to possess a definite refrangibility and *to be characteristic* of the salts of potash, as the yellow ray is of the salts of soda, although from its feeble illuminating power *it is only to be detected with a prism.* If this should be admitted, I would further suggest that, whenever the prism shows a homogeneous ray of any colour to exist in a flame, this ray *indicates the formation or the presence of a definite chemical compound.*" "If this opinion (that the orange ray is due to strontia) should be correct, and applicable to the other definite rays, *a glance at the prismatic spectrum of a flame may show it to contain substances which it would otherwise require a laborious chemical analysis to detect.*"

In a subsequent paper published in the *Philosophical Magazine* for 1834 (Third Series, Vol. IV. p. 114), Talbot draws the distinction that is to be observed between the red ray characteristic of lithia and those indicative of strontia, although the red flames

* See *Transactions of the Royal Society of Edinburgh* for 1822.

produced by these two substances are undistinguishable from each other by the unassisted eye, and, after stating that the strontia spectrum is furthermore specialised by an orange and bright blue ray, concludes by saying:—

"Hence, I hesitate not to say *that optical analysis can distinguish the minutest portions of these two substances from each other with as much certainty, if not more, than any other known methoa.*"

In other communications he describes the spectra of cyanogen to be distinguished by the violet end being separated into three portions, with broad dark intervals between, the last of the violet bands, widely separated from the others, being much refracted towards the invisible portion of the spectrum; the spectra of copper, boracic acid, and baryta to have a somewhat general resemblance, but characterised by numerous dark lines; and the flames of gold, copper, silver, and zinc, produced by deflagration in the voltaic circuit, to be characterised by peculiar definite rays, silver giving two green rays of different refrangibility, and zinc one red and three blue rays, besides several more of other colours. These latter investigations were carried on by Talbot at the laboratory of the Royal Institution in 1834, and were published in the *Philosophical Magazine* in 1836 (Third Series, Vol. IX. p. 3).

In 1835 Professor Wheatstone read a paper before the British Association, *On the Prismatic Decomposition of the Electric, Voltaic, and Electro-magnetic Sparks*, on which occasion a diagram was exhibited of the bright lines of the spectrum, of the magneto-electric spark taken from different melted metals, and observed with a prismatic telescope similar in arrangement to that employed by Fraunhofer, wherein it was recorded that MERCURY presented two orange, one green, two bluish-green, one very bright purple, and one violet, rays; LEAD—two green of different refrangibility, one bluish-green, one purple, and one very bright violet; BISMUTH—one very faint yellowish-green, three green, one faint, and one bright blue, one faint, and one very faint violet; TIN—one orange, two yellowish-green, two bright bluish-green, one blue, and one bright purple; ZINC—one red, two very faint yellowish-green, two bluish-green, and one blue; CADMIUM—one faint red, one green, and two blue rays.

Professor Wheatstone observes:—"These differences are so obvious that any one metal may instantly be distinguished from the others by the appearance of its spark (spectra); *and we have here a mode of discriminating metallic bodies more ready even than a chemical examination, and which may be hereafter employed for useful purposes.*"

In the same paper he expresses his opinion that the *bright* lines of the electric spectrum are due to the nature of the substance between which the spark is produced.

(To be continued.)

INSTANTANEOUS COLLODION WITH IODIDE OF IRON

By M. EUGENE SAHLER.

IN our contemporary, *La Revue Photographique*, a letter from the above-named gentleman appears in substance as follows:—

"I have found the means of obtaining an instantaneous collodion in employing the iodide of iron in a nascent state prepared in the collodion itself. If the method has never before been given, you can, if you think proper, make it public. The results are always certain, and superior to those from the employment of iodide of iron of commerce, the instability of which is one cause of continual failures.

"I bruise, in a porcelain mortar, to a very fine powder, protosulphate of iron, of which the formula is Fe O, SO_3 + 7 HO, and of which the equivalent with reference to hydrogen is 139.

"In the same manner I reduce to a powder iodide of barium; formula Ba I, equivalent 195.

"Mixing then equivalents of these tried salts, or 139 grains of pure neutral protosulphate of iron with 195 grains of iodide of barium in a convenient quantity of ether and alcohol, double decomposition does not delay taking place, the iodide of iron dissolved, and the sulphate of barytes completely insoluble, is precipitated.

"After having filtered this sensitising liquor I add the requisite quantity of pyroxyline, and the collodion is ready for use.

"The rule which guides me in judging the proper quantity of iodide is the following:—The quantity of sulphate of iron above indicated gives 154 grains of iodide of iron.

"Collodion, with bromide and iodide of iron, is prepared in the same way, taking bromide of barium only one-fourth the quantity of the iodide employed—thirty-six grains to thirty-four grains of protosulphate of iron.

"It is important that quantities should be weighed exactly, and the equivalents carefully observed. If the sulphate be in excess, the sensitising liquor is poor in quality; if on the other hand there is too much iodide, nitrate of barytes is formed in the silver bath—a salt but little soluble, remaining partly in the collodion, forming a disagreeable spottiness, and even a marked crystallisation if the quantity be considerable."

Is it not rather late in the day to introduce this *novelty?* We fancy that Mr. Machonochie used it some eight or nine years ago. One other question we would ask also—How does the silver bath behave after the visits of numerous plates coated with this collodion?

ACCIDENTS WHICH OCCUR WHEN THE GREATEST SENSITIVENESS IS DESIRED.*

By M. Mc-A. GAUDIN.

A SILVER bath strictly neutral gives a general fog at the time of development. It is positively necessary to acidulate the bath, but to the least degree, in order to obtain the greatest sensitiveness. Nitrate of silver dissolved and crystallised anew will immediately produce the proper bath; but the crystallised nitrate which is sold in Paris is seldom of this kind. We must then, when we have dissolved and saturated it with iodide, add to it a very small portion of carbonate of soda, and afterwards render it acid by one or two drops of nitric acid to each litre, or rather more if acetic acid be employed.

Having resolved to acidulate with nitric acid only, to avoid the formation of acetate of silver, which sometimes becomes so inconvenient, I was much astonished to find again this acetate of silver which had hindered me from working the whole day. After preparing a new bath, first neutralised with carbonate of soda and acidulated with nitric acid, I poured it into my gutta-percha dish, without having rinsed it at the bottom. I was surprised, on examining the film of the sensitive collodion, to see it covered with a number of glistening points, which continued in spite of the agitation of the plate in the bath; and these points formed for a number of days upon the negative. The negative was pierced with them, and, on examining it through the magnifying glass, I discovered that each white point was formed by a small crystal implanted in the film of the collodion. I attributed this result to the collodion, but on making use of another collodion the effect was the same. The effect must then proceed from the bath, and on examining my dish I found it covered with small microscopic crystals, which detached themselves on the agitation of the bath, and planted themselves immovably in the still soft film of the collodion. A fresh cleansing of the bath diminished the quantity, but did not make them entirely disappear. I then thought of the acetate of lead, which dissolves the acetate of silver. A slight addition of this salt made these crystals disappear as if by enchantment. They arose from a weak portion of the preceding bath, acidulated by the acetic acid, which had undergone a reaction in the presence of a new bath free from acetic acid, which undoubtedly possesses to a slight degree the property of dissolving the acetate of silver in the same manner as the acetate of lead.

The next day I found an impediment no less extraordinary. I tried a new bath with my small apparatus, with which I recognised an extreme sensitiveness. The proofs were perfectly clear, with the backgrounds very intense, while in using the same bath, the same collodion, and the same developer, the proofs for the stereoscope were always weak and foggy. This fog was formed by some parallel and distorted streaks, which I could not attribute to negligence in the cleansing of the plates, which had been finished in every way with the greatest care.

I should add that, for six weeks, this difference between my small apparatus and that for the stereoscope had constantly presented itself, so that I was forced to conclude that the framework of this apparatus possessed an injurious influence—so far was I from imagining the real cause.

Having already, and with success, made use of gutta-percha dishes with the same apparatus, and the new dish that I employed having been, as an additional precaution, varnished with gum-lac, I had no uneasiness on that score. However, all my failures happened from this dish.

Gutta-percha alone is a bad material with which to make the dishes. It naturally contains a great deal of tannin, and nothing is so bad for the silver baths as a reducing agent, in however small a portion. We very well know that new dishes of this kind are worth nothing from the commencement; but their nature is of

* From *La Lumiere.*

such a kind, that their use is for ever impracticable. Of this sort is the one of which I made use in the last experiment: its varnish seemed to have disappeared. The bath remained clear, but the impressions only appeared with reluctance where I made use of it.

In order to decide the question I made a last trial, taking well into consideration that, for my small apparatus, the bath was in a china dish, whilst for the binocular apparatus the same bath was poured into a gutta-percha dish. With a new bath, slightly acidulated with nitric acid, my small apparatus gave me, as usual, some superb proofs. The first proof for the stereoscope was passable, but with a faintly-marked background. The following proofs were more and more weak and foggy. I then changed the bath in my dish by pouring into it from that of the gutta-percha dish; and I then had also with my small apparatus a foggy proof.

By this decisive trial I have at last discovered that the repeated failures which I attributed so much to the collodion, to the cleansing of the plates, and to the apparatus, were traced to a certainty to the dish. After that, I decided to exclude for ever the use of gutta-percha dishes for the silver bath.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

SUBORDINATION—ATMOSPHERICAL EFFECT NOT THE SOLE ORIGIN THEREOF — ON CERTAIN ERRORS MORE PARTICULARLY PREVALENT AMONG OUR OPTICAL WRITERS—SEEING *versus* OBSERVING—FIDELITY OF DEFINITION: ITS USE AND ITS ABUSE—ON WHITE AND BLACK AS ELEMENTS IN SECURING SUBORDINATION.

"The great object of composition being always to secure unity, that is to make of many things one whole, the first mode in which this can be effected is by determining that one feature shall be more important than all the rest, and that the others shall group with it in *subordinate* positions."—*Ruskin.*

"Pictures are not to be judged by the strict laws of optics: they are altogether conventional. In nature we cannot look at the distance and the foreground without *imperceptibly* altering the focus of the eye, neither can we look at two portions of a picture at the same moment, with attention, without altering the direction of the eye. It will therefore be sufficient if our studies give the general appearance."—*G. Barnard.*

MY DEAR FELLOW-STUDENT,

I have so far shown that, like painting and other kindred arts, photography derives its highest value rather from an intellectual than a mechanical process, and, in continuing our studies, I hope to impress this still more forcibly upon your mind.*

In my last the subject of aërial perspective was *partially* discussed and explained; and, as the purpose of these letters will not permit me to give to this or any *one* branch of our study the attention its importance might otherwise demand, we may as well proceed to consider our next great element of pictorial effect, viz., SUBORDINATION.

Speaking of productions deficient in the appearance of air, I said, as you may remember, that each discordant part seemed to battle "for superiority over the rest," and, in other words, that the gradation or *subordination* derived from atmospherical effect was entirely absent; but there are other reasons why this subordination is of importance to pictorial truth and beauty, which reasons we will now take into our consideration.

In the first place, to render our ideas clear and definite we must endeavour to clear away certain very prevalent errors which are just now becoming a source of some little bewilderment and confusion.

It is very common with those who are ignorant of the principles of pictorial art, and *still more common with those who argue solely from their knowledge of optical science*, to suppose that it is the province of the picture-maker to give such a representation of the images of nature as a single glance may originate upon the retina of the eye. Mr. Sutton, in commenting upon some remarks of my own, recently fell into the same error, and argued, because when the eye was directed towards the distance the foreground could not be seen with the same degree of distinctness, that therefore in *all* landscape pictures *distances* ought to be "*sharp*" or well defined, and *foregrounds* "fuzzy" or without definition. Considering the subject from an optical stand point, and speaking of the eye as a mere lens for depicting *mechanically* the images without upon the retina within, Mr. Sutton may possibly have been right; but this gentleman, in his eagerness to get out of a certain corner, overlooked the fact that the eye is not like a mere lens and camera, in itself the absolute and only source of vision, and thus quite ignored the existence of that vitally *important* visual agent, THE MIND,† forgetting also aërial perspective, and that the human eye does in the most minute fraction of a minute adjust itself *instinctively* to every plane of the view before it. Now, if Mr. Sutton, and those who support his peculiar views, will but give this matter a little more earnest attention, they must surely see their grave and mischievous error. I say grave and mischievous, because there are those who look up to these scientific men with a kind of reverence and awe as oracular beings whom it is sacrilege to doubt and presumption to dispute with.

But there are certain facts which a little thought must make patent to us all, and which show at once the mistaken character of such very partial views—to which facts I shall now call your attention.

Whatever the laws of optical science may prove in reference to *vision*, it is quite certain (as you may easily discover) that in the act of *observing* the mind is at any given instant of time absolutely and simply occupied and affected entirely by the one definite *feeling* impressed upon it by the combined effect of many objects as ONE WHOLE. The several parts in detail, and even the great masses, do not (although some assert of the latter that they do) affect the mind with any definite idea; for immediately the attention is directed to any single part of a scene, or to any one particular object therein, instantly the specific effect of the whole has passed away. Suppose, for instance, the object which attracts the attention is a tree, your observation then becomes exclusively occupied, not with the trunk, branches, or leaves, *as parts*, but with that tree as *a whole*, separate both from the landscape around it and the minor details which form its component parts. This tree thus becomes to the mind a complete thing in itself. But upon the observation reverting back to the general scene it falls immediately into its place as a part only: its details are no longer recognised, and the tree, producing no special individual effect upon the mind, merges into the general effect characterising the complete landscape. To sum up: it is impossible to contemplate objects collectively and separately at the same instant of time, although, owing to the inconceivable rapidity with which the mind is successively influenced in the process of observing, an unthinking person might easily imagine otherwise. I hope these facts are sufficient to show the folly of endeavouring to depict upon the photographer's glass or the painter's canvas such an image as the eye is said to receive in a single glance, inasmuch as we should by so doing represent an almost purely mental as a purely mechanical operation, and there "would be no truth in us."

But this argument of mine does not tend to show that minuteness of detail, or exactness in the delineation of form, or precision of imitation of any kind, is ineffective and useless; because such details and such completeness combine to produce the general effect, and because the eye varies its point of attention while the *picture* is before it, just as it would were the *real scene* actually there. Your object being to reproduce not only the scene as it exists, but its actual effect as influencing the spectator's mind, the minutest detail has its share in your purpose. Still, although such a share must by no means be ignored, it must, of course, be subservient and *subordinate*, lest the spectator's attention should become bewildered by a confused and jostling crowd of conflicting effects, forbidding the eye a single resting place, and he should turn away from your work bewildered and displeased. To prevent any such result arising from truthfulness of imitation and perfection of detail, the great painters of the past originated the law I am endeavouring to establish in your esteem under the title of *subordination*.

The importance of aërial effect, as influencing subordination, I have already pointed out: we have now therefore to consider the same in reference to *light and shade*, to *proportion*, to *symmetry*, and to *harmony*.

First, then, in reference to light and shade, Fresnoy tells us—

"Fair in the front, in all the blaze of light,
The hero of your piece should meet the sight"—

alluding to that prominence which the pale and more luminous

* As if to strengthen my hands in fighting the battle of landscape photography against those who would reduce this art to a mere question of process and apparatus, Mr. Robinson, of Leamington, has just forwarded to me one of the most exquisite specimens of pure landscape art that ever gladdened an artist's eye; and Mr. Mudd, of Manchester, has also sent me half-a-dozen of his rarely-equalled productions. Mr. Robinson's picture (*Early Spring*) fully illustrates how the mind may be affected by the sentiment and beauty of a truthful picture, in the same way as it is affected by th descriptive piece of a real poet; and Mr. Mudd's pictures will go far to illustrate the subject of my last letter. My best thanks are due to them both, and I wish I could hope that my pen might do half such good service in the cause of art-photography as their beautiful pictures must be effecting. However, I may not, perhaps, prove an unworthy labourer; and, after all, the pen has more than once done good service in aiding both art and artists.

† See my remarks on seeing pictorially in a former letter.

tones have when associated with the more sombre and less luminous. He again urges the importance of this fact, by adding—

"Learn hence to paint the parts that meet the view,
In spheric forms of bright and equal hue:
While from the light receding, or the eye,
The sinking outlines take a fainter dye.
Lost and confused, progressively they fade,
Not fall precipitate from light to shade."

And he exhibits its importance in reference to gradation or subordination, when he adds—

"Permit not two conspicuous lights to shine
With rival radiance in the same design;
But yield to one alone the power to blaze,
And spread the extensive vigour of its rays.
There, where the noblest figures are displayed,
Thence gild the distant parts, and lessening fade;
As fade the beams which Phœbus from the east,
Flings vivid forth to light the distant west:
Gradual those vivid beams forget to shine,
So gradual let thy pictured lights decline."

You will easily perceive that such directions were intended to apply more particular to "historic" or figure painting; but the principle, although variously applied, is of equal value in every branch of art. The importance of white, when aided by sombre tones, in giving prominence to anything which ought to advance before surrounding objects, and so catch the spectator's eye more readily, is again enforced by the poet in the following lines:—

"White, when it shines with unstained lustre near,
May bear an object back or bring it near:
Aided by black it to the front aspires,
That aid withdrawn, it distantly retires."

And to show how pure black in giving white, by contrast, to lighter tones also gives them prominence in the same degree, he continues:—

"But black, unmixed, of darkest midnight hue,
Still calls each object nearer to the view."

If you have, as I certainly think you ought to have, a copy of Mr. Robinson's charming little photograph, *Early Spring*, you may find in it a very capital illustration of the value white has in guiding the spectator's eye into the picture, and in securing subordination. On the pebbly strand of a placid stream stands a girl, with her water jug: her turned-up dress reveals its white lining, which is rendered more prominent by forcible contrast with a dark petticoat; and this piece of white, echoed delicately in the water below, is carried away softly towards the front. Now, when this is concealed, instantly all the little touches of white in the water and between the boughs of the overhanging trees become converted into points of attraction, *each one equal to its neighbour;* and so subordination meets with an untimely end. Uncover again this morsel of contrasted white, and you will at once see how valuable it is—how it throws back the distance; and, keeping each respective part subservient, actually makes the great charm of the picture. It was with this view, undoubtedly, that Mr. Robinson arranged and posed this particular model.

But though white contrasted with black is so useful a servant, you must watch it zealously and hoard it with a miser's care, as will be shown when our studies are directed to that of "Tone." But I must now conclude, reserving the further treatment of this matter for the next communication of yours, very faithfully,

ALFRED H. WALL.

Exhibitions.

EXHIBITION OF PHOTOGRAPHS AT MANCHESTER IN CONNEXION WITH THE MEETING OF THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

BY OUR EYE-WITNESS AT MANCHESTER.

We will now proceed to make a few remarks more in detail than our former notice permitted; and in doing so shall endeavour to avoid as much as possible reiteration of what we have said before.

Rydal Church and Nabscar, *Wordsworth's House*, *Bridge House*, *Ambleside*, &c., by Mr. Faulkner. This gentleman has only recently taken up photography, and has much to learn, especially in the management of his lenses.

Mr. Kershaw's *Lincoln Cathedral* is very clear and free from distortion. His *Manchester Infirmary* and *Dunham Mill* will not compare with other views of the same subjects in the room, the shades being too dark and the water too chalky.

Mr. Buxton's Egyptian views are very beautiful, particularly his *Great Court of Medineet Aboo*, and the *Memnonium at Thebes*, the *Temple of Esculapius*, and other views at Philœ, the "Tivoli of Egypt," as Mr. Milnes so poetically styles it. The *Two Memnons* are worthy of a larger representation, but the one given here is very good. The *Nile Boat* is the worst of the series. The *Cataracts of the Nile* is an exceeding fine picture: the huge blocks of stone scattered about by the hand of Nature seem to vie with the havoc caused by time in the ruined temples. The pictorial inscriptions in some of the views are very well brought out, and afford ample scope for the student of such hieroglyphics. *Thebes.*—The fallen greatness of the city of the sun is well portrayed in several of the views. *The Pylon at Carnac* is a noble relic of Egyptian architecture. Since our last we regret to have been undeceived with regard to one of Mr. Buxton's pictures, which we mentioned as having a fine effect of streaming sunbeams. This we find is owing to an accidental access of light to the negative, which has been made so good a use of by the printer that we could almost mistake the picture for one of Mr. Bartlett's drawings.

There is here the *Express Boat* (Taupenôt), by Mr. Kibble—an extraordinary instantaneous picture.

To speak in detail of Mr. Mudd's pictures is a hopeless task, their excellence is so uniform and their beauties so innumerable. We must, however, select his *Bridge at Dunkeld*, and other views in that neighbourhood, as particularly worthy of notice. It must be a very Eden for photographers: all seems so placid that a failure would hardly disturb the photographic equanimity. *Eskdale, from Birker Fell.*—This is a large panoramic picture taken at two operations from one centre: the difficulties are well overcome, the printing is nicely managed, and the joining is scarcely visible. *Valley of the Tay.*—Some natural clouds in this and one or two others of Mr. Mudd's deserves more than a passing notice. The effect produced is not very pleasing, although extremely natural. We believe the negatives were taken with a $\frac{3}{4}$-in. stop and thirty seconds' exposure. As soon as any cloud-marking is perceived the development is stopped, and that of the foreground, which is under-exposed, is pushed on rapidly with warm water; and when it has reached the same tone as the clouds both are intensified together. Cloud pictures *(pur et simple)* obtained in this way would be valuable to artists who have frequently difficulty in transferring to canvas the fleeting forms of the cloudy regions. *A Study from Nature*—a perfect background for a pic-nic. A pre-Raphaelite would revel in a bit like this, but his minutest pencillings of leaf and spray cannot rival the perfect mirror of nature here produced. *Borrowdale.*—The atmospheric effect in this picture is, we think, very fine indeed. *The Silent Pool*—a little too chalky, but replete with indescribable beauties. *The Screes, Wastwater.*—The water in this is very black, but is not unsuited to the solemnity of the scene, over which a Stygian darkness often broods. *Bowdon Church.*—This fine picture will always call up regrets that the original edifice has disappeared before the "improvements" of the restorer.

H. Miller's *Glodaeth*, *Tabley Old Hall*, *Llangollen Bridge*, and *Rostrevor Bridge*, are evidently the work of a young photographer, whose works are severely tested by the hanging committee placing them so near their splendid neighbours, Mr. Mudd's pictures. They have many good points, which should encourage the artist to persevere in the path which he has begun to tread. The last is really a very good picture, and does the artist credit.

Llandaff Cathedral.—Major Ashton has successfully contended with some difficulties of situation, and has produced a pleasing picture.

Chepstow Castle.—This picture has a very artistic foreground, and, together with all Mr. Sidebotham's pictures, is worthy of all admiration. It is of large size, 22 inches by 14, is a pleasing scene, and is well worked out. Mr. Sidebotham is one of the most careful and successful operators we know: to a thorough knowledge of chemistry as regards photography, and the painstaking perseverance of an enthusiast, he unites the skill of an experienced adept, and there is scarcely any department of photography, not to name other sciences, in which he has not made considerable progress. His is one of those spirits we would not like to miss from the circle of our friends, and we hope his career in the scientific world may be as long as it has been successful. In this place, though out of order, we would refer to one of the screens in which are some copies of Mr. Nasmyth's etchings by Mr. Sidebotham. As etchings they have extraordinary merits, but as photographic reproductions they have almost microscopic beauties. *Rocks at Holyhead.*—This picture, and another of *Contorted Strata* in the same locality, by Mr. Sidebotham, are full of interest to the geologist. In Mr. Sidebotham's *South Stack Lighthouse* there is a deficiency of atmosphere.

Mr. Wardley has managed to make a fine picture of a most incongruous building, *Manchester Infirmary*, in which, however, the bronze statue is much too dark.

Kenilworth, and *Ancient House at Warwick*, by W. M. Rae.—This gentleman is, we understand, but a novice in the art: his progress must, we consider, be deemed very satisfactory. We would, however, advise him to forbear exhibiting his *Pitville Spa* any more: the whites, in some cases, require softening. The *Town Hall at Maestricht* is an exception, which we like very much. We do not admire his choice of position in *Guy's Cliff*, which, however, we presume was forced upon him, and the subject is not one of those which we would have chosen at the risk of artistic failure. The cognisance of the "bear and ragged staff," on the front of the old house, has a very curious stereoscopic effect, and seems to be quite an afterthought of the artist.

A. Neild.—From the early connexion of this artist with photography we expected more from him: his *Coltsfoot Leaves*, however, makes a beautiful bit of foreground.

High Tor, Derbyshire.—Mr. Mann has evidently reached a high degree of perfection before he modified his manipulation. Of his process in collodio-abumen this is a satisfactory specimen, and we would advise him to adhere to the original process. This is an excellent example of his style, as is also a *Schooner on the Sands*, which has been mistaken for an instantaneous picture on a dry plate.

Mr. Clarke's pictures are all admirably printed, but some are very deficient in arrangement: a little more attention to this would obviate the bad effects sometimes perceptible of distortion by the lens and introduction of gables. One of his pictures is a fine study for the architectural student—the true swell and proportion of the columns being apparent on measurement. The "Auld Toon" is vividly brought under our notice in these fine pictures, and one can realise Scott's description of an Edinburgh wynd at once:—"The passage, in which they stood, had a window to the close, which admitted a little light in the daytime and a villanous compound of smells at all times." Some ghosts of horses and passengers in the Grassmarket have by no means a pleasing effect. *Cardinal Beaton's House.* We consider this one of Mr. Clarke's best. Mr. Clarke rather overdoes the introduction of artificial skies; in one, however, that of *Princes Street, Edinburgh*, he has produced such a pleasing effect that we are inclined to forgive him the use of the unphotographic brush.

Patterdale Churchyard (Mr. Wardley) is a piece of study which would delight Mr. Harding with its trees, and might almost inspire a Gray with another elegy.

Millbeck, Langdale, by A. F. Smith.—We do not at all admire this picture and so pass on, first naming his *View on the Irwell.* We would hardly expect such a beautiful scene on such a river. It is a very choice photograph.

Free Trade Hall, Manchsteer, by G. Wardley.—A well contrived view of a fine building, but one which is very difficult to manage.

Eagle Crags, Borrowdale, by G. Wardley.—In this a fine aërial effect is given, which shows great care in the manipulation.

The Bowder Stone, by G. Wardley.—A small shrub on the summit of this geological monster has a singular effect, like smoke. In this, as in many others, the stay-at-home traveller may find "sermons in stones."

Two of Mr. Fenton's fruit pictures which are here are better than his landscapes, and are good witnesses in favour of the party which regards photography as a fine art—the marks of a master are so strongly impressed thereon.—We are sorely tempted to beg the "loan of a bite" of Mr. F.'s apples.

We do not think the *Lady of Shalott* has been done justice to in Mr. Robinson's picture. We do not mean to be uncomplimentary to the model, who seems also to have figured as *Elaine with the Shield of Sir Launcelot*, but she is of too earthly a mould to have disposed of herself in any such style: the boldness of her writing on the boat's prow is sufficient proof of this. No maiden distraught with such feelings could have executed such an inscription. Mr. Robinson gives us a good photograph, but not a good poetical conception of the poet's genius. The background strikes us as rather too heavy.

Holiday Rambles, by Mr. Cottam, and various stereographs by Mr. Underwood.—Mr. Cottam's frame and those of Mr. Underwood are hung respectively too high and too low. Those of the former are not bad specimens of the hot-water process, and exhibit great variety of subject; and Mr. Underwood's views are exceedingly well chosen and uniformly printed. We would, however, recommend these gentlemen to try their skill with larger cameras.

We shall never treat the oxymel process with favouritism, having had many failures with it ourselves; but it is here shown that good results may be obtained with it, as Mr. Mann certainly proves. The *Old Mill, near Dunham*, is a very artistic study.

With all due respect to Mr. Petschler's perseverance, we are unable to declare ourselves satisfied with his process. The shades in many of his pictures are often much too intense, and an uniform grey seems to spread itself over them, completely obliterating the high lights. The pictures of *Haddon* and *Chatsworth* are the best. *Matlock High Tor* also competes with Mr. Mann's view of the same subject by a different process. We think the process well suited to copying, of which he exhibits some good specimens. Knowing Mr. Petschler well, we cannot help stating our strong faith in his capabilities as well fitted for success in any branch of photography to which he may apply himself.

We should have been glad to have seen more of Mr. Consterdine's productions. His *Conway Castle* is a very good picture. We hope he has not permanently taken to Hill Norris's plates in preference to preparing his own.

Mr. Hebert we know to be a co-worker with Mr. Parry, and we should have preferred some of his transparencies to those views of *Dovedale, St. Etienne*, &c., which do not do justice to this very convenient process.

Old Church, St. Brelade's, Jersey.—One of the worst views Mr. Sutton could have chosen to show off his new lens. Always considering photography to give true perspective, we cannot agree with a theory which seems to our apprehension to give curved in place of right lines. We have here a church which we may represent by a straight line, and we are not aware of any mode of placing a straight line so that all its component points shall be equidistant from one point, *i. e.*, the point of sight; yet it seems impossible to view this print rightly without curving it and placing the eye in the centre—indeed we understood Mr. Ross's assistant to admit this, in reply to the Astronomer Royal's question in the sectional meeting. If this be so, pictures so constructed must be, for all practical purposes, useless. It is possible to have too much included in the field of view, as with other good things. We are not of that class which holds the painter of the "Bolt in Tun" right in depicting both ends of that famous butt on the signboard. Mr. Sutton's camera, as made by Mr. Ross, is a very ingenious affair; but we fear it offers difficulties which will prevent its general adoption.

Conway Castle, &c.—These pictures we remember seeing some years ago, and regret Mr. Compton does not exhibit more recent ones.

West Door, Kirkstall Abbey (Mr. Sisson's process), and *Loch Ranza* (tannin process), by Mr. Annan.—As illustrations of new processes we are glad to see these pictures, but they serve only to heighten our appreciation of the old ones. There is a want of sunshine in the latter which the clouds from a second negative do not diminish. *Elaine Gazing on the Shield of Sir Launcelot.*—This picture is by no means so ambitious as usual. It is to be admired for its simplicity of treatment and the pleasing nature of the composition, though we think we recognise the *Lady of Shalott* again.

Chirk Castle, View of Llangollen, &c.—Mr. Alfieri's camera campestra has been employed with advantage by Mr. Albin, who uses wet collodion and an iron developer. The *Valle Crucis Abbey* is a very good specimen.

Kirkstall Abbey, Lowood, Windermere, Kirkstall Pass. and *Windsor Castle*, by R. Fenton.—We regret to say anything disparaging of this veteran's productions, but really a very different feeling is excited by these pictures to that which we should wish. Every artist should exhibit his best; but these are only valuable as showing the attainments of Mr. Fenton some time since, and as such are links in the photographic chain. Having been exhibited over and over again they have become weather-beaten and grimy, and present altogether a dispiriting appearance.

Aberfoyle (wet collodion), by Mr. Annan.—Common consent seems to have invested this picture with the blue ribbon of merit in this Exhibition. The sky is printed from a second negative, and is well put in and in harmony with the rest of the view, which has a very good distance, both middle and extreme, but the foreground is rather deficient in conspicuous objects. We must leave the readers of Rob Roy, which category includes all our own, to people the fertile plain with the characters of the romance, and to those with whom the affray at the Change House is familiar. This will be no difficult task, especially aided by one of G. Cruickshank's pictures of the interior, which one may almost suppose to be that of them both in the centre of the view; at all events, if they do not recognise it, we are sure Baillie Nicol Jarvie, in the saut market o' Glasgow, or Andrew Fairservice would.

Mr. Piper's *Old Curiosity Shop* is indeed a medley and a beautiful picture too. There are, in the front of an old shop, kept by one Fenton, at Bury St. Edmunds, "suits of mail standing like ghosts

here and there, fantastic carvings brought from monkish cloisters, rusted weapons of various kinds, distorted figures in wood and china, and iron and ivory, tapestry and strange furniture that might have been designed in dreams." The artist might surely have improvised a Little Nell and her old Grandfather, to make the picture a worthy illustration of Dickens.

Monument at Mansfield, *View at Brislington*, &c., and *Bust of Tennyson*.—Mr. Tyley's sculptural subjects are exceedingly fine: no doubt he possesses some unusual advantages in this branch.

With one or two exceptions, the instantaneous pictures by Smyth and Blanchard look too much like moonlight; but they are admirable specimens of *chiaroscuro*, as exhibited in the broad firmament above our heads.

Bust of Professor Sedgwick, by W. Jeffrey.—This is a very fine photograph, and well exhibits the utility of the art to the sculptor.

St. Leonard's and *Hastings*, by Arthur Neild.—This gentleman is, we believe, connected with the Manchester Photographic Society. He has apparently not done much in photography lately, and so exhibits his old pictures. Whoever named these two pictures has omitted a very meaning preposition from the title. We cannot see how three strips of house, promenade, and shingle can represent St. Leonard's; and a timber yard is no more Hastings than the Portico is Manchester—and there is not much to admire in them, photographically speaking.

Two river scenes by Mr. Wilson, with Dallmeyer's new lens, are to be specially commended for pictorial as well as photographic excellence. The large angle they embrace is remarkable. They deserve a little more careful printing.

On the Thames at Maidenhead.—Two views of very simple subjects, by Mr. Heath, which were greatly admired. It were well that photographers generally should follow the example of Mr. Heath, and not "let vaulting ambition overleap itself" in the choice of subjects.

The Glaciers, with a Party Ascending, is rather a poor specimen of Messrs. Bisson's skill. The figures too much resemble the *ombres diaboliques* which our neighbours are so fond of.

Chapter House, *Furness*, and *Views on the Duddon*, are specimens, by Mr. Hooper, of the turpentine waxed-paper process. They are somewhat deficient in details, and have chalky lights, which are not agreeable. Mr. Sheard also exhibits *Furness Abbey*, by the same process.

Dalhousie Castle, by Mr. Kinnear.—This subject is vignetted in printing—a style we do not generally admire.*

Old Bee Hives, *Ludlow*, by Mr. Sidebotham.—This we deem the best picture among those from waxed-paper negatives: it is so clear and bright that we at first assigned it to wet collodion.

Tintern Abbey, and *Gateway of Raglan Castle*, by Mr. Sidebotham.—Oft-repeated subjects, well treated.

Raglan Castle, by Mr. Sidebotham.—A very neat picture, with good perspective.

Near here is a landscape, very fairly coloured, by Mr. Briggs, who, we hope, will not neglect this branch of art, though we are not inclined to commend the spoiling of good photographs for the purpose. There are many bad ones which would be kept out of sight if the art were a little more practised.

Calotypes, by Mr. Buckle.—These are old landscapes which find many admirers, who now have to lament that the artist's hand is cold.

Insanity.—These are highly interesting examples of the great utility of photography to the psychological student, and exhibit in a striking manner the melancholy effects of the most terrible calamity which flesh is heir to. It could hardly be expected that such subjects would give good pictures: these are, however, very fair, and might well be studied with good effect with some photographic illustrations of a paper *On the Encephalon of Mammalia*, read in one of the sections.

Portraits on ivory and in oil.—Of the large group of officers so deservedly admired we have before spoken. Mr. Brothers' great success in portrait-photography is remarkable in many respects, and his fine photographs are exceedingly good; but he will excuse us for giving a word of advice to the artists employed as well as to himself. We do not use our own words, and of course the remarks apply to all the artists in this department: at the same time we are bound to say we have seldom if ever seen these ivory pictures surpassed:—"The success of a portrait depends upon the sitter as well as the painter, and may be spoiled by the bad taste of the one or the other. Excellence in portraiture consists in placing every feature in its proper place, in correctness of modelling, in judicious arrangement of light and shade suited to the complexion, in tasteful attire, and unaffected and simple attitude. No defect is more striking than a forced and affected attitude. In every portrait the countenance should constitute the picture: all accessories must be kept subordinate to the principal object." Photographers are generally great sinners in this last particular.

Messrs. Smith and Blanchard contribute some portraits enlarged by the solar camera, which, had they been treated in a proper style by the artist, might have shown the advantages of enlargement to the fullest extent; but they are coloured in a crude manner, which is not pleasing.

Portrait of a Lady, by H. Hering.—A neat specimen, resembling a litho-tint print.

Proffeser Owen (sic).—One of Maull and Polyblank's very effective pictures. The orthography of the label made this conspicuous.

The Earl of Derby and *Lord Brougham*, by Mayall.—So much has been said in praise of these excellent portraits that we would not add to it. We wish we could say the same of the very bilious-looking album *Portraits of the Royal Family*, by the same artist.

Mr. Hering's album portraits are excellent; but we must except one, in which the most prominent feature is the interior of——a gentleman's hat.

Mr. Eastham's large portrait of *F. Crossley, Esq.*, was admired, but it is not to our taste.

Among the portraits is a positive, on glass, of *Mr. Nasmyth*, by Mr. Sidebotham. We should not omit to mention a very good hand, from nature, serving as an index or pointer round the room—a "notion" we recommend for use at other Exhibitions.

Messrs. Caldesi have three portraits of actors—*Fechter*, *Gassier*, and *Webster*. They are very good, and the costumes are not unnecessarily obtrusive, except in one case, where parti-coloured hose has caused a difficulty. The aqua-tinted ground on which they are mounted is very neat and appropriate.

Two portraits of the *Right Hon. Mr. Moncreiff*, by Holt and McGlashan, we consider the best modern portraits in the room; and we regret that the style does not receive more encouragement from the public.

The early calotype portraits, by Hill and Adamson, are worthy of all commendation. They are examples of what ought to be done in portraiture. Subsequent progress in the art is not marked by the same features of artistic excellence which characterises these fine pictures.

The first screen is occupied by Colonel Sir H. James's reproductions of maps and MS., all highly interesting and satisfactory in their way.

One side of the second screen is covered by the copies of the *Liber Studiorum* of Turner, of which—as well as of some of the cartoons of Raphael, to be found in this room—enough has already been said.

On the other side are specimens of Pretsch's process, and some fine copies by Ponting, Spencer, Bedford, Thurston Thompson, and A. Brothers, and one of Mr. Tyley's mural monuments, which is a very good example.

Mr. Hering occupies the whole of the third screen with copies of engravings—all very fine, especially the pictures of the *Cumæan Sybil* and the *Mater Amabilis* of S. Ferrato, and Wilkie's well-known *Blind Fiddler*. There is also a curious picture of a silver cradle, by Mr. Sharpe.

The fourth screen contains some more of Mr. Tyley's pictures, and some specimens by Mr. F. H. Morgan, which we must allude to as very choice. His *Chagford Bridge* and *Rising Mist* are both good. One of Mr. Fenton's best will be found here—it is *The Foot of Windermere*. On the reverse side of this screen is a curious collection of photographic wonders—examples of varied developments, by Mr. Mercer; some enlargements of microscopic obects, by Mr. J. R. Tracy; some peculiar pictures from the exhibitions in Scotland in 1855-6-7; and a large number of Mr. Dancer's micro-photographs, which should, we think, have been shown under the microscope upon the tables, on which there were two of his instruments: and here, in like manner, might have been mounted some pillar stereoscopes for transparencies, of which Mr. Parry was the only exhibitor, but his specimens were very beautiful.

There were also on another table some very early collodion positives, by Mr. Sidebotham; and that gentleman lent a *Vue Generale de Roma*, on silver, by Daguerre himself, who, if he could but don once more "this mortal coil," and visit such an Exhibition as this, could not fail to be astonished at the prodigious progress made since his day.

This Exhibition was to be a "complete and trustworthy exponent of the present state of photographic art, and of the steps by

* We differ emphatically from our *collaborateur* upon this point—except for stereographic purposes.—Ed.

which it has obtained its now popular and important position." We think that this has hardly been realised in extent. We have visited much larger collections. On running over the ground again we find there have been less than 700 pictures shown, counting a frame of portraits as one only, and that these are the work of about 70 artists. This is a small number to represent such a constituency, and we miss many names which ought to have been represented. Cundall, Howlett,* Llewellyn, White, Dolamore, Alinari, Melhuish, Frith, Raven, Lake Price, Rejlander, Lyndon Smith, Sedgfield, Watkins, to say nothing of a legion of others, are all absent; and, when we consider that many of the pictures shown are contributed by the owners, not the artists, we are inclined the less to overlook the omission.

Some time ago we had the pleasure of inspecting the portfolio of the Society, which contains many remarkable productions which we should have been glad to have seen on these walls. We shall have to contrive to ferret them out of their concealment, and tell our readers of what they consist. How the Committee came to forget this portfolio we cannot imagine: we are sure the Society would have lent it. A little management would have prevented much disappointment in another way. The placards, announcing the Exhibition to "continue open until Saturday next," remained visible upon the Saturday, and, we believe, prevented many going on the last day, under the belief that they had still a week in which to go. The advertisements to the same effect were repeated on the last day. These are all deviations from "that business-like precision for which the men of Manchester are celebrated," and for which a contemporary gives them credit.

We do not wish to undervalue the success which this Exhibition has attained; but, considering previous Exhibitions, we had larger expectations from this than have been quite realised. At the Manchester Society's Exhibition in 1856 there were near seven hundred pictures and about fifty exhibitors; at the Exhibition in London this year, which we visited, there were six hundred and twenty-three pictures, and one hundred and seven exhibitors.

A contemporary, we see, finds an excuse for the absence of a catalogue in the "temporary character and purpose of the Exhibition." We think the purpose, as indicated by the circular of May last, was far from temporary, whatever the character of the Exhibition may have been; and we regret much that each visitor was not enabled to take away with him a cheap and comprehensive hand-book of the valuable collection now dispersed.

The absence of any special allusion to photography in the President's opening address has been before alluded to in this Journal. We must add, also, that in closing the business of the Manchester meeting there were no thanks given to the gentlemen whose arduous labours resulted in this Exhibition. We therefore take it upon ourselves to thank them, both as members of the British Association and as fellow-workers in photography. We are sure that all the visitors whose appreciation is worth anything will join with us in so doing.

OUR EYE-WITNESS AT ST. HELEN'S.

Your eye-witness, before quitting the subject of the Manchester meeting, would fain be permitted to record the pleasure he experienced on one of the excursions with other members of that peripatetic body. He had a choice of coal mines, salt mines, chemical and glass works, and a visit to the Earl of Ellesmere, at Worsley. Your eye-witness, having always an eye to the *utile* before the *dulce*, at once declined the Earl's proffered hospitality, and, as in photographic duty bound, took an early train to St. Helen's. At least one hundred other members accompanied your eye-witness, and their united testimony will no doubt be freely given, if called upon, in support of your eye-witness's evidence in favour of the great courtesy displayed by the good people at St. Helen's to their visitors. Not content with providing the "feast of reason" in throwing open their large workshops and laboratories, they promoted the "flow of soul" by a substantial dinner at the hostelrie of the Raven, to which your eye-witness did more justice than his modesty will allow him to say he does to his present theme. The train passed rapidly to its destination, and our courteous entertainers soon introduced us to the manufacture of soda in various forms at Messrs. Kurtz's works.—First, carbonate of soda from its sulphate. This is an eminently photographic drug, and your eye-witness was considerably puzzled in watching it through the different stages —first salt thrown into a hot furnace, with sulphuric acid constantly applied, being thus converted into Glauber's salts (sulphate of soda, the hydrochloric acid being evolved in the process); then mixed with chalk and small coal; then heated again, this time to fusion, becoming ball soda or black ash, containing twenty-two per cent. of alkali; then broken up and washed with warm water, and boiled to dryness; then again heated; then crystallised and broken up; then exposed to the carbonic acid gas in a sort of *grotto del cane*, into which your eye-witness was not permitted to enter; and finally dried, when it is fit for neutralising silver baths, or for printing, &c. All this boiling, and roasting, and lixiviating was attended with much heat, considerably above that in which your eye-witness chooses usually to abide. Another chemical works was visited (Messrs. Gamble and Sons'), and more processes viewed with as much minuteness as before; but your space must not be trespassed upon in describing them. We must mention, however, that we ascended to the summit of one of the coke columns used for condensing the muriatic acid, and there was a contrivance which might be appropriated to print washing. Your readers know that water is kept trickling down the interior of these columns: it is admitted at the top through a tap into a V shaped trough, nicely balanced, the equilibrium of which is converted from stable to unstable by its being filled with the water, when it turns over and sends its contents down among the coke. In the chlorate of potash department a very similar contrivance was made to keep a couple of pumps in a kind of perpetual motion. Your eye-witness made a point of taking a homœopathic dose of Epsom salts made here, followed by some chlorate of potash by way of antidote.

Your eye-witness then visited Messrs. Pilkington's sheet glass manufactory, and watched with wonder the "skill and dexterity" of the workers standing on the edge of pits, and swinging their gatherings about to elongate them to the cylindrical form, which is afterwards cut down the middle and flattened in the furnace, and made suitable for the photographic consumption of your many readers. The union of fire and water comes very close here, the almost liquid glass on the pontil being cooled with water on the smoothening block or marver.

The painting and making of coloured windows was then inspected by your eye-witness and friends, who were especially pleased with certain enlarged photographs from the *Art Journal*, used by one of the artists to the establishment, who has hit upon some plan of burning-in outline photographs, the secret of which we could not penetrate. Your eye-witness, but for the heat, would not mind a short apprenticeship to the glass manufacture, if it were only to learn a few of the secrets of which that wonderful indispensable product seems almost to be made.

Your eye-witness was then conducted to the silver and copper smelting and refining works of Messrs. Bibby. The latter metal has not, we believe, much photographic use, but we examined with interest the separation of the nobler metal, silver, from its baser alloy by Patterson's patent process of crystallisation, and we saw some 14,000 ounces in a state of ebullition in a large crucible; and, like the man who never regarded ducks but with a view to peas, wondered how many pictures could be produced with it. We were allowed to see it cooling, when it presented a most beautiful sight, and we suppose it would then be cast into ingots, and probably some of it may be hereafter employed by Messrs. Petschler and Mann, or some other of your eye-witness's photographic acquaintance.

The copper smelting works was a very Tartarus for heat, and we were glad to get out, and, after a cool refreshing walk, plunged into caloric, of still greater intensity, if possible, at the Union Plate-glass Works, where your eye-witness beheld the processes of melting, casting, rolling, grinding, polishing, and silvering, and was, by the kindness of the manager, Mr. Yates, permitted to carry away sundry translucent specimens of crystal. Your eye-witness must not forget the two powerful engines which drive the massive-polishing machines. The casting of a large sheet of glass was the sight of the day, and will long remain in our memory.

It is due to our entertainers that we should place their names on record as above, the more so as we believe there is not much difficulty in gaining permission to visit the establishments at any time, provided always that it is not for the purpose of prying into trade secrets, which, of course, was not our object. Your eye-witness's thanks are due, and are hereby presented, to the above-named gentlemen, and also to Messrs. Sinclair and Shanks, who acted as hosts, and to Dr. Calvert and Dr. Smith, whose clear explanations rendered their guidance extremely valuable.

Thus ended one of the pleasantest things connected with the visit of the British Association to Manchester—at least so far as concerned your eye-witness. Σ

* Our eye-witness does not appear to be aware that Mr. Howlett died above two years ago.—Ed.

Photographic Olla Podrida.

EXHIBITION GOSSIP.—The medals will be of one class, for merit, without any distinction of degree. The awards will be published, early in June, at a public ceremonial in the Exhibition building, and the medals will be delivered to the exhibitors on the last day of the Exhibition. There are to be three catalogues: the Industrial, the Illustrated, and the Fine Arts. Advertisements, set up in ruby type, will be charged £5 for ten lines, or under, and £50 for one page, for issues of 250,000 copies of the Industrial Catalogue; ten shillings for ten lines, or £5 for one page, in the descriptive part of the Illustrated Catalogue; or ten shillings for five lines or under, or £10 for a whole page, in the advertising portion of that catalogue.

IRON IODISER.—Dr. Woods, in his paper on micrometers, refers to an iron iodiser he introduced in 1844, of which we append the formula:—Take sulphate of iron forty grains, iodide of potassium twenty-four grains, and common salt six grains; powder and mix them well together; add alcohol two ounces, ether two drachms, liquor ammoniæ three drops; after the precipitate has subsided, add one part of the clear liquor to three parts of a collodion that has been prepared by adding a fluid drachm of a saturated solution of common salt to four ounces of collodion: with this employ a thirty-grain to the ounce nitrate bath, and a twenty-grain to the ounce sulphate of iron developer.

WORKS ILLUSTRATED BY PHOTOGRAPHS.—Besides Hessling and Kollmann's *Atlas of Photo-micrographs*, Rudinger's work *On the Nervous System*, illustrated with photographs from the dead subject by Albert, of Munich, a photographically illustrated edition of *Schiller's Poems*, and Unger's *Ideal Views of the Primitive World*, have also lately been issued to the public by various publishers at home and abroad. Messrs. Longmans & Co. have just published *Twenty-Four Views of the Vegetation of the Coasts and Islands of the Pacific*, being photographic reductions from the plates of Kittlitz, with descriptive letterpress by Berthold Seemann. The latter work is of as great interest to the botanist as the former are to the paleontologist, anatomist, and microscopist.

A FRENCH IDEA.—In translating an article from our pages of the 15th of July, the *Bulletin de la Société Française* quotes it with a formal heading as "par M. COUNTRY PARSON!"

TONING BATH FOR BLACK AND WHITE PRINTS.—Before toning remove all free nitrate of silver. Chloride of gold one grain, bicarbonate of soda ten grains, to twelve ounces of water.

MONSTER TRIPLE ACHROMATIC LENS.—Mr. Dallmeyer has just completed for the Government establishment at South Kensington a triple achromatic combination of sixty inches focal length, for the production of pictures three feet square. It consists of three combinations—the front and back being of six and eight inches diameter respectively, whilst the diameter of the central or negative combination is four inches in diameter. We have lately seen at Messrs. Ottewill and Co.'s establishment the bellows-bodied camera with which this lens is to be used. It is of proportionate dimensions, and focussed by an endless screw. The base-board tapers from front to back, and is formed of an interlacing system of triangles, so as to secure the utmost rigidity and to prevent any tendency to warping.

ACID PLATE CLEANERS.—If glass plates have to be cleaned with acids care must be taken that they receive a final washing in a slightly alkaline solution; for acid is found to adhere obstinately to the glass, and then causes a collodion film to peel on being placed in the silver bath.

TO PREVENT PAPER CURLING when on the sensitising bath, breathe on the back of it, and it will instantly lie flat; after the last washing, roll it on a stick, albumen side out, and in ten minutes its inclination to curl will cease.

BERTSCH'S AUTOMATIC CAMERA.—Some time since a description appeared in these columns of M. Bertsch's apparatus. He has now completed the arrangement by adding a travelling laboratory that measures only ten inches in length by four inches in width, and fourteen inches in height, within which packs the camera, troughs, and chemicals sufficient for taking one hundred negatives. The camera itself is only four inches square. S. H.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE first monthly meeting of the present session of this Association was held on Wednesday evening, the 18th ult., at Myddleton Hall, Upper-street, Islington. George Shadbolt, Esq., Vice-President, occupied the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were proposed, and duly elected members of the Association:—Mr. A. Seeley, Mr. J. Biddle, Mr. H. J. Vachell, Capt. Herne, Rev. S. C. Browne, and Mr. Gandy.

The Chairman then introduced to the meeting some proofs of printed matter and ruled lines from negatives by Grubb's C portrait lens, with an aperture of two inches and one inch. They were entirely free from curvature of the lines, and exhibited great flatness of field, &c. The Chairman also exhibited specimens of Mr. Lyndon Smith's printing by development.

Mr. Dallmeyer exhibited six views by Mr. George Wilson, of Aberdeen—size, 7 by 4½—taken with his No. 1 triple achromatic lens, 7¾ focus (equivalent). One of them was an instantaneous view of the channel fleet, in Plymouth Sound, taken without any stop. There was also one of large dimensions of Netley Abbey, by an amateur, and a map measuring 11½ by 7.

Mr. DALLMEYER begged to state that, owing to the absence of Mr. Wilson from home, he was unable to procure what he considered more favourable specimens; but, at the kind invitation of the President, he had brought those he had by him to submit to them this evening. The excellencies in them to which he wished to call attention consisted in an entire absence of all distortion; perfection of definition up to the corners; large angle of picture included; and general vigour and crispness of photograph, which, he thought, showed that the triple achromatic lens possessed those qualities as much as any single view lens, and the instantaneous view would dispose of the question as to its being a slow working lens.

The CHAIRMAN then introduced the specimens received from Mr. Charles A. Seely, of New York, the American Correspondent of THE BRITISH JOURNAL OF PHOTOGRAPHY, intended as evidence of the working of Harrison's lens, alleged to include an angle of picture embracing 90° of subject. Many of the members would recollect the remarks he (the speaker) had made with reference thereto; and he thought that any one accustomed to observing phenomena connected with optical matters would agree with him in asserting that the pictures before them did not include anything approaching to 90° of subject, although in one specimen the entire circular disc that the lens would cover was included. He would remark that he entirely exonerated Mr. Seely from any attempt to deceive; and, indeed, he had received a letter from that gentleman, which arrived one day too late for insertion in the last number of the Journal, in some sort explanatory of the matter. Mr. Harrison, it appears, had declined to allow the lens to be examined, although applied to for the purpose by Mr. Seely. The 90° of picture was assumed, upon the understanding that the lens was of but two and a-half inches focus. The Chairman said, "No doubt, here was the source of error." It was very possible that the plate was not more than two and a-half inches from the back lens of the combination; but that was a very different thing from being only two and a-half inches equivalent focus. For anything to the contrary at present before them the equivalent focus might be six or seven inches.

Mr. DALLMEYER, on looking at the proofs, thought that the Chairman had been liberal in his estimate of the angle included, when reduced to a parallelogram, by calling it 45°. He questioned whether it would be much above 40°.

The chair having been temporarily occupied by Mr. Shave,

Mr. SHADBOLT read a paper by Dr. Maddox, of Southampton, *On Experiments with Albumen on Glass* [see page 336], and circulated the specimens forwarded in illustration.

It was stated that the paper was elicited by Mr. Negretti's remarks on the superiority of the albumen process for printing transparencies.

Mr. WHARTON SIMPSON observed that it appeared to claim special advantages from the use of phosphoric acid in place of acetic acid.

A vote of thanks was awarded to Dr. Maddox.

Mr. Solomon exhibited two large pictures as specimens of the turpentine waxed-paper process, taken with a Grubb's aplanatic lens by Mr. Hooper, of Manchester; and some new plate-holders, for use when developing, of novel construction. [See page 339.]

Mr. SIMPSON commended the last-named as being the best yet introduced.

Some specimens by the resin process were then exhibited by Mr. Barnett.

M. HISLOP offered a few laudatory remarks on the resin process—its ease, certainty, and especially its rapidity of development. He used Ponting's collodion, with the addition of half-a-grain of ordinary resin to each ounce of collodion, and developed with citro-pyrogallic acid.

The CHAIRMAN observed that the use of resin was originally suggested by the Abbé Despratz, as causing the collodion to adhere more firmly to the plate; whereas the ready loosening of the film was notorious. The process was a pet one with the Liverpool photographers, several of whom had been highly successful in its practice. He alluded particularly to Mr. Corey and Mr. Glover, and he had no doubt they would be gratified at having made converts of Mr. Hislop and Mr. Barnett.

Mr. HISLOP thought that there was certainly less trouble with this than any other dry process whatever. Six weeks had been the longest

test he had applied to the keeping powers of these plates. He found it necessary to varnish the edge of the plate, but the process was free from any tendency to blistering.

On a Member asking what was supposed to be the peculiar use of the resin if it did not cause the film to adhere, the CHAIRMAN replied that it was the opinion of Mr. Glover that the picric acid contained therein was the really useful agent.

Mr. Morley exhibited some plates by the collodio-albumen, or rather Fothergill process, which had been washed with gallic acid before exposure, and some which had been washed with tannic acid. The strength of washing solution was one grain to the ounce of water. The results were somewhat in favour of the gallic acid solution, there being less tendency to solarisation than with tannic acid.

The usual votes of thanks were accorded, and the proceedings terminated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held on Sept. 4th, Mr. Ramage in the chair.

Mr. John Lennie was admitted a member.

Mr. SLIGHT then made some remarks—

On the Hot Water Process.

He said:—In attempting to become an exponent of a lately re-introduced process in photography, I feel my own shortcomings to be greater than I at first anticipated, as there are many points in connexion with it on which I feel very much at a loss, and which I ought to have studied more fully before attempting to explain. Every one who practises photography on a small scale, and at uncertain intervals, must know that new difficulties are always arising; and it may therefore be some palliation of my want of preparation to state that the process, in its present form, has been but a short time before the public, and that some of my difficulties are not yet twenty-four hours' old.

There is no necessity for tracing the history of the hot water process further than to mention that a notice appeared in No. 143, Vol. VIII., of THE BRITISH JOURNAL OF PHOTOGRAPHY, calling attention to it as a good though overlooked process, and recommending it for its simplicity. Very soon after, on trying it, I found it so simple, and to work so well, that I have scarcely tried any other since then.

The details of the process are so clearly given in No. 146, Vol. VIII., of THE BRITISH JOURNAL OF PHOTOGRAPHY, that I need do little more than allude to them. The glasses must be made quite clean; but there is no necessity of roughening the edges to make the film adhere. The coating and sensitising are the same as for the Fothergill process, already so ably described to the Society by Mr. Burns; although, as regards the collodion, I imagine that a thin sample gives the clearest pictures, as I have diluted ordinary negative collodion with alcohol and ether, and considered it improved thereby in the cleanness of the picture. After sensitising, the plate is laid in a bath of distilled water, and may be agitated until all greasiness has disappeared: it is then thoroughly washed by having water poured on it, and may be allowed to soak for a short time in a large quantity of water, as is recommended for most effectually removing the free silver. The plate is then partially drained on blotting-paper, and albumen applied, as in the Fothergill process. I have always used the albumen prepared in the proportion of the white of one egg to two ounces of water and about ten drops of ammonia. After being frothed and allowed to settle, add nitrate of silver, as recommended by Mr. Hannaford in No. 146 of THE BRITISH JOURNAL OF PHOTOGRAPHY. I have lately been saving the albumen after its being used, and find it will answer very well for a few times; but after being kept for a week or two it gets of a reddish colour, and, I think, is then acted on by the developer in those parts of the plate which ought to be transparent, and is therefore unsuitable for transparencies. This discolouring and evil result may have been caused by the frequent exposure of the albumen to daylight, which must act on the nitrate of silver held in solution. After the application of the albumen, the plate is again drained for about half a minute, giving time for the preparation of its hot plunge bath of water, nearly boiling, in which it remains for a few seconds to coagulate the albumen, and afterwards drained on blotting-paper, and dried at a red fire. If allowed to stand until it begins to dry spontaneously, and then held to the fire, the plate is apt to have lines of unequal development between the wet and dry parts; and in drying at the fire it ought to be steadily exposed to the heat. When dry, the plate is nearly transparent, and of a bluish tinge. The exposure in the camera is about the same as for the Fothergill plates; but I fancy that the time may be increased without risk of injury.

My stereoscopic camera has single achromatic lenses of five-inch focus, and quarter-inch stops, with which an exposure of six minutes, in a moderately good light, appears sufficient, but twice or three times that exposure may be required in such a light as we had last Saturday at Hawthornden.

In developing the picture, the plate is wetted and the ordinary negative developer applied, say water one ounce, pyrogallic acid one grain, citric acid half-grain, glacial acetic acid six drops. After they have been once or twice poured over the plate, add a very little nitrate of silver solution, and use a fresh supply of developer when the first gets discoloured. When sufficiently developed wash well and fix with cyanide.

The hot water process has, as a recommendation, considerable simplicity of manipulation and something like certainty in the results, while to the beginner it has the inestimable property of causing the film to adhere most tenaciously to the glass, admitting of any amount of rough washing.

I cannot speak positively as to the keeping qualities of the plates so prepared; but I think that in a few weeks they get either less sensitive or become more difficult to develop, but on this point my experiments are as yet inconclusive.

In regard to the use of coagulating the albumen, there does appear to be some virtue in the hot water, as on preparing a plate and only dipping one-half into hot water, the part so dipped was more darkened by the developer than the other part which was left cold and unwashed.

Mr. SLIGHT, at the termination of his observations, went through the whole process of preparing a plate, exposing to the gas under a negative, and developing. The result was a finely-toned stereoscopic transparency.

Mr. NICOL remarked that the few attempts he had made with this process had been so successful as to make him think highly favourably of it. It seemed to be more workable than any process he had ever tried before, from the fact that the development might be carried on to a greater extent, and a slight stain might be wiped off. This process was just the Taupenôt without the iodiser in the albumen; and, from the great hardness of the film, it would save the trouble of varnishing—at least, when only two or three impressions were wanted from a negative. The only fault was the protracted development, which, no doubt, arose from the difficulty of penetrating the albumen film.

Mr. TAYLOR stated that he had not experienced the difficulty just alluded to by Mr. Nicol—that of a protracted development; this might arise from his adopting a slightly different method of preparing his plates. After exciting, he washed the plate only very partially; and, without allowing much draining, coated with albumen (in which there was no silver whatever), and at once immersed in the hot water bath. In developing he discarded acetic acid altogether, using the citric and pyrogallic alone, with, of course, a few drops of silver solution. There was, he conceived, a theoretic objection to the use of acetic acid—at least it was a well-known fact that it served to remove the latent image from an undeveloped plate; and even when mixed with the pyrogallic acid it might exert this injurious tendency. In proof of the great liberties that might be taken with the exposure in this process, he on one occasion, in the company of the Chairman, developed two plates exposed under exactly similar circumstances, except that one got two and the other four minutes' exposure. They were both alike good, being dense and vigorous negatives, and he thought Mr. Ramage would bear him out in saying that the time occupied in the development did not much exceed a couple of minutes.

Mr. BURNS said that when Dr. Norris published his experiments relative to the deteriorating action certain substances had on an undeveloped plate, he had repeated the experiment with pyrogallic acid, which, according to Dr. Norris, should have considerably weakened, if not have removed, the impression: instead of this result, he (Mr. Burns) fancied the picture so experimented on was improved by that treatment. Whatever it might be theoretically, practically he had found no removal of the latent picture.

Mr. NICOL: No doubt acetic acid posesses the property of removing the impressed image; but if used in small quantity it does not seem to exert it.

After other remarks, a vote of thanks was awarded to Mr. Slight. It was intimated that a portion of the next meeting should be devoted to examining the pictures taken during the excursion to Roslin, the previous Saturday, with a view of determining which picture was best.

The meeting then separated.

This Society again met on the 18th ult.,—Mr. Slight in the chair.

Mr. Ballantine, George Street, was admitted a member.

On the table was a great variety of views of Hawthornden and Roslin, a considerable number of which were contributed by Mr. Burns, but which, not having been taken on the Saturday of the Society's excursion, were not entered for competition. Those competing were numbered by the Secretary, the members generally not being aware by whom any particular picture had been taken. A due time having been allowed for examination, each member wrote on a slip of paper the number of the picture he considered the best, which slips were deposited in the ballot-box. The scrutineer announced a majority of votes for the picture No. 2; on which the Secretary intimated that this picture had been taken by Mr. Slight (the Chairman). This, and some other views taken by him on the same occasion, Mr. Slight presented to the Society's album, remarking that they had all been taken by the hot water process, as detailed by him at the former meeting.

Resuming the conversation on this subject, Mr. Slight said he had since the previous meeting adopted some modifications in the working of this process. In his former remarks he stated that he dried by artificial heat; but he now found it was a great improvement to allow the plate to dry *spontaneously*, after completing the washing with a little distilled water. He had also found it was better to omit the acetic acid from the developer.

Mr. RAMAGE, in answer to a question put to him about the coagulation of albumen, thought that in this process there was no coagulation of the albumen at all. He had tried numerous experiments with the coagulation of albumen on paper, and he found that not only would hot water not effect that end, but that steam at high pressure failed to do so, the albumen being entirely removed from the surface of the paper; and, if hot water failed to coagulate albumen on paper, he did not see how it could act otherwise in this case.

Mr. TAYLOR said that there were a great many substances which would

coagulate albumen, such as acids and metallic salts, and, in addition to those, he thought most undoubtedly that hot water would do so too: they had daily experience of that in the case of boiled eggs. There was this difference, however, between Mr. Ramage's experiments and the process under consideration, that Mr. Ramage's experiments were tried with desiccated albumen, whereas in this case it was fluid. Once the albumen was dried, he then at once granted the impossibility of coagulating it.

Mr. DAVIES: Does Mr. Taylor mean that after desiccation it cannot be coagulated by any means whatever? for, if so, what effect was produced on it by such salts as nitrate of silver?

Mr. TAYLOR explained that he only alluded to coagulation by hot water.

After some general conversation, the Chairman exhibited a number of negatives he had taken the previous day at Aberdour. These were very fine.

The proceedings were then brought to a close.

CHORLTON PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on the 12th ult.,—W. Griffiths, Esq., Vice-President, in the chair.

The SECRETARY read a circular, which had been received from Dr. Diamond shortly after the commencement of the annual vacation, inviting the attention of photographers generally to the position assigned to photographs and photography in the prospective Exhibition of 1862, and which he (the Secretary) said would require the consideration of the members present, inasmuch as (though rather, but unavoidably, late, in consequence of the will of the members to take summer holidays) it was desirable that the opinion of this Society should be recorded.

Mr. HOOPER then proposed the following resolution:—

"That this Society views with considerable regret the position assigned to photography by Her Majesty's Commissioners in the intended Exhibition of 1862, and joins most cordially in the protest made by the London and other photographic societies against the attempt to retard the progress of an art which, though yet in its infancy, promises, with due encouragement, to occupy at no distant time a position equal in importance to painting and sculpture."

Mr. KNOTT said he had great pleasure in seconding the resolution, after which it was put to the meeting and passed unanimously.

The CHAIRMAN then called upon Mr. WARDLEY to proceed with his paper on *The Taupenot Process*. [See page 339.]

This paper proved to be as interesting as it was instructive, and its value was much enhanced by Mr. Wardley affording the members an opportunity of witnessing his method of preparing and developing a plate. He said that business necessities had prevented him exposing for a negative, as he intended, he had, therefore, been compelled to print a transparent positive; that, however, would fully exhibit what he contemplated, viz., the ease and certainty with which a well-prepared plate could be developed. The picture produced was of the most charming character, soft, vigorous, and full of half-tone, and elicited the admiration of those present.

Mr. WARDLEY also laid on the table a series of paper proofs from collodio-albumen negatives, which fully substantiated the advantages ascribed to this process.

Mr. KNOTT exhibited a number of *carte de visite* portraits, sharp, clear, and artistic, very superior to the majority of pictures of this kind.

Mr. HOOPER handed round to the members a few permanent pictures on glass, burnt in by M. Joubert. These were uncommonly fine—in fact, positive art-treasures.

The discussion on Mr. Wardley's paper was adjourned to next meeting.

After a vote of thanks to the Chairman, the proceedings terminated.

New Books.

The Principles and Practice of Photography Familiarly Explained in a Course of Easy Lessons. By C. JABEZ HUGHES.

SECOND EDITION.

London: C. JABEZ HUGHES, 379, Oxford Street.

IN the ordinary course with a second edition we simply announce the fact of its appearance; but, in the pamphlet before us, sixteen pages of new matter on subjects of passing interest having been added we consider it entitled to something more than a casual reference. It is not many months ago that we had occasion to notify the original publication of this useful little manual, the first edition of which has already disappeared from the publisher's shelves; and it is, we are informed, a matter of no small gratification to its author that many experienced and well-known photographers, from whom he would gladly learn, have thought it not unworthy of their perusal. We may remark, *en passant*, that this is honourable to all parties concerned. Those who know most are always, as a rule, the most ready to learn from anybody who has, or is supposed to have, anything to communicate; and, consequently, we may presume that, while complimenting Mr. Hughes by taking his "easy lessons," those accomplished gentlemen who have done so have at the same time borne unintentional testimony to their own enlightenment. Instead of giving an extract from the new part of the manual here we have, by permission of the author, reproduced his chapter on *Intensifying Processes*, which will be found at page 319.

The other new matter introduced ranges over the subjects of *Instantaneous Photography, Carte de Visite Portraits*, and *Improved Gold-toning Process*. In other respects the book remains the same as before. We thought well of it in its original condition: we think still better of it in its present one.

Notes of the Month.

"TERM-TIME," as it is called by Cantabs and Oxonians, has now commenced, and the sessions of the various photographic societies will probably be more than usually interesting. There will be the prospects and details of the approaching Exhibition of 1862 to occupy attention, and the latter half of the terms will include the Exhibition realised. Let us hope that 1862 will be a goal which will also serve as a point from which to start anew. It will present an opportunity of gathering together all the scattered threads and odd-ends of photographic knowledge from every source into one compact whole, from which we ought to make a fresh and better start. It would be curious to speculate on all the changes and results the forthcoming year will have upon photography. In any case it will mark an epoch in the history of the art and science.

Instantaneous photography is undergoing considerable development, and instantaneous pictures continue to excite as large an amount of interest as has ever been bestowed upon any phase of the photographic art. Those glorious pictures of Wilson opened up to us a new world in photography, and have been followed by other aspirants with but very varying degrees of success. Few but those who have made the essay know the difficulties incidental to instantaneous photography. An occasional picture may be obtained—many have such to show—but to accomplish a whole series with anything like uniformity is somewhat of a herculean task. The second series of twenty-four instantaneous Paris views, published on the 23rd ult. by the London Stereoscopic Company, are by far the best street views yet obtained, and stand quite unrivalled. It used to be a blot on the photographic escutcheon that beautiful as its architectural renderings were, the streets were lifeless and deserted, and the impression conveyed was as that of gazing on a city of the dead. In the views referred to there is a roundness and sharpness united with such a balance of the lights and shadows as we are quite unaccustomed to in such subjects. The pictures, too, are not *quasi*-instantaneous, but *absolutely* so. Here may be seen the porter with his burden—the exquisite taking his morning saunter—the belle just brought to a full stop by a pretty bonnet in a near window. In one is an old gentleman endeavouring to overtake an omnibus; in another an equestrian with uplifted arm about to strike; and, again, a boy in the act of falling. The old gentleman doubtless overtook the omnibus—the lash fell on the unwilling beast—the boy completed his fall; but the act arrested *in transitu* on the sensitive plate is retained and fixed for ever! The vast improvements that have taken place in Paris are brought home to us, and even the memorable hot weather of the past season by the umbrellas still suspended over the heads of many pedestrians. The view *Fontaine St. Michael* (No. 34) is a forcible illustration of the great alterations that have taken place in the student's Quartier Latin; and the *Portes St. Denis and St. Martin*—in the time of the first Napoleon the entrances to the capital, but now its very centre—are redolent of life and bustle. *La Station du Chemin de Fer de Strasbourg* (No. 33) will be familiar to every tourist; and the *Rue Rivoli*, with its elegant arcade, bears but little trace of the sites of the memorable barricades of 1848. But it is in (No. 42), the *Boulevard des Italiens*—the Regent-street of Paris—seen in its noon-tide aspect, that the interest culminates.

"How fast the flitting figures come,
The mild, the fierce, the stony face,
* * * * *
Each where his tasks or pleasures call,
They pass and heed each other not,
These eddies of the stream of life."

There is something of the marvellous in the fact that anything so transitory and fleeting in its nature as a crowded street can, as it were, by the wave of a magician's wand, be thus seized and perpetuated.

His Royal Highness the King of Siam is about to become a practical photographer, and is impatiently awaiting the arrival of a complete set of apparatus manufactured for him by Messrs. Negretti and Zambra, and has, beside, engaged the services of a gentleman to initiate him in the principles and practice of photography. His Majesty will, of course, not object to black his royal fingers, and will probably, shortly, be well up in foggy baths and "depth of focus."

An Exhibition of Works of Industry and Art has been opened at Florence. The gallery devoted to photography is very extensive, and full of pictures; but, according to the correspondent of the *Daily Telegraph*, among so many thousands of photographs there is much "rubbish." As usual, portraits are in excess.

S. T.

HARRISON'S NEW LENS.

Our American correspondent, Mr. C. A. Seely, has reproduced in the *American Journal of Photography*, our report upon the proofs received by us, in evidence of the alleged large angle of 90° field of view included by Harrison's lens, to which he has appended the following comments, which, it will be seen, coincide with remarks in his letter:—

"The above seems to place the correspondent in a somewhat awkward predicament. The photograph from which Mr. Shadbolt pronounces judgment was made by Mr. Harrison himself, and was regarded as a fair test specimen. Now is it true that the lens which we with others have claimed would take an angular field of 90° can do no more than our ordinary instruments?

"We have to say, in view of what has previously been said in this Journal, that we have not seen the lens in question: our information is second-hand: we formed our opinion on the statements of others, in whose integrity we had, and still have, the most implicit confidence.

"We were assured, for example, that the photograph described by Mr. Shadbolt, and which is a little over five inches in diameter, was produced by a lens 2½ inches in focal length, and we discovered nothing in the picture inconsistent with the representation. Could our informant have blundered to the extent of one-third in a very simple measurement? Would he tell a falsehood where every one who should see the camera might detect him?

"Our readers no doubt wonder why we have not, for ourself, tested the lens. We share that wonder.

"The lens was brought before the public at the Photographical Society. A discussion was held and a Committee of examination was appointed. But the Committee did nothing—at first by reason of Mr. Harrison's sickness, and finally by his withdrawal, and nothing further transpired.

"We have taken some pains to see the lens, but with failure. To-day (29th), we called on Mr. Harrison's agent, and was politely informed that the lens was not ready for exhibition, and that no information about it would be given at present.

"There is a good deal of unpleasantness hanging about this matter: we think also we preceive a silght odour of humbug. Whence comes it?

"Before our next we shall blow away some of the fog, and be better prepared to expose how much merit there is in this alleged new lens, and to whom this merit belongs.

"And, notwithstanding the adverse opinion of Mr. Shadbolt, relying on considerations from the construction of the lens, the work produced by it, and the credibility of witnesses, we still adhere to our former belief, that the lens will take in a field of 90°."

Of course the explanation of Mr. Seely's misinformation is now simple enough, and lies entirely in the alleged *focus* of the lens, which is stated to be but two and a-half inches. It is by no means impossible that the plate may have been no greater distance from the *back surface* of the combination. But this has nothing to do with the *equivalent focus*, which, for anything that appears to the contrary, may have been six or seven inches; and, from the scanty description of the construction of the lens which we have received, the focus *must* be *considerably* more than two and a-half inches, assuming the plate to have been located within that distance of the posterior surface of the combination.

Mr. Skaife, the well-known pistolgrapher, last week brought a charge of felony at Brighton against a young man of highly respectable appearance, named William Morgan, formerly a pupil of his. It appeared that Mr. Morgan had articled himself for two years to Mr. Skaife, but had left him and gone to Australia a few months before the expiration of his time. Recently returning from Australia, he commenced business at Brighton, and inserted the following advertisement in the *Brighton Herald*:—

Instantaneous Pistolgrams of Babies, Family Groups, Equestrians, Dogs, &c.—Mr. W. Morgan (late senior pupil of Mr. T. Skaife, patentee) is now taking these beautiful little pictures, at half the original prices, by his newly-improved pistolgraph. Parties attended and pourtrayed at their own residences—Invalids in their own apartments. No extra charge. Or at W. Morgan's, 13, Crescent-place, Marine parade, Brighton, where numbers of specimens are on view daily from 10 a.m. till dusk.

Mr. Skaife immediately went to Brighton, and procured a search-warrant on account of a lens belonging to a pistolgram, which he alleged to have been missed after the prisoner's departure. No lens was found, but fourteen small photographs or pistolgrams, exhibited in Mr. Morgan's show-cases, were claimed by Mr. Skaife as his own property. In defence, the prisoner stated that the plaintiff had given them to him. Two of them were portraits of himself, one that of a young lady (a friend of his), one that of a fellow-pupil, and one of Mr. Skaife himself: the remainder were stated to be waste copies. Mr. Skaife denied this, and also that they were given to him. From the nature of the evidence, the case was transferred to London, where the evidence of other pupils might prove that these pistolgrams were thrown about the room in a careless manner, as alleged. On being brought up at Mary-le-bone police court, Mr. Morgan was discharged, but the pistolgrams were ordered to be given up to Mr. Skaife.

Foreign Correspondence.

Paris, September 26th, 1861.

The season which is about to begin promises to be abundant in new photographic publications. The summer has been long enough and fine enough to enable our photographic tourists to gather in an ample harvest, and now that they are returning very remarkable works are being talked of. Théophile Gauthier, our critic, poet, and *fantaisiste*, who is at present in Russia, has been inspecting the museums, galleries, and public buildings of that interesting country, and has put together his observations and impressions in a book which is about to appear with the title of *Trésors d'Art de la Russie*, and under the patronage of the Emperor Alexander. This handsome work will be illustrated with two hundred large-sized photographs by M. A. Richebourg.

While MM. Ferrier were busily occupied here with their instantaneous stereoscopic pictures, which are so successful, their partner, M. Soulier, was travelling about Sweden, Norway, and Denmark. He has now returned with a collection of views which combine the interest of novelty with those artistic qualities which so eminently characterise all his works.

M. Bisson, who was so successful in the ascent of Mont Blanc, has likewise returned. He is preparing to publish the numerous views with which his recent journey has furnished him. I have already seen some of them, and I can affirm that they are even superior to those which have preceded. Both of the brothers have laboriously worked during the long summer days. While the younger one was climbing the snow-capped mountains or exploring the verdant valleys, the elder one was at home organising their operating-room, from which already quite a collection of excellent portraits has issued.

M. Micheletz has just brought out a numerous series of reproductions of paintings and drawings, of the same size as the card portraits. Thus, at small cost, one may form a little gallery of the principal compositions of our modern painters. The idea, which appears a good one, originated with Disderi, but M. Micheletz deserves the credit of having applied it with intelligence and skill.

I spoke in my last letter of the development of photography in Spain. Already the Trans-Pyrenean artists and their works are being talked of. For instance, there is M. Melendez, who has just made a picture of the moon, far more complete than those hitherto obtained. This he has done by adding to his photographic apparatus a combination of very powerful lenses, which allows him to reproduce the variations of the lunar surface in all their details. "In this beautiful map of our satellite," we are told, "you see mountains and volcanoes, which appear to vomit forth lava. You even distinguish vast petrified forests."

Numerous contrivances have been imagined, both in England and in France, for enabling travelling photographers to dispense with their tent or dark closet. M. de Poilley has just patented a new apparatus of this kind. It consists of four separate sets of apparatus. One is for collodionising the glass mechanically and free from the dust. The second, for nitratising, is a vessel suspended by a handle under the camera, and turning upon its centre, so as to take the positions necessary—first, for the introduction of the plate; second, for its submersion; third, for letting it drip; fourth, for taking it out of the bath and passing it into the frame without any loss of liquid or action from the light. The frame is of the usual form. A vessel for the developing solution completes the apparatus. This vessel is made so as to receive the plate as it leaves the frame after exposure in the camera, without allowing the external light to act upon the sensitive film. The operator can also follow the apparition of the image, wash it, and withdraw it at the right moment. I have not seen this apparatus, and can add nothing to the above description. I am aware that there exists a large number of systems intended to spare artists the encumbrance of tents and dark closets; but, however ingenious these inventions may be, professional men always prefer to use the ordinary instruments, or to operate on dry or on albumenised collodion, when they are travelling. However, portable laboratories and other things of that kind may be useful in certain cases, and have naturally an attraction for amateurs.

Microscopic photographs are quite the fashion. Since the appearance of M. Dagron's photographic jewels, everybody has been trying to make them. A few months ago folks were trying to amplify as much as possible, now they are aiming at the imperceptible. Such is this world! Out of ten letters that I receive, seven at least ask for information as to the processes and instruments required for these productions. Well, it is a fashion: we must not complain. Photography always gains from these manias. They pass away, but they leave their traces behind them.

ERNEST LACAN.

New York, August 30.

I HAVE before me, to-day, THE BRITISH JOURNAL OF PHOTOGRAPHY of the 15th August, in which I find some remarks of the Editor upon the photographs sent by myself to illustrate the working of Harrison's new lens. The remarks seem to demand an explanation from me. I greatly regret that I am unable to put the matter in so clear a light that doubts will be removed.

I have never seen the lens in question. A few only have been made, and none appear to have been submitted to any critical investigation. They have scarcely gone out of the hands of those supposed to be pecuniarily interested in them. Mr. Harrison—one of those ingenious mechanics who work only by the "rule of thumb"—and the others, having only a pecuniary care for the invention, seem not to know how easy it is to determine precisely its value. For example, I suppose it has not occurred to them to place the camera in a corner of a room, and see if it will take in the adjacent sides, or how nearly it will do it.

The lens was first introduced to the public by authority of Mr. Harrison, at our Society. A Committee of examination was appointed, but accomplished nothing—at first by reason of Mr. Harrison's illness, and, finally, by reason of his refusal to act.

My knowledge of the working of the lens is, therefore, mostly second-hand or theoretical. I was told by those on whom I relied that the lens would take in an angular field of ninety degrees, and, as illustrations, the photographs examined by Mr. Shadbolt were offered. To my judgment—complaisant perhaps—the photographs were not inconsistent with the claim. There were also theoretical considerations, in part given in a former letter, and the fact that Mr. Wolcot, an American optician, nearly twenty years ago, had invented the same construction under the name of a "ninety degrees' camera," all favouring the pretensions set up. And I have now to add the well-founded statement, that a gentleman well-skilled in the science of optics, working wholly independent of information from Mr. Harrison and Mr. Wolcot, had arrived at the same construction of a lens designed for the same purpose.

For myself, I have so little of the mathematical talent that I would much prefer to test a lens by the actual trial, and will hold myself ready for a change of opinion through the persuasion of Mr. Shadbolt or any other competent force.

Since the receipt of THE BRITISH JOURNAL OF PHOTOGRAPHY of the 15th of August, I have asked, in view of this letter, to be permitted to see the lens; but the request was declined. I shall, however, within a few days, have full and accurate information from sources wholly independent of the caprices of the men of business.

You may soon expect to hear that the dry processes have become a hobby in America. Photographers have been utterly indifferent to them hitherto, for the reason that they were not satisfied that dry collodion could produce first-class negatives, But some recent brilliant successes of one of our amateurs with the tannin process have brought conviction home to the most sceptical.

I have recently been making some chemical investigations which have turned up some facts which may be of interest to photography. For example:—A nitro-dextrine having many of the properties of gun-cotton may be made: it dissolves only in a *mixture* of alcohol and ether. Gun-cotton is soluble in nitro-napthaline: the bromine and iodine of collodion gradually pass into a combination which will not precipitate silver.

I propose, shortly, to endeavour to find out the conditions of collodion required for sensitiveness and intensity.

CHARLES A. SEELY.

[The above letter was received too late for insertion in our last number.—ED.]

New York, September 14*th*, 1861.

OUR Photographical Society came together, after its summer vacation, on the evening of the 9th inst. The attendance was not large; but the proceedings had a good degree of earnestness. The members seemed to make a vow that the Society should go on, any how. In future our meetings are to be graced with the presence of ladies: we agreed to tender them a special invitation.

The most important events which had transpired in the photographic world, during the vacation, were reported, and furnished the starting of a discussion which nearly exhausted the evening.

Apropos of Professor Balsamo's phosphorus process, President Draper remarked that he once made a study of the photographic properties of phosphorus. He found that yellow phosphorus, on exposure to light, was changed to red phosphorus (was transformed into a new substance!). He formed layers, by melting, of phosphorus between two sheets of glass. He succeeded on this surface in photographing the fixed lines of the spectrum, and in making prints from negatives. Some of the prints he had preserved, in the dark, six or eight years. Phosphorus in solution in ether or oil is precipitated on exposure to light.

Phosphorus needs further looking after as a photographic agent. It may furnish a new solution to the problem of photo-sculpture, or photo-etching. For example: let a sheet of phosphorus be exposed under a negative, and the print be developed and "filed" by dissolving away the unlighted parts. Phosphorus is not an agreeable material to handle, or for a work of art; but the artistic form may readily be reproduced in other plastic substances or metals.

The case of Photography *versus* Royal Commissioners was also pretty fully gone over at the meeting. It seemed to be agreed that the Commissioners had made a bad "fist" at scientific classification, and that they were tainted with the "high-art" snobbery. Some of our members also make it a special praise to our art that it is useful, and think it well competent to bestow as much glory on the so-called fine arts as it can receive from them.

When photographers become artists, then, in my opinion, photography will everywhere be considered the highest and noblest of the fine arts.

CHARLES A. SEELY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

COLLODIO-ALBUMEN.

To the EDITOR.

SIR,—Would you oblige by assisting me in the following difficulty that I have met with in the collodio-albumen process:—

After the hypo. is removed, and the washing is commenced, the film begins to shrink up in ridges, *tree-shaped*, and increase to such a size that they do not recede on drying, thus spoiling the negative.

I tried with a much weaker hypo., and removed it immediately: all the iodide was out, but still the result was the same.

In preparing the plates (9 by 7) I bake them well. I have developed scores (by pyrogallic acid), but never met with this evil before. I have tried washing quietly at first, but with no better result. Perhaps you can refer me to some previous notice on the above in your useful Journal.

2. In using ———'s collodion, with cadmium iodiser, I cannot get a picture free from fog; while, at the same time, other collodions give perfect results. Can you advise me on that also?—I am, yours, &c.,

DRY PLATE.

September, 26*th*, 1861.

[It is most likely the *acetic acid* used with the pyrogallic developer that has the effect of loosening the film: it is not the hyposulphite of soda which does the mischief. Try your developer with less acetic acid. The collodion should also be allowed to "set" well before immersion in the nitrate bath.

2. You must have a slightly acid bath for the collodion you indicate; or, if you use it for dry plates, you may add to it just enough *tincture of iodine* to make the collodion a bright straw colour, when you will find the fogging propensity cured.—ED.]

MODIFIED TAUPENOT PROCESS.

To the EDITOR.

SIR,—A letter in your last number, headed "Dry-plate Difficulties," is answered by a recommendation to procure Major Russell's book on the tannin process.

I have great respect for that accomplished amateur, and have also, Mr. Editor, great respect for your advice; but, nevertheless, if you will allow me, I would recommend your correspondent "Watkin," if he wants satisfactory plates, to prepare them by what is known as Major Russell's modification of the Taupenôt process, and *not* by the tannin process. It cannot be denied that the latter produces clean, bright, and beautiful pictures; but neither can it be denied that it is extremely slow, and that, from the condition of the film, you can never rely upon finishing your picture without a mishap. The very contrary may be confidently asserted of the modified Taupenôt process, which I proceed to describe.

Coat with a powdery bromo-iodised collodion (Hughes's, Ackland's, or Keene's answer well). Sensitise in ordinary negative bath. Wash in a dish of distilled water till greasiness disappears. Cover the plate with as much water as it will hold, wave backwards and forwards as you would your developer for a few seconds, and then pour off. Repeat this

operation ten times. (There is no better way of washing than this: you may even clear a half-plate of hypo. by it with a few ounces of water.) Now drain, and cover with iodised albumen (see formula below). Keep the plate level for half a minute; drain; let it stand up to dry for a quarter of an hour; then finish before a fire, or against a vessel full of hot water. (The plates may be prepared thus far in strong sunshine with perfect impunity.) Now immerse in aceto-nitrate bath (thirty grains of nitrate of silver and thirty minims of glacial acetic acid to each ounce of water) for a minute. Wash till greasiness disappears. Cover the plate with a five-grain solution of chloride of ammonium, let it rest twenty seconds, wash freely under a tap or from a jug, and finish with a two-grain solution of gallic acid. Dry spontaneously.

The albumen is prepared thus:—To the whites of six eggs add eighteen drops of glacial acetic acid in half-an-ounce of distilled water; stir with glass rod for two minutes, let stand two hours, then filter through paper; add sixty minims liquor ammoniæ, and label it "Prepared Albumen." It will keep for months, and is available for all albumen processes. I am indebted to Mr. Ackland for this formula, and a most excellent one it is. For the Taupenôt, add to each ounce five grains of iodide of ammonium, one grain of bromide of ammonium, two grains of chloride of ammonium, and filter just before use.

The exposure should be about six times that of wet collodion; or about *twice*, if the development be aided by heat.

In the former case wet the surface thoroughly with distilled water; then develop with pyrogallic acid two grains, glacial acetic acid 30 minims, water one ounce, ten-grain solution nitrate of silver three or four drops (add no more silver unless it be absolutely necessary). After short exposure pour over the plate a large quantity of very hot water, apply the same developer, keep it on till it is muddy or ceases to act, then wash and warm as before, and pour on new developer, altering the relative quantity of pyrogallic acid and silver according as the plate is wanting in detail, or presents the thin, feeble appearance of over-exposure. In sunlight, two or three seconds' exposure will often suffice, if this mode of development be used.

Some of the advantages of this modification are great keeping qualities, very quick development, perfect freedom from stains, as well as from any sediment during development, and a film which sticks to the glass as though it were part of it.

The preparation of the plates is not tedious, however that may appear to be the case from the description, and requires but ordinary care to ensure uniformly excellent results. Really, the unsuccessful dry photographer who does not give it a fair trial is deserving of no compassion.

I am, yours, &c. A CLERICAL AMATEUR.

[Our correspondent, "Watkin," did not seek our advice about a process; but having adopted one, and found some difficulties therein, made inquiries about how he could avoid them: hence our reply. Amongst the specimens with which "A Clerical Amateur" has kindly favoured us, that by the tannin process is, in our judgment, decidedly the best of the whole of the stereographs, though we do not think it surpasses the larger picture—which we perceive, by the label attached, was taken with the front part of a Jamin's quarter-plate lens, upon a plate kept for ten weeks, fully prepared by the modified Taupenot process above given, and with an exposure of three minutes, against one of five minutes for the stereoscopic-sized tannin plate. In all of the smaller pictures, where there is any foliage, there are evident indications of under-exposure, although the buildings, &c., are fully brought out; but in the larger specimen the foliage, though still a little too heavy, is well indicated. It is not a little singular that we adopted an albumen solution, some months back, very closely allied to that suggested by Mr. Ackland, the object aimed at being the attainment of great fluidity in the albumen. This we brought about by the addition of *citric* acid to the albumen (from a hint thrown out by Mr. Hardwich), and, after allowing it to stand all night, we neutralised with liquor ammoniæ, and then added a surplus of about ten minims of the ammonia to each ounce of fluid. This we found to filter readily through ordinary filtering paper.—Ed.]

BATH DOCTORING.

To the Editor.

Sir,—I have a twelve-by-ten bath, full of strong nitrate of silver solution, which has been used for the resin process, and contains about twenty to twenty-five drops of acetic acid to the ounce. I am anxious to adopt the tannin process, but fear the acid bath will be detrimental. How am I to proceed to destroy the acidity without injurying the purity of the bath? I fear that if I add carbonate of soda or other alkali to neutralise it that I shall spoil it by forming acetate of silver in the bath. If you will give me proper instructions how to proceed in your next number of The British Journal of Photography, I shall be greatly obliged.—I am, yours, &c., XERXES.

Leicester, September 16th, 1861.

[Add carbonate of soda in excess, so as to throw down all the silver in the form of carbonate of silver, which will produce a white precipitate. When no more can be thrown down pour off the liquid and wash the deposit two or three times in distilled water; then add dilute *nitric* acid, which will dissolve the carbonate of silver with effervescence, and when all is dissolved make up the quantity required with distilled water.—Ed.]

CLEANING THE PLATES FOR THE TANNIN PROCESS.

To the Editor.

Sir,—Having been absent from England I did not see Mr. Dawson's letter on my method of cleaning glasses until a few days ago. The objection to allowing the plates to drain dry after being washed in hard water, would be well founded if they were intended to be merely dry rubbed before use. In my way of working, the washing is only to remove grit or old films; the subsequent cleaning with the old collodion mixture, in my own experience, immediately and entirely removes all deposit formed by the drying of hard water. It is possible, however, that some kinds of water may leave a residue not so easily removed, which may make it necessary to wipe the glasses dry after washing.—I am, yours, &c. C. RUSSELL.

London, September 25, 1861.

WHO INVENTED OR DISCOVERED THE MALT PROCESS?

To the Editor.

Sir,—Allow me to reply to Dr. Paterson's letter of the 27th of August. And, first of all, let me say that I highly respect this gentleman for the pluck he has displayed in defending a Society which, in my opinion, has much need of a few more men among them like Dr. Paterson, who in his defence has, undoubtedly, made the very best of a bad cause. I now make a remark or two on it. The Doctor thinks that in the chemistry of worts my knowledge is sadly deficient, and he is quite right; it *is* very deficient. But what in the name of all that is photographic has a knowledge of chemistry to do with the matter? *Who invented or discovered the malt process?* That is the question. At the risk of boring your readers, I must again reply as I have formerly done. In 1855, a London gentleman, "I. J. H.," published "sweet wort" as a preservative; and in 1860 Mr. John McNair published "common brewer's wort" for the same purpose, and got a medal for the *discovery*. In the names employed to designate this *malt infusion* I have employed the language of these gentlemen themselves; and Dr. Paterson (or any one else) is at perfect liberty to prove that the two substances are entirely different chemically—only there are few who will be willing to admit any difference. In dismissing this worthless process, I trust for ever, I would say to photographers, "avoid using 'malt solutions' in your photographic practice; but, if used at all, let it be *after* your last plate is developed, when, properly prepared, and used in moderation, it may possibly serve to preserve—not your plates—but your spirits."

Respecting the very strong aceto-nitrate bath, and the washings in a stated quantity of water in the Doctor's own process, is he not aware that from 50 to 100 grains to the ounce have *often* been employed and published? In (I think) the second number of the London Society's Journal the supposed virtue of this is alluded to. This is now exploded, however. The washings in a given quantity of water were published in connexion with Fothergill's experiments nearly a year before the Doctor published his process. Granting my own ignorance of chemistry, I might turn the tables on the Doctor, and ask if *his* chemical knowledge is not somewhat at fault in supposing that 40 grains of silver to the ounce of water effects the decomposition of the iodide in the collodion any more perfectly than 35 or 30?

If he consults his table of equivalents I suspect he will find that he is indeed dosing it rather strong; and I have been at the trouble of trying it with the maximum as well as the minimum strength here mentioned, and find *no difference* in the result.

Another perusal of the former letters of Dr. Paterson, as well as that of Mr. Taylor, shows me that I have left some minor topics without a reply; but they are only unimportant, and scarcely merit consideration.

The Doctor objects to my name. Well, I grant it is indeed a very common-place, unscientific name, totally devoid of grace or poetry; and with regard to his logic—that because *he* does not know such a person, therefore no such person can exist—I doubt not it must have called forth many a smile from your readers, as well as from

Cornwall, Sept. 23, 1861. P. SMITH.

BINOCULAR LUSTRE.

To the Editor.

Sir,—Being much interested with the varied phenomena of the stereoscope since its application to photography, and having now read the paper by Sir David Brewster *On Binocular Lustre*, I feel inclined to trespass on your columns with a few observations on this interesting subject. Not having had the opportunity of seeing the effects of any two mathematical solids—the one drawn on a white, the other on a dark ground—I can only imagine the appearance such a combination might produce. Sir David Brewster's explanation appears a reasonable one; yet I have my doubts. My attention was early drawn to the most perfect deception conveyed to the brain by a stereograph of looking glasses, glass globes or shades, highly-polished furniture, and all other reflecting surfaces, including windows. To look at only one of the pictures, the "high lights," or "lustre," appear only as white patches; but when the two pictures are combined in the stereoscope, these white patches, as if by magic, become really bright and shining centres. A glass globe, or a soap bubble, or a highly-polished piece of furniture, appear to be really such, nor can the mind by any effort undeceive itself.

I have adopted, from the first binocular daguerreotype I produced, in which were some polished shells, my own explanation of the phenomenon, but would not even now intrude it on your valuable space did there not appear some confusion in the explanations given by the several writers who have treated this subject.

As the "high lights" of all reflecting bodies are the images, more or less perfect, according to the form or quality of the reflecting surface, of the source of light, whether it be the sun, a lamp, or a skylight or window, it will therefore depend upon the situation of the eye upon what part of the reflecting body the high light will be seen: the image will move along the surface of the body as the eye moves. As a necessary result each eye must see this reflection on different parts of the object; and, if the reflecting surface be an ordinary looking-glass, the objects in that looking-glass come under the laws of binocular vision, and appear at certain distances as the eyes alter their convergency. In the soap bubble we have the same laws at work. We have the diffused light of the bubble copied, and the concentrated lights from its convex and concave surfaces; and, as these concentrated lights appear in a different place to each eye, as objects do in a looking-glass, the eyes have to alter their convergence when looking at them in the stereoscope—consequently, while the mind appears to look at a sphere, it is at the same time under the impression that this sphere is a transparent glass or water one, inasmuch as the eyes have to alter their convergence when looking at their concave and convex reflections, neither of which reflections appear on the *surfaces* of the spheres. As the mind is thus subject to the external senses for its real or unreal impressions, it has the idea conveyed to it by the two eyes and two pictures, as if it were looking at a real bubble.

The same laws will explain why furniture appears to shine or possess "lustre," and why a bronze figure appears really as such. The polished wood possesses an endless variety of reflecting surfaces on very imperfect mirrors, the concentrated or "high lights" of which do not appear on the same spot to each eye, consequently the eyes have *unconsciously* to alter their convergence in looking at the high lights from looking at the surface of the furniture. And as some bronze figures possess so little of the prismatic colours, a stereograph of it must give the brain the impression of bronze. The other metals can be equally imitated, but the stereograph will require great precision in the artist to colour the two pictures exactly alike.—I am, yours, &c., E. JONES.

Holywell, Sept. 21st, 1861.

[Our correspondent's views are perfectly sound, so far as they go. We shall probably in our next make some further remarks on this subject.—Ed.]

MICROMETRY.

To the Editor.

Sir,—I feel greatly obliged by your courtesy in having sent me a copy of your paper on micrometry. It is a very pleasing paper on an interesting subject. Although I quite agree with you that photography is not likely to supersede mechanical means in the production of micrometers, still my trials, instigated by necessity, to supply quickly a rough and ready measure for very minute microscopic substances, quite answered my requirements; and I think a micrometer much finer than that I produced—mine having divisions $\frac{1}{1000}$th of an inch in breadth—might be made by photographic means.

I did not think the matter worth publishing until I saw the photographers in America were working at the same subject, and that they seemed to imagine divisions $\frac{1}{100}$th of an inch (I believe that was the reputed breadth) were remarkable ones to obtain. As I had easily produced sharp lines $\frac{1}{1000}$th of an inch broad, and had used them successfully as a micrometer, I thought it might be well to direct attention to the fact, in case others might wish to pursue it further.

I had not noticed, before I received your paper, Mr. Maltwood's finder: however, although the idea of the *photographic micrometer* occurred to me as an original one, of course I do not dispute the right of any person who lays claim to it.—I am, yours, &c., THOMAS WOODS, M.D.

September 12th, 1861.

CAMERA CAMPESTRA.

To the Editor.

Sir.—In the remarks of "Eye-witness" upon the Photographic Exhibition of the British Association, the views taken with my Camera Campestra are described as by Mr. Albin. May I beg to be allowed to correct what is, I presume, a typographical error,—the views referred to having been taken and exhibited by yours truly, C. ALFIERI.

Northwood, Hanley, Staffordshire,
September 21st, 1861.

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

ANSWERS TO CORRESPONDENTS.

ERRATA.

In consequence of an accident a packet of *corrected proofs* did not reach our printer until the day after we "went to press" with the last number. Several annoying errors therefore appeared; but as some were evidently typical, and such as every one could correct if he noticed them, it is needless to make special allusion thereto. We must however beg our readers to correct the following, viz.:—

Page 326, column 1, line 6, for "cyraphite" *read* "graphite."
" " " 61, for "luminated" *read* "laminated."
" " " 70, for "conveyance" *read* "convergence."

Page 334, column 1, the following comment after the letter signed "Verdant Green" was altogether omitted, viz.:—

"The addition of spirit to your albumen solution is quite inapplicable, as it would immediately coagulate the albumen; but you may, if you please, in order to avoid the use of the glass rod or sponge, coat your plates after first wetting them by immersion in distilled water, and draining pretty closely—*not* drying them."

There were also several corrections in Mr. Wall's paper that should have been made, but the omission does not render it unintelligible.

A. V.—Already answered.

C. Lamb.—No! On the contrary it retards the action.

Lynx-Eyed.—Thanks for the offer; but it is not suitable.

P. S.—The interest of the subject has long since passed away.

Ambrose,—Yes! Gutta-percha will do very well for the purpose.

T. H. S. (Bath).—The subjects named have been frequently photographed.

Philo Photo.—We condemn in toto anything approaching to coercion in the matter.

Cambria.—We have little doubt that Mr. Gulliver, of Swansea, would give you the necessary instruction.

Photo-philo.—We cannot give you any practical instructions in the daguerreotype process: it is almost extinct.

Abraham.—Mr. Hockin is in the habit of sending collodion out for exportation in hermetically-sealed glass tubes.

O. C.—You have most likely added too much alcohol to your developer: make a fresh quantity without any, and mix the two.

W. E. I. (Back Creek, Amherst, Victoria).—The value of a One Pound Note of the Union Bank or the Bank of Australia in Liverpool is 18s.

Portsmouth Boy.—There is no novelty, and, we may add, no advantage in the use of sea water for salting your paper, in preference to a definite solution of pure chloride of sodium, barium, or ammonium.

A. L.—We cannot undertake to test lenses for any correspondent. Whenever we test a lens, by request of the maker, it is for the purpose of publishing the result of our examination, whether favourable or not.

Pyro.—1. An "instantaneous" process is merely one in which all the chemicals are nicely balanced one against the other. See Hardwich's *Manual*, and also The British Journal of Photography *Almanac* for 1861.—2. Yes, if they will bear much aperture, and your light is very good.

J. H. S. (Birmingham.)—The stain upon your plate is, we believe, oxide of silver, and no doubt arises from the condition of your bath, which is probably surcharged with ether and alcohol. Expose it to light in a shallow dish—then filter carefully—and, before returning it to the bath receptacle, wash out the latter carefully with solution of cyanide of potassium, then with water, and lastly with distilled water.

Cantab.—We have some difficulty in advising you about the size of pictures to adopt without knowing more of your own desires and objects in view. Personally we do not like very large ones. Ten by eight, or at most twelve by ten, inches would be suitable to our ideas; but, if you require them for wall decoration, you may prefer larger specimens. Large pictures are never so satisfactory for amateurs to work upon, as they entail too much hard labour without an assistant.

J. H. S. (Birmingham).—Your are in error relative to the Journal which you quote. Mr. Barber's paper appeared in this Journal, Volume VIII., page 159. It was read at the North London Photographic Association. To decolourise your paper sensitising bath you can, under the circumstances which you mention, add liquid ammonia, stirring well after each addition, until a brownish grey precipitate in small quantity is formed: the ammonia will neutralise the acetic acid, and then throw down a little oxide of silver. When the precipitate begins to appear, expose the solution to the sunlight, when the organic matter will unite with the oxide, and leave the solution clear by subsidence. You can then filter and re-acidify if you think fit.

W. Wilson.—1. Re-wash your pyroxyline, using about an ounce of ammonia to a gallon of water for the first wash, then several changes of plain water, letting the cotton absorb the water, and squeezing it out again several times. You will not do any good by attempting to repair the collodion made with the acid pyroxyline, and had better use it up for cleaning your plates with; for which purpose add to it about a salt-spoon full of carbonate of soda, and shake all up together.—2. You cannot do better then follow Mr. Barber's directions for restoring your bath.—3. See The British Journal of Photography *Almanac*, page 28.—4. Chloroform is of no use for neutralising acid collodion.—5. Your friend can use either of the following numbers on your list, viz, 1, 8, 9—the two first preferable.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 152, Vol. VIII.—OCTOBER 15, 1861.

Restoration of Sensitiveness.—In a paper *On the Taupôt Process*, by Mr. Wardley, which appeared in our last ıpression, we find at page 340 the following observations, z.:—"A ray of white light falling upon a sensitive collodion ate cannot be obliterated by an after application of an iodide ɔlution, or even iodised albumen." The observation was in ference to the presumed impunity with which collodio-albumen lates might be prepared in ordinary daylight prior to their nal sensitisation.

That an *iodide* will not restore the normal condition of a late that has received an actinic impression where anything ɔproaching to reduction has taken place we are quite prepared believe; but we are somewhat surprised to learn that Mr. Wardley has arrived at the conclusion that no actinic impreson can be removed by an iodide, and this from direct experiment ɔon a sensitive collodionised plate. We shall have much pleaıre in publishing a detailed account of his experiments if he ill afford us the means of so doing. That an actinic impreson can be removed from a sensitive collodionised film we have ɔt a shadow of a doubt; and, what is still more important, it ın be removed from a sensitised collodio-albumenised plate, as e have proved by direct experiment. But this is to be accomished, not by an iodide, but by iodine. If a sensitive plate at has been exposed to light be soaked for a short space of ne in water containing a few drops of tincture of iodine, and ıen drained, washed, and dried, it will be found to have reıined its former capability of receiving an impression in the ımera. Of this we are certain; but whether it receives an ıually vivid impression in the same space of time for exposure e are not prepared to decide. One thing must be noted as of ıportance to success in this experiment, namely, that the dised water shall not have been entirely decolourised, which is ı indication that the amount of tincture of iodine added has ɔt been quite sufficient: in that case the plate should be again aked in a fresh quantity of water prepared as before.

Prima facie we should have expected that, if the collodionised nsitive plate were free from albumen or other organic matter of similar nature, an actinic impression would have been remove-le by an iodide; but, that if any organic matter like that above dicated were present, although we should not have absolutely pected a restoration of the sensitive condition where the iodine plied was in combination with some base, we should not have en surprised had it proved to be the case, the affinity of dine for silver being so very strong that an insoluble salt of ver in contact with iodine always becomes converted into an lide. The presence of organic matter, however, so frequently ally alters previously existing affinities that we ought scarcely feel surprise at any abnormal phenomenon which might re-lt from its introduction. It happens appropriately enough at in another column of our last number an observation is corded bearing somewhat upon this same question, though not rectly identical therewith. At page 349 we find that in the port of a discussion at the Edinburgh Photographic Society ɔn the hot-water process, Mr. J. T. Taylor is represented to ve said:—"There was, he conceived, a theoretic objection to the use of acetic acid—at least it was a well-known fact that it served to remove the latent image from an undeveloped plate; and even when mixed with the pyrogallic acid it might have this tendency." Owing to the impromptu nature of a debate it frequently happens that a speaker gives utterance to an opinion that he would scarcely be inclined to endorse on careful reconsideration of the subject, and we fancy that this is one of those occasions. A great and overwhelming excess of acetic when mixed with pyrogallic acid would no doubt restrain the appearance of an image, or even prevent it altogether until more of the reducing agent should be added; but we do not apprehend that it would remove it altogether. No doubt, also, Mr. Taylor did not at the moment call to mind the fact that the removal of the latent image by means of acetic acid was noticed in connexion with Dr. Hill Norris's prepared plates, respecting which it must not be forgotten that the preservative agent is gelatine, and that it is not applied until after the free nitrate of silver has been as thoroughly removed from the film as it is possible by mere washing to remove it: so that too small a quantity, at any rate, would remain to unite with the gelatine to form with it an organic compound, even were it not also notorious that a union with that substance does not very readily occur, but requires some time for its accomplishment. In the hot water process, on the contrary, as detailed by Mr. Slight, the chemical combination between the albumen and the nitrate of silver cannot fail to take place. And here we have a compound capable of reduction by the mere action of light, if continued sufficiently long, without the aid of any developer; and no doubt this reduction is brought about (possibly to an infinitessimal extent only) by the short exposure in the camera. It will therefore be at once perceived why it is probable—we do not say certain—that the so-called latent image upon such a plate would not be removed by the action of acetic acid alone. It is not in any spirit of contradiction that we make these observations; but we deem it absolutely necessary to keep a vigilant eye upon all that is put forth in connexion with our art, in order to separate carefully *opinions* from *ascertained facts*, or soon our landmarks would be removed, and we should become mere wanderers in the field of photographic science.

PHOTOGRAPHIC CONTRIBUTIONS TO ART.

"THE LADY OF SHALOTT."

When poetry and music are wedded together, they not only mutually enhance each other's charms, but give birth to new beauties not possessed by either alone. With poetry and painting no such very intimate union can exist, but each can aid in illustrating the other—perhaps because they speak in different though similar languages, each appealing more particularly to the fancy by means of the ideal—the one through the ear, the other through the eye.

Of all the ambitious attempts made by photographers, perhaps those may be reckoned the most so where they have sought by aid of the camera to do what the pencil has hitherto done in presenting to the eye a translation of the poet's ideas into visible forms. In this branch of our art the difficulties are

certainly increased when the illustrator selects for his subject anything that is not pretty generally known; and, though perhaps it would be wrong to assert that Tennyson's works come under this category, we fancy that with the majority even of the reading public a portion only of his poems can be reckoned as being "familiar in their mouths as household words." We have been led to these reflections from a critical examination of one of the pictures recently exhibited at Manchester by Mr. Henry P. Robinson, of Leamington, a gentleman whose merits as an art-photographer have long been recognised. Our worthy coadjutor and eye-witness at Manchester appears to have held this picture in lower estimation than we are inclined to do, and we cannot help fancying that this arises in some measure from his not having been familiar with the poem of "The Lady of Shalott"—a condition which we personally shared to the extent of not knowing anything about it whatever until, not finding a satisfactory explanation of several peculiarities in the picture in question amongst the few verses quoted in illustration, we had recourse to the poem itself; and it was not until we had read it entirely through that we became thoroughly alive to the drift of the artist's ideas in his method of dealing with so difficult a theme. He may well exclaim with the poet—"'Tis not in mortals to command success; but we'll do more, Sempronius! we'll *deserve* it!" And truly we think Mr. Robinson has deserved it, though we admit that his success is but a partial one.

The following is the descriptive extract from "The Lady of Shalott:"—

"Down she came, and found a boat,
Beneath a willow, left afloat,
And round about the prow she wrote
'The Lady of Shalott!'

"And down the river's dim expanse—
Like some bold seer in a trance,
Seeing all his own mischance—
With a glassy countenance
Did she look to Camelot.

"And at the closing of the day
She loosed the chain, and down she lay;
The broad stream bore her far away,
The Lady of Shalott.

"Lying, robed in snowy white
That loosely flew to left and right—
The leaves upon her falling light—
Through the noises of the night
She floated down to Camelot;

"And as the boat-head wound along
The willowy hills and fields among,
They heard her sing, in her last song,
'The Lady of Shalott.,"

Tennyson.

This extract is appended to the picture; but in order to make it understood we think something more is needed.

Embowered by "four grey walls and four grey towers," on a solitary island in the river which flows down to Camelot, there lives a mysterious lady, whose sole occupation is that of weaving, night and day, a magic web representing the shadows of the world, which appear to her in a mirror constantly before her. Moreover—

"She has heard a whisper say
A curse is on her if she stay
To look down to Camelot."

Does there exist a woman who under such circumstances would *not* look down to Camelot? Of course not. And accordingly, when "bold Sir Launcelot" came riding by, leaving web and loom "she look'd down to Camelot," and immediately—

"Out flew the web and floated wide,
The mirror crack'd from side to side;
'The curse is come upon me,' cried
The Lady of Shalott!"

Impressed with the conviction that her end has come, she makes no attempt to avert her expected doom; but, quietly accepting it, makes the boat her funeral bier, and, singing her own dirge while "floating down to Camelot," expires ere she reaches "the first house by the water side."

That there is something fragmentary, obscure, mystical, and gloomy in the preceding we presume no one will question; and it appears to us that it is to these points in particular that Mr. Robinson has directed our attention. The gloom of twilight on the river overshadowed by the willows, backed by the sloping "fields of barley and of rye," is rendered to perfection—the more so that the sky itself, not visible, is reflected from the water's surface.

Candidly we must allow we do not like the boat, which is not a boat but a *punt*. Its form is too angular for elegance of composition; and, though the idea of elegance is not included in the poem, yet assuredly that of inelegance is still less so.

Again: there is certainly an absence of apparent motion in the boat; but we demur to the objection made by a contemporary, that "a boat gliding, however gently, down a stream would, in dividing the water, cause slight eddying wavelets," because a boat simply carried down by the stream does *not* divide the water, and there is consequently no ripple from that cause—a fact for which we can vouch, having too often witnessed the phenomenon to have any doubt about it. The leaves of the lily, &c., being fixed, while the stream is gliding by them, would cause a ripple, but not so the boat.

Mr. Robinson has departed somewhat from the strict letter of the description for the sake of artistic harmony of composition, and in so doing we presume he has only exercised a discretionary license; but we do not see why it was necessary to make the lady lie down with her head towards the stern of the boat—an unlikely proceeding, as, after entering the boat and "casting off," she would have had to turn round to do so. Neither was it necessary to make her float feet forward, if that was the object in view; for when a boat floats down the stream it does so just as readily stern forward as in the opposite manner. Lastly, by way of objection, we notice a few hard outlines, which we feel convinced Mr. Robinson could have avoided. There are also some minor shortcomings; but, in spite of them all, a work bearing the stamp of artistic talent has been produced, and one which also bears evidence that its author needs but a little more "thinking out" of some of the minor details of his composition in order to enable him to place before the public a work that shall defy adverse criticism. We sincerely trust that he will long persevere in the course which he has so worthily entered upon.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

PYROGALLIC ACID.

Synonymes.—Sublimed gallic acid.
Composition.—$C_{12}\ H_6\ O_6$.
Equivalent.—126.
Preparation.—If gallic acid be heated to a temperature not exceeding 420° F. (215° C) or thereabouts, it is converted into carbonic acid gas and a solid white crystalline product, the acid, the history of which we are now about to consider. This brief statement includes the main fact in reference to the preparation of this substance; but there are various ways of arriving at a satisfactory result, some details of which will doubtless be interesting, not only to those photographers who may be sometimes necessitated to make their own chemicals, but also to those more fortunately situated. It may perhaps be not altogether inappropriate to state that the word "fortunately" is here employed under the conviction that it is more advantageous to be *able* to *purchase* than to be *obliged* to *make* one's chemicals, at least in the majority of cases; and though it may be convenient to know how to supply a deficiency when occasion requires, yet it seldom happens that preparations of the kind now under consideration can be made as economically, on the small scale and with inefficient means, as by manufacturers, who are furnished with every appliance.

When gallic acid is employed as the source of pyrogallic acid, and the process is conducted by cautiously heating the material in a half-filled retort placed in an oil-bath, it is found that 100 parts of gallic acid yield 11·7 parts pyrogallic acid. When powdered gall nuts are used for the manufacture of this acid, the

yield is of course much smaller in proportion to the bulk of material operated on, and is also more likely to be contaminated with empyreumatic products. The following simple, yet efficient, process yields the largest per centage and the best product:—Prepare a cold infusion by macerating finely-powdered gall nuts in cold water during two or three days; strain the mixture at the end of this time through a linen filter; and having by this means obtained a clear liquor, evaporate the same to the consistence of an extract, which should be so dry in this instance as to admit (after it has cooled) of its being reduced to powder. A cast-iron pan should then be procured, about three or four inches deep, and of such a shape in other respects as to fit an ordinary chip hat-box quite tightly. The dry and finely-powdered extract, obtained by evaporating the cold infusion before described, should now be uniformly spread to the depth of half-an-inch over the bottom of the cast-iron pan, a sheet of white filtering paper, pierced with pin-holes, tied over it, and the whole surmounted by the hat-box, band-box, or paper cap, with which the operator may have supplied himself. The whole arrangement is now ready for the application of heat, which is by far the most critical operation in the manufacture of this substance; for whereas it has been found that the process now described yields, when properly conducted, rather more than 50 per cent. of colourless acid, and about 40 per cent. of slightly coloured laminæ and needles, yet, if the heat be incautiously applied, the yield of pyrogallic acid is reduced one-half. It will be found, on removing the paper cap or hat-box, that the filtering paper has absorbed the greater portion of the empyreumatic oil: it will therefore be advisable, in re-subliming the coloured portion of the crystals, to renew the filtering paper, in order that the empyreumatic products may be more completely absorbed.

Properties.—This substance, which, strictly speaking, is not an acid, occurs, when freshly prepared, in brilliant crystalline laminæ, or plates and needles, of the most perfect whiteness. It is permanent in the air when dry, and in this condition does not redden litmus paper. It is a powerful de-oxidising agent, reducing especially all the oxides of the noble metals, and hence its application in photography as a developing agent. It is completely soluble in alcohol, ether, and water. Its solution in the latter menstruum blackens on exposure to air, and deposits a brown powder. When suddenly heated in the air, it burns with a red flame, leaving no residue of carbon. It is an anhydrous substance, melting at 240° F. to a colourless oil, which solidifies in a radiated mass on cooling. Pyrogallic acid, when dissolved in alkaline solutions, absorbs oxygen with great avidity, yielding solutions which are variously coloured, according to the nature and quantity of the alkali, ultimately turning to a brown or mouldy substance, acetic acid perhaps being formed at the same time.

Uses.—This beautiful preparation is employed by photographers as a developing or reducing agent, principally in the negative collodion process. It acts so vigorously in this respect that it may not be used alone, but is invariably mixed with an acid to retard and regulate its action. The acids usually employed for this purpose in the preparation of negative developing solutions are acetic acid and citric acid; and the reasons for preferring one to the other vary with the character of the collodion, and the circumstances under which the picture is taken. Acetic acid is not so powerful a retarding agent as citric acid, and, in consequence, the reducing power of the pyrogallic acid is more free to act. A developing fluid, therefore, prepared with these two acids is especially applicable in the case of simply iodised collodions at moderate temperatures, with an equable and due amount of illumination to the whole picture. The proportion of the acid to the ounce of water varies from five to thirty minims, according to the judgment of the operator. It need only be stated in this place that the maximum of density is yielded by the minimum of acid; but that in collodions which give a fair amount of density, it is better to employ the largest proportion of acid, with a view of avoiding stains in developing, and causing a more equal reduction in the silver. It should be borne in mind, also, that in proportion as the acetic acid is diminished in quantity, the alcohol should be increased, in order that the fluid adhering *to* the plate, and that poured *upon* it for the purpose of developing the latent image, should be as near as possible of the same specific gravity, and thus avoid the stains which would be caused by inattention to this particular. A developer prepared with pyrogallic acid, in combination with citric acid, may be regarded as a weaker reducing agent than one in which acetic acid is used; and this arises from the fact that citric acid is a more powerful retarding agent than acetic—three-quarters of a grain of the solid acid being equal to about twenty minims of the liquid. Photographers find it highly convenient to avail themselves of this property when working with large plates at a high temperature. As a general rule, chemical reactions proceed with much greater energy when the liquids are warm than when they are cold; and, in consequence, it is found in practising the wet collodion process in a tent in the summer time, that a weak developer, such as is produced by the combination of citric and pyrogallic acid, is quite sufficient to produce detail, even in the darker shadows of a picture.

When collodion iodised with cadmuim is used for landscape purposes, the plate comes from the bath in a nearly neutral condition, owing to the absence of free nitric acid, which is always eliminated in the case of a collodion containing free iodine, which a cadmuim collodion does not. Citric acid should therefore be employed in the developer, to prevent over-action in the high lights, and consequent general feebleness of the image. A pyrogallic with citric acid developer is, however, unsuitable for a bromo-iodised collodion. Pyrogallic acid with citric acid produces a negative of a bluish tint; and as this colour is very favourable to the passage of the actinic rays, the real intensity of such a negative is much less than it seems to be—or, in other words, negatives produced in this way will be found to be "quick-printing" negatives. Pyrogallic acid may be sometimes used with advantage for intensifying a negative taken by the collodio-albumen process, which has been partially developed by gallo-nitrate of silver. It should be done, however, with caution, as it is apt to produce fogging. Pyrogallic acid is also occasionally employed as a developing agent in the positive collodion process, in which case nitric acid should be added as the retarding agent, as the image produced when acetic acid is used is yellow and dull. If the proportions of two grains of pyrogallic acid, one drop of nitric acid, and one ounce of water be observed, the image produced is purely white and lustreless; while, if the proportion of nitric acid be increased, the deposit becomes metallic, and the middle tints of the picture suffer deterioration.

Impurities and Tests.—The principal impurities likely to occur in this delicate preparation are metagallic acid and sundry empyreumatic products of an indefinite nature, which have the effect of diminishing the reducing power of the acid, while, by unduly increasing the opacity of the image, they fail altogether in producing the more delicate shadows of the picture. Metagallic acid occurs as a black, shining, amorphous substance, insoluble in water, but soluble in alkalies, from which it may be again precipitated as a black powder by the addition of an acid. It would be immediately recognised by its colour when occurring as an accidental impurity in pyrogallic acid. An undue amount of empyreumatic product would be indicated by the odour possessed by a sample so contaminated. Pure pyrogallic acid, crystallised from its aqueous or alcoholic solution in vacuo, should possess no odour; and in proportion as commercial samples are free from smell, so is their purity from empyreumatic products. Both these impurities occur in the manufacture from want of proper attention to the temperature at which the sublimation is allowed to take place—a circumstance which ought not to cause much surprise when the present reprehensible desire for cheapness is remembered; for the writer does not remember to have heard very frequent allusions to metagallic acid or empyreumatic products when pyrogallic acid was sold at five shillings a drachm. It is probable that it paid the manufacturing chemist to bestow more attention then than it does now, when the same preparation can be bought for five shillings an ounce.

Effect of internal use.—No case of poisoning on record. It has an extremely bitter taste, and would probably act as an astringent. It is said to be as bitter as salicine.

Antidote.—Not known.

ON THE CHOICE OF A DRY PROCESS.

By George Shadbolt.

[Read at a meeting of the Bradford Photographic Society, October 3rd, 1861.]

Having been invited by your Honorary Secretary to contribute a paper to be read at one of your ordinary meetings, I have, at his instigation, selected the consideration of the relative advantages of the various preservative processes as my theme. It is not improbable that some might be inclined to do what in Parliament is designated "moving the previous question"—*i.e.*, discuss whether it is worth while to forsake the ordinary moist collodion process for any preservative process at all; but this is a question already settled with the majority of amateur operators, as far as landscape photography is concerned, it being not a matter of choice but of necessity with them to adopt some preservative process, or abstain altogether from photography "in the field."

It has been not unfrequently objected that the quality of the pictures upon dry plates is never equal to the best of those taken on wet collodion; but this is an assertion which I am by no means ready to admit as proved. On the contrary, I am convinced that, excepting where figures are included in the subject depicted, there is no need for the dry-plate negatives to be one whit behind wet ones in quality; and then only because the extra time of exposure demanded causes an air of constraint to be assumed by the several persons included in the picture, even supposing that they have not, during the exposure of the plate, spoilt it by movement. On the other hand, there is a positive advantage in the employment of preserved plates where a very protracted exposure is needful—such as for dimly-lighted interiors, &c.—because the condition of the sensitive surface is uniform during the whole time of exposure, whereas with a moist film this is not the case; but at any rate, whatever decision we may arrive at on these points, assuming that we determine for any cause to adopt some kind of preservative process, it is certainly not a matter of indifference which we shall select; and yet it would be, I believe, impossible to point to any one and say with perfect truth—"this is the *best*."

The fact is, that the several processes for dry-plate photography may be compared to the various brushes and pigments used by the painter, according to the effect which it is his object to produce, and which he finds most convenient to employ under each particular requirement of surrounding circumstances.

In photography personal predilections and aversions to certain methods of manipulation must always have a large share in determining the selection of a process; and correctly so, for it is notorious that few, if any, succeed in performing well that which to them is especially obnoxious. I may here remark that I believe it to be quite possible to take good negatives by nearly every one of the processes and modifications that have been introduced, including even that one which was proposed originally in joke—the "gin-and-water process." Of course I need scarcely add that I have no doubt that raspberry syrup may be very well employed, though I should no more think of advising its selection preferentially than I should gin-and-water.

Amongst the most important of our considerations before adopting any mode of proceeding is the length of time which we desire our plates to remain in a sensitive condition before exposure; and subsidiary to this is another, viz., how soon after preparation do we desire to be able to use them? As a general rule, it may be assumed that plates which will remain effectively sensitive for the longest space of time prior to use, are not capable of being made so rapidly impressionable as those which will only keep good for a shorter period—that is to say, with our present knowledge of the laws which appear to govern the development of the photogenic phenomena.

An intelligent photographer, who is desirous of reaching a high standard of excellence in his productions, cannot expect to do so without making himself acquainted with the broad principles to be kept in view in order to attain his end. He will not be contented with merely following directions however minute in detail, or adhering to formulæ however perfect, but must have a good and sufficient reason for every step in the operations which he adopts. The saying that "the letter killeth, but the spirit giveth life," is equally true in photographic as in matters of much higher moment.

It will be advantageous to start with the following principles as a "base of operations:"—

Pure Iodide of Silver *alone* is incapable of being darkened by exposure to light of any degree of intensity, or for any reasonable length of time: it is, therefore, commonly regarded as *insensitive* to the action of light. Of this I have my doubt, but it is immaterial so far as our present object is concerned.

Bromide of Silver is capable of being darkened to some extent by the action of light, even when pure.

Chloride of Silver is not only sensitive to light, but is capable of complete reduction to the metallic form.

With the preceding three salts of silver, insoluble in water, the contact of organic matter materially exalts their readiness to receive an actinic impression, either latent or visible, as the case may be; hence, in every photographic process (except the Daguerreotype) the presence of organic matter, in some form or other, is regarded as a *sine quâ non*. There is nothing here stated that is not well known to all scientific and to many ordinary photographers, but it is a point of importance to bear in mind.

The *visible* photographic image requires for its production the presence of a substance readily reducible under the influence of some de-oxidising agent; hence the absolute necessity of conjoining with the iodide and organic matter another salt of silver, which for convenience is generally the nitrate of that metal, but it may be without detriment reduced to an almost infinitessimal quantity until *after* the actinic impression has been received: it must, however, be added before or contemporaneously with the application of the developing agent. The smaller the quantity of nitrate of silver present, the longer will the sensitive film retain its powers undeteriorated; and further it appears that the presence of nitrate of silver may be altogether dispensed with before exposure, if we substitute for it the *oxide* of the same base in combination with organic matter, or some other silver salt.

Let us now examine the various processes in detail, bearing these facts in mind; and, as one of the simplest in principle, we will commence with—

Albumen upon Glass.—An alkaline iodide (with or without bromide or chloride) is dissolved in the albumen, and finally spread upon glass plates and dried. The plates are immersed in a solution of nitrate of silver to render them sensitive, and by double decomposition iodide of silver is formed in contact with the organic matter (the albumen), which itself unites with a portion of oxide of silver obtained from the nitrate. The film of albumen at the same time becomes coagulated, and consequently hardened in a surprising manner. So far everything is in favour of this process; but there are several serious disadvantages attending it. In the first place, it is not easy to obtain a film of uniform thickness, partly from the length of time required in drying, which, under favourable circumstances, must occupy several hours; and therefore the albumen has a tendency to collect towards the lower edge of the plate if it be not perfectly horizontal, and the extra thickness of film in the finished negative makes an immense difference in the power of arresting the actinic rays. Secondly, the time occupied in drying the film renders it liable to be readily contaminated by minute particles of dust falling on it, and each particle becomes under the developer a centre of chemical action, causing a circular spot on the film. Thirdly, in consequence of the comparatively large quantity of organic compound with oxide of silver (after sensitising), there is a tendency to spontaneous reduction, and consequently fogging, without the previous action of light; hence it is necessary to supply an oxidating substance in order to restrain the spontaneous decomposition. For this purpose a considerable quantity of acetic acid is added to the nitrate bath, and the result is a materially diminished sensitiveness of the film, so that the process is generally found to be a "slow" one. It is manifest that none but an experienced hand would be likely to adopt this process as his first essay in preservative ones, although we believe it to have been the first dry process upon glass plates.

The Collodio-albumen or Taupenot Process is one originally introduced by Dr. Taupenôt (a French amateur), with a view to obtaining the advantages of the rapidity of collodion with the excellent qualities of albumen combined. Although in the special object aimed at the process did not come up to the expectations of the designer, it is one that has deservedly met with much favour, and by which very excellent results have been attained. By the previous application of collodion to the glass plate a much more uniform and a thicker film of albumen can be applied than when it is omitted, it acting in the capacity of a very delicate sponge, in addition to which the film of iodide of silver produced by an immersion of the collodion in the nitrate of silver bath is supposed by some to have the beneficial effect of shortening the time requisite for exposure in the camera. Unfortunately, however, the advantages are not obtained without some corresponding disadvantages, the chief of which are liability of the film to blistering, and the necessity for sensitising and washing twice instead of once. By careful manipulation the former defect can be avoided, but I think the difficulty sufficiently great to deter the novice from adopting this in his *first* dry-plate attempt.

The Fothergill Process is closely allied to the preceding, but differs in the important particular that the operation of sensitising has to be performed but once; and, although not entirely free from liability to blistering of the film, it is far less obnoxious to this annoyance than its earlier congener. A tyro in dry-plate photography may well adopt this for his first essay, especially as there are several modifications in manipulation from which he may choose; but, whatever be the modification adopted, the principle upon which success depends is the presence of a minimum quantity of a compound of albumen and oxide of silver in contact with the iodide of silver in the collodion film. I would suggest the following slight variation of Mr. Hannaford's modification of this process, suggested by Mr. Barber:—Coat the plate with a collodion of a non-contractile character, which, however, must not be of the powdery kind; after removal from the silver bath soak it in filtered

rain water, changing the same twice or thrice at least, so as to remove all but a mere trace of the free nitrate of silver; drain for a few moments, and then pour over the plate sufficient of the albumen solution to cover it perfectly; then drain and dry *thoroughly*, finishing the drying by the application of heat, for which purpose a clean brick made hot in an oven, and placed near the plates, is very convenient; or, after draining, the albumenised plate may be immersed in water nearly boiling. The albumen solution is made by adding to *one ounce* of the white of egg *seven ounces* of distilled water, and a sufficient quantity of oxide of silver dissolved in ammonia. The sufficient quantity should be determined by trial; but probably eight grains of oxide in eighty minims of liquor ammoniæ to the above-mentioned quantity of dilute albumen would be about the mark. It is needful to keep the albumen solution thus prepared rigidly from exposure to light.

Dr. Hill Norris's Process is one that deserves consideration, from its great simplicity. It is the opinion of the designer that the gelatine with which the collodion film is covered after sensitising acts chiefly mechanically, by preventing the cells (if I may so designate them) of the collodion from becoming impervious to aqueous solutions. The substitution of gum, dextrine, metagelatine, &c., for ordinary gelatine, does not, in my opinion, affect the integrity of the process, which is essentially the same whichever of those substances may be found most convenient by each individual operator. This process is one quite worth the attention of a beginner. One essential requisite to success in this process is the entire removal of free nitrate of silver from the film prior to coating it with the gelatine; and, for the benefit of my auditors, I may as well indicate a mode of proceeding which I have myself practised with great satisfaction.

After coating the plate with a non-contractile collodion, and sensitising it in the ordinary thirty-grain neutral nitrate of silver bath, I poured over it a syrup made of honey one part, distilled water two parts (by measure): the honey dissolves readily on the application of heat, and the solution must be filtered through bibulous paper prior to use. In all samples of honey a considerable quantity of pollen is present, each grain of which would cause a spot if the filtration were omitted. If kept in small phials *quite full*, the syrup will remain good for many months. When the syrup lies evenly on the plate the latter is washed freely under the tap, until, on draining the plate, the last adhering drop of water ceases to excite any sweet or metallic taste when applied to the tongue. Solution of gelatine, three grains to each ounce of water, with ten per cent. of alcohol added, is then poured hot over the plate, which is subsequently drained and allowed to dry, when it is ready for exposure.

The gelatine solution is made by soaking three grains of gelatine in an ounce of *cold* distilled water, and, when it has well swelled, is to be dissolved by application of heat. It is well to make about twenty ounces at a time. When cool, the white of an egg is to be added, and well mixed: the whole is then to be made quite hot, to coagulate the albumen. The mixture must be permitted to stand for a minute or so, and then be poured through a conical flannel bag (a jelly bag) in front of the fire. The first portion that runs through will not be quite clear; but, by pouring it through the flannel filter a second time, it will become quite brilliant. Two ounces of alcohol may then be added to preserve the solution, and it is fit for use.

When about to be used, the bottle should be stood in a jug of hot water to render it fluid, and a small quantity made very hot, in a glass beaker, by means of a water bath, for covering each plate. The chief object of the honey syrup is to entirely remove the free nitrate of silver; but I believe it is also useful in another way, rendering the plate rather more sensitive than when prepared without it, although but an infinitesimal quantity of the compound of honey and oxide of silver can possibly be left on the plate. I think it highly probable that the same method of operation might be useful in the next process I shall notice, viz.—

The Tannin Process of Major Russell, which is very uniform in affording fine results. It bears some analogy to Dr. Norris's process, though it has quite sufficient novelty to preclude its being merely classed with the latter, inasmuch as gelatine, gum, &c., if not actually inert substances, are very much less active than tannic acid; and, while the former tend to cause the film to adhere to the glass, the latter tends rather to make it easily separate. This process entails a trifle more trouble than some others, but not sufficient to deter *debutantes* from attempting it, especially when aided by the very minute directions for its practice contained in the work recently published by its author.

The Resin Process certainly may claim a first place for simplicity. With the addition of a minute quantity of common resin to any good negative collodion, the sensitised plate has merely to be well washed and thoroughly dried to be fit for use. It also has its difficulties, or rather tender points; but by the adoption of certain precautions these can be avoided. The most difficult to remedy is a defect which it has in common with the tannin process—liability of the film to slip off the glass during and after development. In both cases varnishing the edge of the plate is recommended as a preventive.

Of the Moist Preservative Processes, contemptuously designated by some the "sticky" processes, it is natural that I should give the preference to the use of honey, which I certainly do; and still more, I may say that, if my object be to prepare plates that I am certain to use within twenty-four hours after preparation, I prefer the honey process to any other preservative process yet devised; because I can not only prepare my plates more rapidly, and expose them sooner after preparation, if I require to do so, than those by any dry process whatever, but they involve less subsequent labour in development, and are more sensitive, I believe, than any other preserved plates, either dry or "sticky." They are, however, not so well adapted for "keeping" any considerable length of time, and are more liable to be spoiled, from the fact that minute particles of dust, &c., falling on the plate are sure to adhere to it. The same observation applies, however, to all the "sticky" processes, of which the oxymel and the malt process are the only other representatives, in my opinion, worth particular attention. The raspberry syrup being a mere variation of oxymel and glycerine almost invariably producing a fogging, I do not include in the category of probabilities for adoption.

From the preceding remarks it will be perceived that I am inclined rather to favour the Fothergill, tannin, and resin processes amongst the dry ones for choice, my own predilection being rather with the first named; and for a moist process, certainly the honey retains my affections above all its competitors. There are, however, always little personal considerations which rightly enough influence an operator in the choice of the particular mode of manipulation which he finally adopts, and which I have before remarked should be allowed to have their full weight.

Before bringing my observations to a close I would add two remarks by way of caution. The first is, never to forget that, when the free nitrate of silver has been removed, it must be restored before or at the time of development, or no picture will appear. The second: having once selected a process on which to try your hand, do not give it up from having a few or even many failures, but persevere until you do succeed with it, as you surely will if you faint not; and then, if you have a mind to change it for another, remember that your previous labour has *not* been thrown away, but that you have gained experience in one process that will certainly be useful in any other you may work upon eventually.

THE INTERNATIONAL EXHIBITION OF 1862: WHAT ARE THE ARRANGEMENTS MADE FOR REPRESENTING PHOTOGRAPHY THERE?

By C. Jabez Hughes.

[Read at a Meeting of the South London Photographic Association, October 10, 1861.]

A few days since, I took my walks in the neighbourhood of South Kensington, and for the first time saw the great building in course of erection for the International Exhibition of 1862. I was surprised, astonished, and delighted. I was not prepared for the great progress made. In my mind the intended Exhibition had been a vague, indefinite, unsubstantial possibility—a thing requiring much more talk, and thought, and calculation, and noise, and bother, and puff, and advertising, before it could take a material existence. Yet there the great fact stood before me; and a very great one it is. As I wandered down its great length, and gazed on the stupendous crystal towers in course of erection, I began to realise the vastness and grandeur of the scheme. As the shell typifies the fish, as the cast indicates the model, and the house the tenant, so surely does this vast and grand building imply the magnificent collection of the world's choicest products speedily to be there collected. With an undying remembrance of the glories of 1851—with a vivid recollection of the Exhibition of Dublin and the Art Treasures of Manchester—deeply impressed with what has been done on the *Champs Elysées*, and with what has been perpetuated at Sydenham—with these souvenirs fresh in my mind, I look to the new Exhibition to eclipse them all. It cannot have the startling prestige of 1851, nor, falling on less pacific times, will it pretend to herald in a delusive peaceful millenium; but it

comes at a more stirring and energetic period, and will bear many of the fruits of which the former great Exhibition only laid the seeds.

Vast and varied, however, as this mighty collection will be, its distinguishing characteristic will consist in the grand display of modern fine art. All nations will contribute examples of their greatest living and recently deceased artists. *La belle* France, young Italy, æsthetic Germany, clever Belgium, realistic Holland, even distant Russia, will send their trophies of science and art and industry to compare with the treasures of Old England.

And when this grand collection is brought together—when this galaxy of talent is convened—amidst this very constellation of genius, we, as photographers, naturally ask, How will our favourite pursuit be represented? When all the sister arts are assembled in their choicest and most brilliant attire—Painting glowing with all the charms of colour, and Sculpture in her purest forms; the industrial arts each in its most attractive guise; Music, with enchanting strains, and Poetry beautifying and idealising all—in this gay assemblage, and in the presence of wisdom, and rank, and wealth, and youth, and beauty, where shall we look for our idol art? Will it occupy the distinguished position to which it aspires? Shall we see it appear with its credentials in its hand, and claim a place among the highest arts? and will its claims be acknowledged and itself welcomed into the inner and charmed circle as the most youthful of the arts? Will the protecting geniuses Wisdom and Beauty recognise this young offspring of Science and Art, and, placing it on its pedestal, call upon all to pay it homage? and, clothed in the robes of beauty, with the effulgent star of truth on its brow, shall we witness its apotheosis?

Or, to employ humbler imagery, shall we find photography at the new Exhibition like the celebrated five wise virgins? Will its lamps be trimmed, and will it be ready and equal for the occasion? Or, will it be found without preparation, with no oil in its lamps, so that, like the five foolish ones, when the cry comes it will not be prepared to go in, and then the door will be shut. Should great exertion be afterwards made, large lamps with abundance of good oil provided, and much knocking at the door be made, it will be very mortifying to be told by the Commissioners, we know you not; you complied not with our regulations; you have been more foolish than the foolish virgins—you knew both the day and the hour, and availed not yourselves of the knowledge, and you must submit to the consequences.

It is to be hoped that little of this mortification will be felt, and that photographers, like wise virgins, have availed themselves in time and duly applied for space, and that they have determined to send the best things they can produce. But whatever photographers, individually, have done, in their collective capacity, nothing, or worse than nothing, has taken place to represent photography in such a manner as to be creditable to the art or honourable to the nation.

For foreign photography I have not much fear. I have every reason to believe it will be numerously and worthily represented. The same causes have not been at work with them to damp their ardour and check their enthusiasm.

It is for the English portion that I entertain fears. At least ten years will elapse before a similar occasion will occur of displaying the immense improvement in our art and its endless applications. It was a great misfortune that the Commissioners should have adopted so unfortunate a classification, so far as photography was concerned; but it was a still greater misfortune that the Council of the Photographic Society could see no other way out of their position than to abandon the project of a Committee of photographic gentlemen, to manage the photographic section, because the Commissioners would not cede the point in dispute. It is to be lamented that the Council, after having so argumentatively established their case, could not accept the proposal of a separate department for photography. Although photographers are well convinced that this art is entitled to rank among the Fine Arts, yet when the position is controverted they could hardly be expected to be allowed to be judges in their own favour. The Commissioners are not the sole persons who deny it the right. The great body of artists, and they are popularly supposed to be the best judges, say that our art has no place among the Fine Arts. When, therefore, the Commissioners offered a separate department they practically said—"We will not debate the question with you, but we will supply you with the means whereby you can substantiate your position; and if it prove that we have done you an injustice, the more credit will be due to you by proving that we, in common with many more, have not sufficiently appreciated this new and rapidly-improving art. The verdict being given by competent parties in your favour, we will acknowledge that you have fairly won your spurs, and in future we shall freely accord that place to photography which it has shown itself worthy to hold." The Council, however, saw fit to stand on their dignity, the Commissioners felt they could yield no more; and between these two stools photography has fallen to the ground. The opportunity that was afforded of enlisting the sympathies of all British photographers to exhibit the usefulness and beauties of their art to its fullest extent is past.

How much more effective the Exhibition would have been if a central committee had been established with a comprehensive plan, and supported by the cordial co-operation of local committees, carrying out the details, as compared with individual efforts working without purpose or arrangement, no one can tell; but the results would certainly be very different.

There can be no doubt a great opportunity is lost; and however photography may gain, nothing like the benefit will arise that might have occurred had full advantage been taken of this rare occasion. In the 1851 Exhibition photography was a crude, undigested mass. Portions were to be found here, there, and everywhere. Shimmering and glittering on silver, hard and wiry on albumen, woolly and foxy on paper. Without natural guardians, it wandered about the great building, having a home nowhere. It made a small lodgment among the ivory miniatures, was principally to be seen amongst the stationery, was frequently cropping out of the foreign department, and formed the only brilliant display in the deserted settlements and backwoods of the American department. In 1861 it has its natural protectors: they, however, are not adroit enough to keep it in their own hands, and cruelly allow it to sink or swim, rather than yield a little of their own opinion. When we last assembled here the question was, should a committee be appointed to arrange the proper display of photography, seeing that the latter was placed in a mechanical department: against this we all remonstrated. As I have already said, another offer was next made, that as photography was *sui generis*, to provide a separate place for it—an offer which, under protest especially, might, in my humble opinion, without any loss of dignity, have been accepted; but this also was rejected, and matters are worse than at first, viz., our pictures are still left in their original mechanical location, without even the committee of photographers to overlook, arrange, and advise.

Thus the matter stands. While all other portions have gentlemen to superintend them who are learned and interested in the various details, poor photography stands alone. Who is to take charge of it, or whether any one is to take charge of it, we do not know. Whether it is to be placed under the tender mercies of the gentlemen who arrange the agricultural implements or the ship's tackle we are in doubt; but as the pictures can neither arrange nor hang themselves, it is but natural that we should desire to know to whom they are to be entrusted. It is also of the highest importance that we should know whether any plan or method is to be devised or recommended for intending exhibitors to conform to, so that the few fine days that may occur before the period for sending in pictures may fully be taken advantage of. Will there be any endeavour to form a *historical* collection? Is it desirable to forward the *curiosities* of the art? Ought *processes*, as such, to be specially illustrated? Will morbid photography be admissible, that is, *failures* to which reliable causes may be assigned? Will limitations be assigned as to size, quantity, or number of pictures? Are *negatives* to be sent as well as positives? Will any means be taken so that an instructive collection of the various dry processes will be seen? Is there any principle of classification or arrangement to be adopted? Are pictures to be grouped according to size, or subject, or exhibitor? In fact, questions crowd on my mind arising from a natural anxiety that justice should be done to photography, and from a fear that its arrangement may be entrusted to hands that even with the best intentions may not be able to grasp the character of the subject. Had a committee of gentlemen of well-known ability been appointed, these doubts and fears would not have arisen, for the characters of the committee would have been a guarantee. As matters stand it is extremely desirable that photographers should be furnished with this information.

It must be borne in mind that this coming Exhibition is no common one, and that many variations may be required from the usual photographic displays. Our usual Exhibitions are visited chiefly by amateur and professional photographers, their friends and acquaintances, and a small quantity of *dilletante* persons; the generality of folks never see, and seldom hear of them. But in the forthcoming great show, the great stream of the people will flow past, and tens of thousands will see them who never saw a collection

of photographs before, and never will again. For this reason it is I regret that the occasion will not be improved to the fullest extent.

But though it is no use making useless regrets, it is of the utmost consequence that the Commissioners should quickly appoint some gentlemen of sufficient knowledge and technical experience, and, if possible, whose names are well known to photographers, to take charge of and arrange the whole. It should be their duty to form a comprehensive plan, sufficient to embrace foreign as well as home photography, and to carefully follow that out. Whatever directions are intended to be published for the guidance of exhibitors should be issued as soon as possible, so that all reasonable aid may be afforded them. It is to be hoped that, undeterred by the adverse influences that have been in operation, our best men have been alive to their interests, and have secured adequate space, so that they may honourably shine by the side of their foreign brethren. Lamentable, indeed, will it be, if in our own Exhibition we alone are found wanting. What shall we say for ourselves, when all other artists are striving their utmost to sustain the national honour, that photographers alone make a mean display; and little short of national disgrace will it be, if, in the land of Herschel, and Brewster, and Wheatstone, and Hardwich, the works of her Bedfords, and Williamses, and Mudds, and Mayalls, and Claudets, and Lacys, and kindred artists, are not present in sufficient abundance to do honour to the great names of Talbot and Archer.

THE CONSTITUTION OF THE SOLAR ATMOSPHERE AS REVEALED BY SPECTRUM ANALYSIS.*

By Samuel Highley, F.G.S., F.C.S., &c.

(Continued from page 342.)

At the meeting of the British Association held at Cambridge in 1845, Professor W. A. Miller read a paper *On Experiments and Observations on some cases of Lines in the Prismatic Spectrum Produced by the Passage of Light through Coloured Vapours and Gases, and from certain Coloured Flames*, which was afterwards published in the August number of the *Philosophical Magazine* for the same year.

The first part of this paper will be more fittingly alluded to at an advanced stage of our subject; but in the portion relating to the spectra of coloured flames, Dr. Miller adds to the contributions of previous observers, and appends a well-executed map of the various spectra that had occupied his attention. Like Bunsen and Kirchhoff, he chiefly employed the chlorides of the bodies subjected to investigation and determined the characteristics of boracic acid, nitrate of strontia, and of the chlorides of barium, calcium, sodium, copper, and manganese.

Miller expresses an opinion that certain feeble bands that occur in the green portion of the spectra of the chlorides of iron, zinc, cobalt, nickle, mercury, and magnesia, are due to the chlorine and not to the bases of these salts.

He also points out that bichloride of mercury gives a bright band near G in the indigo, and in his map of the calcium spectra lays down the blue line omitted in Bunsen and Kirchhoff's map, which omission led the Messrs. Dupré to believe that they had discovered a new metal belonging to the calcium group of metals,† but which Bunsen and Kirchoff afterwards stated they *had* observed, but had not regarded as being *sufficiently* characteristic to be noticed in their paper.

Miller concludes his paper with an observation which is remarkable, when taken in connexion with Kirchhoff's recent theory of the nature of the solar atmosphere, which will be given towards the conclusion of this article. Miller says:—"It may be interesting to remark, in connexion with the speculations on the absorptive action of the sun's atmosphere, that if solar light be transmitted through a flame exhibiting well-marked black lines, these lines reappear in the compound spectrum, provided the light of day be not too intense compared with that of the coloured flame. This may be seen in the red light of the nitrate of strontia, and less perfectly in the green of the chloride of copper. IT WOULD, THEREFORE, APPEAR THAT LUMINOUS ATMOSPHERES EXIST IN WHICH NOT ONLY CERTAIN RAYS ARE WANTING, BUT WHICH EXERCISE A POSITIVE ABSORPTIVE INFLUENCE UPON OTHER LIGHTS."

Nor must the investigations of Mr. Crookes himself be ignored; for it is known to many that, with a modification of the spectrum apparatus he described at page 292 of the second volume of the *Journal of the Photographic Society* for 1856, he has for several years past been carrying on experiments connected with the spectra of various salts; and it is to be regretted that he has hitherto allowed the bulk of his numerous observations to remain unrecorded, as he thereby runs a chance of losing any claims he may have as a discoverer, through want of priority of publication; for if he has not discovered any other *new* metals besides that he has recently described in the *Philosophical Magazine*, at any rate the spectra of the greater portion of the *known* elements have been worked out by him, although they remain undescribed.

Professor Stokes published a valuable paper in the *Transactions of the Royal Society* for 1852, wherein (at page 522) he claims for the prism a place in the laboratory, and describes a method of observation, viz.:—fusing certain metallic oxides with a bead of microcosmic salt, and "viewing through a prism the inverted image of the flame of a candle formed by the bead, the latter being so held as to be seen projected on a dark object."

Some years since Sir David Brewster described some experiments* on the *absorptive* power of coloured media over the rays of the spectrum. Coloured fluids, such as red and black ink, though equally homogeneous, stop or "absorb" different kinds of rays. The same takes place with coloured glasses. Thus, on examining a bright spectrum through a piece of blue glass, such as is used for finger basins, the greater part of the red and orange rays disappear (being absorbed), and the yellow band greatly increases in breadth, encroaching on the spaces previously occupied by the orange rays on one side and the green rays on the other. Hence this transparent medium produces the effect of its colour by *transmitting* only those rays which in combination form the particular kind of blue, but which, *plus* the absorbed rays, would produce white.

On the 2nd of February, 1857, Dr. J. H. Gladstone read a paper before the Chemical Society *On the Use of the Prism in Qualitative Analysis*, and on the 6th of February he delivered a lecture before the Members of the Royal Institution on the same subject [see *Proceedings of the Royal Institution* for 1857, and the *Journal of the Chemical Society*, vol. x, p. 79.] It was at this period that we became familiar with the method of applying the prism to analytical purposes, as we were frequently in communication with Dr. Gladstone, and some of his experiments were conducted at our own laboratory. Dr. Gladstone adopted a different method from that followed by previous experimenters, viz:—examining the spectrum of the sun, diffused daylight, oxy-gas lime light, &c., after having passed through a wedge-shaped block of the transparent coloured media under examination, or more generally through a stratum of solution of the substance to be analysed when placed in a wedge-shaped glass vessel, and observing the rays that were *absorbed*. This wedge-shaped vessel was of the greatest importance; for in most cases the different rays of light are not absorbed immediately on entering a body of liquid, but only after they have penetrated to a greater or less distance, and then they disappear—not suddenly, but by becoming gradually fainter and fainter: hence a wedge-shaped vessel, filled with liquid, allows the light from a knife-edged slit to pass through various thicknesses, varying from the thinnest possible film to a stratum of three quarters of an inch in thickness; and, when this is examined by a prism, the thinnest part shows a series of colours differing little from a continuous spectrum. But, as the liquid gets thicker and thicker, some rays are seen to diminish in intensity, others gradually to die out, while others again disappear suddenly and give place to complete opacity. With good apparatus and bright daylight, the most prominent of "Fraunhofer's lines" are apparent through the thinnest stratum of liquid, which serve to indicate with the greatest accuracy which rays are transmitted and which absorbed. From numerous observations on various salts, of which twenty-five TYPICAL "absorption spectra" are figured, Dr. Gladstone deduced the rule—*that all the compounds of a particular basis or acid have the same effect on rays of light;* and he concludes his paper with the remark that—"these observations will be sufficient to prove that the varying chromatic phenomena exhibited by different substances may be taken advantage of in qualitative analysis, to an extent which has been hitherto unappreciated;" and any one "might easily make such a series of observations as would furnish data for regular tables of comparison, and the prism would then take its place, as the blow-pipe does now, among the recognised and almost indispensable instruments of the analytical laboratory."

Since that period, till the appearance of Bunsen's and Kirchhoff's important contribution, in 1860, little of importance seems to have been published in this country in connexion with analysis by aid of the prism. As regards continental observers it should be mentioned that, besides an illustrated memoir by Masson, pub-

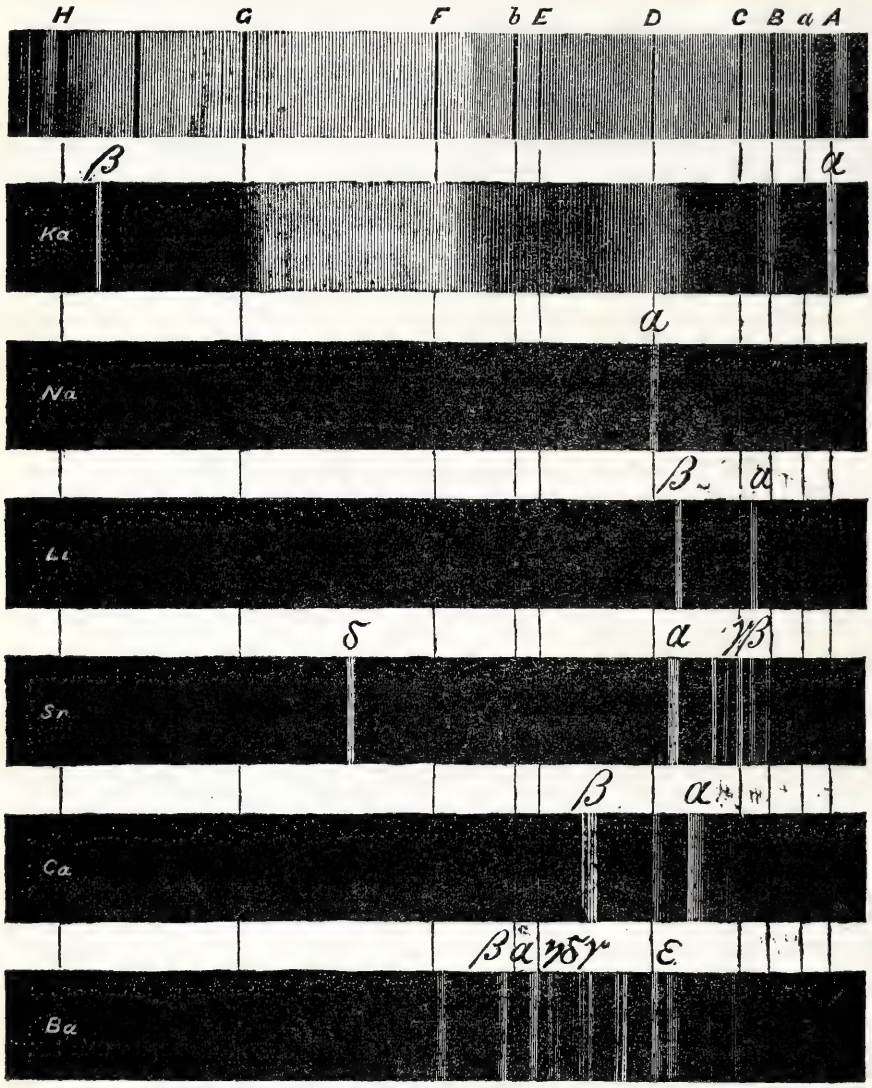
* As Professor Miller has gone over the same ground as myself in his lecture before the British Association, it is again necessary to state that this article was *in type* on the 9th of September.—S. H.

† See *Philosophical Magazine*, for February, 1861, No. 138, p. 86.

* *Transactions o the Royal Society of Edinburgh*, vol. 12, p. 123.

lished in the *Annales de Chemie et de Physique* in 1857, and a paper by Angström, published in *Poggendorff's Annalen*, vol. xciv., p. 141 (a translation of which, by Tyndall, with illustrations, appeared in the volume of the *Philosophical Magazine* for 1855), on "Electric Spectra," Van der Willigen and Plucker have more recently contributed beautifully-illustrated memoirs on the spectra produced by the discharges of Ruhmkorff's coil; and in the March number, 1860, of the *Philosophical Magazine*, Professor Stokes calls attention to some observations of Fourcault (made in 1849) on the spectrum produced by the electric arc, that have bearing on Kirchhoff's theory of the nature of the solar atmosphere.

Professors Bunsen and Kirchoff, in their first memoir, published in *Poggendorff Annalen*, 1860, point out the most characteristic spectra of the salts (chiefly chlorides) of potassium, sodium, lithium, strontium, calcium, and barium, after the purity of each of the compounds had been ensured by their careful preparation. These they embodied in a coloured diagram, a reduced uncoloured copy of which is given in *figure* 3. From this it will be seen that little has been added to the spectrum observations of the previous observers we have alluded to in our abstract of their researches. The special points of interest in Bunsen and Kirchhoff's papers we shall give in our next number.



DESCRIPTION OF DIAGRAM.

Fig. 1 shows the principal lines of the solar spectrum for the purpose of comparison.

Fig. 2 represents the spectra of potassium. This is characterised by a RED ray at α (which is coincident with Fraunhofer's line A, being the same that was observed by Talbot) and a VIOLET ray, β, near the line H. Another very faint RED ray is sometimes apparent, which is coincident with the line B. These rays present themselves on the ground of a widely-extended continuous spectrum.

Fig. 3, the spectra of sodium, which is characterised by a remarkably bright well-defined YELLOW ray at α, coincident with the double line D. Traces of a continuous spectrum are sometime apparent in the immediate neighbourhood of this ray. Brewster, Herschel, Talbot, and Miller, all pointed this ray out as a characteristic of soda.

Fig. 4, the spectra of lithium, characterised by a very bright RED ray, α, which stands midway between the lines a and B (being the same that Talbot called attention to) and a very weak YELLOW ray, β, near the line D.

Fig. 5, the spectra of strontium, characterised by six RED rays—of which Sr β and Sr γ are the most important—one ORANGE ray, Sr α, and one BLUE ray, Sr δ, all of which were indicated by Talbot in 1834. These, with some fainter rays, are also described by Miller.

Fig. 6, the spectra of calcium, characterised by an intensely bright ORANGE ray, Ca α, lying nearer to the red end of the spectrum than the sodium or strontium rays, and a bright GREEN ray, Ca β. Faint YELLOW and RED rays are also apparent, but not specialised. Miller's "*bright streak in the indigo*" is not shown in Bunsen and Kirchhoff's map, but it occurs near G, towards the violet end of the spectrum.

Fig. 7, the spectra of barium, characterised by the bright GREEN rays Ba α, Ba β, and Ba γ. Other faint GREEN rays, η and δ, are also marked, together with some faint YELLOW and RED lines, the most conspicuous being an ORANGE line at ϵ, and a blue line nearly coincident with the line F. All these are indicated by Miller, together with "one blue line in the indigo," which is not referred to in any way in Bunsen and Kirchhoff's paper.

THE TANNIN PROCESS.

By MAJOR RUSSELL.

CHAPTER III.

[*By the special permission of the Author we reproduce the following.*]

ALMOST any collodion will produce good results if properly managed, no matter how new and horny, or how old and rotten. Even should it be too old or too new to work well in the wet process, it will still succeed. Some difference will, however, be found in the character of the resulting pictures, though not so great as in the wet process, and there will be a great difference in the sensitiveness. A new collodion is the most sensitive, and in the writer's hands gives the proper red tone and vigour of negative perfectly, provided a strong solution of tannin be used. An old and powdery sample, on the other hand, even if rendered colourless by cadmium, besides being very insensitive, gives a pale grey image which will not develop with quite so much vigour and richness of tone, and the film when varnished is soft and liable to injury, whereas that produced by a new and horny collodion is, in hardness and durability, only inferior to albumen. A tolerably opaque film is advantageous, but not so necessary as in other dry processes, plates prepared with tannin being little liable to solarisation. Opacity should not be obtained by over-iodising the collodion, but by using a thick sample.

Simply iodised collodion may be used, but the presence of bromide greatly increases sensitiveness, intensity, and facility of development. Any collodion which is sensitive and gives good results in the wet process may be rendered suitable for use with tannin in the following manner:—Dissolve sixteen grains of bromide of cadmium and four grains of bromide of ammonium in one ounce of alcohol s. g. ·805: if the collodion be not iodised, mix three parts of this solution with five parts of the iodising solution, and to one part of the mixture add three parts of plain collodion. If the collodion be already iodised, add three parts of plain collodion to one part of bromide solution, and mix three parts of this bromised collodion with five parts of iodised collodion.

Positive collodion will require less bromide, as it usually contains some already; but the exact proportion of iodide and bromide is not of much importance. The addition of bromide of cadmium to collodion iodised with iodide of potassium, produces by double decomposition iodide of cadmium and bromide of potassium: the former impairs the fluidity of the collodion, and the latter, being nearly insoluble in strong alcohol, is almost all precipitated. If, therefore, the presence of iodide of potassium is shown by turbidity on the addition of bromide, it will be better to dissolve about two parts of bromide of ammonium and one part of bromide of cadmium in the smallest possible quantity of alcohol, s. g. ·816, and

to add this solution cautiously until turbidity is produced. The collodion will be found to be very little altered in fluidity and stability, and, when cleared by subsidence, to have retained enough bromide to improve it greatly for this purpose.

Should any doubt be entertained as to the good effect of so large a proportion of bromide as that recommended above, it may be easily removed by experiment. Prepare thirty-six drachms of iodised and eighteen drachms of bromised collodion in two bottles, the iodide and bromide being in the same proportion in both, and the same plain collodion being used in both cases. Coat and excite one plate or more with the iodised collodion; then mix half a drachm of bromised with four drachms of iodised collodion in a small bottle, and proceed as before; pour away into another bottle, and mix one drachm of bromised with four drachms of iodised collodion, and so on, increasing the proportion one-eighth part each time until equal quantities have been used. We shall now have nine differently constituted sensitive layers, varying by one-eighth in each case, from all iodide to equal parts of iodide and bromide. The residues, if all poured into one bottle, will be found to do very well for ordinary use. The plates, after being prepared with tannin, are then to be exposed a minimum time in a uniform light, using the same subject, and developed in the same manner, when it will be found that there is a rapid and regular improvement up to three parts of bromide to eight of iodide, and that further addition of bromide makes but little difference up to equal parts of each. Three parts of bromide to five of iodide will probably give about the best result; and it will be seen that this proportion leaves an ample margin both ways to allow for disturbing causes, such as a little bromide or an uncertain amount of iodide in the collodion, if of unknown composition. The different proportions of iodine and bromine in various iodides and bromides, and peculiarities in the quality of the pyroxyline, might slightly affect the quantity of bromide required to give the best result. The use of a large quantity of bromide has a tendency to diminish the opacity of the excited film. Should this effect be produced to too great an extent, a little more iodide and bromide may be added in the proper proportion to the collodion. Bromide may not produce so marked an effect if a trace of nitrate of silver be left in the film; but even if the presence of nitrate with the tannin appears to answer the same purpose as bromide, the use of the latter and the entire removal of the nitrate is, for many reasons, a preferable mode of treatment.

If the collodion be purposely prepared for use on gelatine with tannin, the following will be found to be a good formula:—

Iodide of ammonium	2	grains.
Iodide of cadmium	1	„
Bromide of cadmium	2	„
Pyroxyline, prepared by Hardwich's formula for negatives by the wet process	6	„
Alcohol, sp. gr. ·805	4	drachms.
Ether (the best which can be procured)	4	„

This collodion will require to be diluted with more alcohol and ether if used to coat large plates. The salts of cadmium give great stability to the collodion, and are very soluble in highly-rectified alcohol; but they render the collodion so thick as to be ill adapted for producing a good uniform film on a large plate. Iodide of ammonium has an opposite effect, rendering the collodion unstable, but very fluid; hence, by using different proportions of the iodides and bromides of cadmium and ammonium, we can vary the quality of the collodion in the above respects at will.

The iodide and bromide of potassium are intermediate in their effect on the stability and fluidity of the collodion, and stand between those of cadmium and those of ammonium; they are, however, less soluble in strong alcohol than either. Should it be desired to give the collodion more fluidity than that produced by the above formula, a larger proportion of the ammonium salts may be used; but this cannot be carried beyond a certain point, unless a portion of the alcohol be in a state of greater dilution with water.*

In all cases it is desirable, when much bromide is used, to employ a large proportion of the bromide of *cadmium*, on account of its great solubility in strong alcohol. The proportion of ether and alcohol is of no importance in this process, beyond its being such as is found to produce the most uniform and perfect film. The greater the quantity of water present, the larger must be the proportion of ether to work well. The proportion of ether required is also dependent on the quality of the pyroxyline: it should be large enough to render the film somewhat horny and free from mottled markings.

* The soft and granular kind of iodide of ammonium is better than that which is sold in hard crystals—the former, though less stable, being more soluble.

Almost any nitrate of silver bath will answer, if slightly acid, and not below the strength of thirty grains to the ounce. A neutral or alkaline bath will not succeed, being liable to cause fogging, and after this commences the half-tones will not develop. Hence a slightly acid bath may be said to give greater sensitiveness, although an excess of acid beyond what is necessary to keep the picture clear will greatly diminish sensitiveness. The following method of preparing a bath will be found as good as any for this process:—Dissolve and iodise in the usual way thirty-five or forty grains of nitrate of silver for each ounce of water, stir in a very small quantity of bicarbonate of soda to ensure the absence of nitric acid (if the nitrate of silver be alkaline this will be unnecessary), filter, and then render slightly acid with acetic or citric acid. If the latter be used, about two drops of a solution, ten grains to the ounce, will be required for each ounce of the bath, or more if the nitrate be decidedly alkaline.

The bath should be acid enough to redden test-paper immediately. It is better to add too much acid than too little, inasmuch as a slight loss of sensitiveness is better than risk of fogging. If citric acid be used it will probably precipitate some of the iodide of silver; and if so, the solution must be filtered again. Should plates, otherwise properly treated, show the least sign of fogging, more acid must be added. A more acid bath will be required for use with a nearly, or quite, colourless collodion than with a sample coloured with free iodine.

A rather strong bath is better than a weak one when a thick and highly-iodised collodion is employed, and in all cases saves time by exciting more quickly. After the bath is once prepared, if only used for this process, it never need be filtered again, as any sediment which may settle on the surface of the collodion will be removed by the subsequent washing.

The plates are to be coated with collodion and excited in the usual manner, and washed, first in distilled water, and afterwards in common water. The following will be found to be a good way of managing these operations:—Fill two dipping baths with distilled water, and one or more gutta-percha trays, or other convenient vessels, with common water, and place all near the exciting bath. Take up a plate with a pneumatic holder, and rub the surface with the velvet rubber to remove any slightly-adhering particles of dust, turning in such a direction that the slight current of air which exists in almost every room may carry dust away from the place where the plate is to be coated. A common one-ounce, two-ounce, or three-ounce phial, according to the size of the plates, is better than the bottles usually made for the purpose of pouring collodion, since the cork keeps the neck much cleaner than a glass stopper, and prevents the formation of dried or half-dried fragments. Take out the cork, and wipe the rim before commencing. It will be better not to wipe it again while coating plates in rapid succession, care being taken to pour from the same side of the rim every time. The bottle should be kept nearly full, by adding from another bottle every few plates, or any sediment at the bottom will be disturbed. The collodion in the second bottle should be thinner and contain more ether, according to the size of the plates, to allow for evaporation and keep it in the same state. Coat in the usual way, pouring off, by preference, from the same corner on which the glass was drained after being gelatinised, that the thickest part of the collodion may be on the thickest part of the gelatine.

Take the plate off the holder as soon as the collodion has ceased to flow, still keeping that side downwards which was lowest in pouring off, and tilting it at a considerable angle on the edge of the screw-holder, or other convenient place, to prevent the thick edge spreading back on the plate. Touch the thick edge to ascertain when set enough, which is known by its just taking the impression of the finger. The film need not be more set than for the wet process, when gelatine has been used. If the plate be not quickly removed from the holder, the excited film will show a circle of greater transparency where it was attached. This mark is caused by difference of temperature, and the effect is produced very quickly when the glass is thin.

When the film is sufficiently set, immerse in the bath, and give the plate a lateral circular motion for a few seconds, to prevent streaks in the direction of the dip and to hasten the action. Take up another plate on the holder, rub as before, and lay it down until required. After about two minutes lift the plate in and out of the fluid ten or twelve times, until the oily lines disappear; then sweep the next plate gently once or twice with the rubber, coat with collodion, and tilt up to set, as before. Now take the first plate out of the bath, drain the lowest corner for a few seconds against the dipper, and place in the first bath of distilled water. This

operation will usually occupy about as much time as the next plate requires to set: touch the thick edge to ascertain if ready, and immerse in the bath.

Should the temperature be very high, a quickly-setting collodion may not allow of this way of working, the film becoming too dry, as shown, after excitement, by the transparency of the edges which were uppermost when the collodion was poured off. In such a case the first plate must be removed from the bath before the second is coated; but the plan above described will be generally practicable, and saves much time. After the second plate is in the bath, the first is removed from distilled water No. 1 into distilled water No. 2.

Proceed in the same manner throughout—that is, after immersing each plate in the exciting bath, pick up the next and rub the surface; then lift the plates up and down in both distilled water baths a few times; then shift the plate in No. 2 into the common water, and lift the edge of the dish to make the water flow over it. Next remove the plate from No. 1 into No. 2, just made vacant; lift the plate in the nitrate bath till oiliness disappears; cover the next with collodion; and so on till all the plates to be prepared are in the common water, where they may remain for hours without injury.

The distilled water need not be changed until a considerable number of plates have been washed, when the second bath may be substituted for the first, which is then to be emptied and filled with fresh distilled water. If dipping baths are not at hand, horizontal dishes will answer the purpose; and, if large enough to hold several plates, the first dish may be filled before removing each plate in its turn to the second dish. When the second is full, the plates should be placed in the same manner in the common water. The washing in distilled water is necessary when the common water is hard, to prevent violent decomposition of the nitrate by the action of the salts in the hard water, and consequent precipitation and adhesion to the film of insoluble salts of silver. The whole of the above described operations can be conducted whilst the plates are exciting in the bath; and, since a second plate is always put into the bath as soon as the fully sensitised one is taken out, no time is lost. Twelve plates can thus be easily excited and washed in an hour, or in less time if the bath be very strong. The plates prepared for any dry process require a rather longer stay in the exciting bath than would be necessary for the wet process, as in the latter case the action of the nitrate, if not quite complete, will go on after the removal of the plate, the solution being left on the film. The plates should not be less than half an hour in the common water: unless the latter be very unusually pure, the small trace of nitrate left in the film will be entirely removed in that time. Should the water be too pure to precipitate nitrate of silver, it may be used instead of distilled water for the first and second washing baths, and a very small quantity of salt dissolved in it for the third.

After being washed in common water, the plates may be steeped in strong salt and water, if thought desirable, without perceptible alteration of quality in any way, provided the salt be entirely removed. No economy of time, however, results from this mode of working: on the contrary, it takes a longer washing to remove the salt than is required for the nitrate of silver, since the former is acted on only mechanically, the latter chemically as well, by hard water. A very small trace of chloride of sodium remaining in the film will greatly diminish vigour and intensity in the picture.

By the time that six plates have been put into common water the first will be ready to be coated with tannin; but, if as many as a dozen or two are to be prepared, it will be found more convenient to finish one operation before commencing another, and greater security will thereby be afforded against the presence of traces of nitrate, the entire absence of which is of great importance. It will be as well to cover the vessels containing the common water with gutta-percha trays, to keep out light and dust while the excited plates are being washed.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. IX.

Massacres in Lebanon—Cracking of Negatives Cured—No Dry Process—Bethlehem—Rachel's Tomb—Solomon's Pools.

In the latter part of my last article I gave a brief account of a little bit of trouble I got into through having been *supposed* to be taking, without leave, the portraits of the wives of Turkish Pashas and Effendis. Let me now very briefly tell how this little affair ended. In true diplomatic style, no sooner had my complaint been made than a series of long despatches commenced flying between the seraglio and the British Consulate, till in a few weeks, when the Pasha had returned, the thing had become a great grievance, which threatened, before being settled, to reach the ears of Fuad Pasha, at Stamboul, and Her Britannic Majesty's principal Secretary of State for Foreign Affairs, at Downing Street, whoever he might happen to be. While I had every wish for being amply protected against a repetition of the same thing, either to myself or any one else, I could not think of my little grievance being so far magnified as even to travel beyond the officials at Jerusalem, the more particularly that before the case became at all ripe for any settlement more grave matters and more serious outrages, by Turkish subjects, called for the consideration of both Governments. The news of the horrid massacres in the Lebanon had reached Jerusalem, and produced in the minds of the inhabitants very varied and mingled feelings. The native Christians cowered and trembled; the lower order of the Moslems became sullen and insolent. While many of the French Christians could well deny having manifested anything like fear, all were concerned for their own safety and those dear to them.

As I was in Jerusalem during the excitement consequent on the hourly expectation of a repetition of those scenes of bloodshed and plunder which had been enacted in Damascus, and in the prosperous villages of the Lebanon—the mere outline descriptions of which made one's blood run cold—I might have occupied a considerable space in describing the state of feeling in Jerusalem, and what we did to prevent an outbreak, and what provision we made for our defence in the event of such occurring; but, as I wish to bring these papers to a conclusion as soon as possible, I will not do so further than I cannot avoid in order to take my readers in some measure with me on my journey through the country.

With such things to think of I was in no humour to higgle about the amount of compensation I should have for the damage to my "traps," nor how much humiliation I should insist on for the slight personal injury I had received in my encounter with the Pasha's black eunuch. After a lengthened correspondence I went to the Pasha to prosecute my demands; and, after a long discussion of the whole question, I accepted the Pasha's promise that he would severely flog his servant at his earliest convenience. He was brought to me at once and made to kneel and kiss my hands and knees; and I presume I might have been kissed all over if I had had any peculiar relish for the operation. It was not a very great penalty I was exacting, but, under the circumstances which I have referred to above, I was glad to get done with it in any way that seemed like being victorious.

In the last number of my "Palestine" I promised to give an account of my visit to Bethlehem in this number, and, in connexion with it, to tell how I got over the difficulty of my pictures cracking. I had never seen an albumen negative crack in drying before. My views from Olivet, which had cracked, I was sure had acquired the tendency to do so after being silvered; but *what* it was that did it—not *when*—was the main question.

On my return from a visit to Bethlehem, I saw at a glance the *exact* when; and, by knowing that, I also was led to the discovery of the cause of the trouble.

On taking out one of my plates from the slide I found that the film had not only cracked, but had peeled off entirely in many places. I examined the slide, and found it intensely dry. This I at once concluded was the cause. An albumen film will not do to be perfectly dry. I was confirmed in my conclusion that the dryness of the slide was the cause by remembering that my small or stereo. plates had never so split off or cracked. If my readers will look at my stereo. camera, in page 265 of this Journal, they will see that the prepared plates are never brought near any wooden surface, but lie most of the time, from preparation to development, in a box with other similar plates against them: they thus remain very much in the same state as when we put them in. If dry, they will keep so; if damp, they will so remain. The cure for this evil was evident and simple enough, if my conclusion in regard to the cause were correct. I put my slides in water, wetting every part well and frequently; and I never had a recurrence of cracking in my negatives afterwards. From my experience in the last and some experiments I have since made, I believe the title "dry process" to be a misnomer. There is no dry process. I believe no picture can be taken without the presence of moisture; and I am quite sure I can easily make the materials for producing pictures so dry that only the most miserable result will be obtainable. I would, however, rather give the result of experiments on this question in a separate form.

Persons who have never been in such a climate as that of the higher parts of Palestine have no idea how dry the air is, and how dry things daily exposed to it become. The driest day of the driest summer we ever have can give but the faintest idea of the ordinary condition of the atmosphere in Jerusalem. And yet a large amount of water falls there every year too; but it does so pretty much at once, and not during the whole year, as in some parts of this country, where one would almost be led to the conclusion that the normal condition is that of rain. I believe about eighty inches of water fall every year in Jerusalem, or rather more than three times the amount that falls in Glasgow, where there are upwards of *two hundred* rainy days in each year. There is no rain for eight months in Palestine. I did not see a drop of it from the day I set foot in it till I embarked again—some five months nearly. Is it not a glorious country? The land chosen of God for His own peculiar people is indeed one favoured of nature. Why is it a wilderness and a desolation, trodden down by the Gentile? How long will it be so? These are questions that arise in the mind of every thoughtful student and every traveller in these lands.

My instructions required me to take views of Bethlehem and Hebron, and several objects of biblical interest lying near the road to these places. Hebron is about seven and a-half hours' ride from Jerusalem—Bethlehem is less than two hours. The true distance is scarcely in that relation—at any rate, as set down in the maps. About an hour beyond Bethlehem, toward Hebron, are Solomon's Pools, and between Jerusalem and Bethlehem is Rachel's Tomb. Both of these I wished to photograph. After a good deal of consideration, I determined on doing Bethlehem, Solomon's Pools, and Rachel's Tomb, by themselves in one trip, as I could go and return in one day from the Holy City, while extending the journey to Hebron would require three days, and necessitate more baggage. I could afterwards go to Hebron, and return, only requiring to be one night from my home in Jerusalem.

Leaving pretty early, by the Jaffa Gate, we cross the valley of Gihon, and soon scamper over the plain of Rephaim. Arriving at Mar Elias we lose sight of the Holy City, but soon exchange for it the view of Bethlehem in the distance. Tradition has located some important scriptural events here, and the pious feeling of many nations invests this place with holy interest. Personally I do not believe the tradition to be *true*—unbroken; and, therefore, I do not believe that the impression of the elbow of the prophet Elijah is on that stone so many are pleased to bow before. Nor can I drink the water of that well in the belief that the "wise men" really saw the star mirrored in its surface, and were thus encouraged to prosecute their journey, and were guided to the goal of their desire on yon hill side, where now, whitening in the morning sun, is seen the Church and Convent of the Nativity; but which I *do* believe marks the true site of the birth of our Lord. The tone in which some Protestant travellers in the Holy Land speak and write of the traditional sites of the holy places is, I think, much to be regretted—dismissing this or that place with the curt phrase, "a monkish tradition"—and pointing to this or the other as so and so. What do we know except by tradition? and what knowledge is better? Ten thousand thanks to the monks for preserving the traditions they *got!* and the pity of one who respects them much for the good they did, that they ever tried to add to the traditions they received by now and then drawing on imagination a little.

Soon after passing Mar Elias we sight the tomb of Rachel—a holy place, alike respected by Moslem, Christian, and Jew. There, as we approach it, some twenty or thirty Jews—all ages, young and grey-headed and of both sexes—have arrived and are entering to go through their devotions. Very earnest and reverential they look. I soon unpack my camera: I take two pair of stereos. and an 8 by 10, repack, and am on my way again in twenty-five minutes: no time lost in that operation, at any rate! A little farther on, and I determine on having a view of the City of Bethlehem, with the Church and Convent of the Nativity. It will not do then—the light is quite off it: I will take it as I return. Meantime, I go over the ridge on which the city stands, and take a view from the other side. It has the advantage of including the whole city (which the other will not do, unless in three views) except the site of the Nativity. The exception is fatal to the interest of the view. The other view from the east would just be rendered properly with a panoramic lens, as there is one point from which the view must be done, and from it the ordinary lens would require three views. I was soon again on the way to Solomon's Pools, walking our horses on the track of the aqueduct from these royal water-works. Who would not think of it! These reservoirs, the same that, three thousand years ago, supplied the capital of Solomon's kingdom with water, are there before us, and a pilgrim from a far distant land is there to carry its sun-made picture to his island home! The Pools are three in number. They are of considerable size, and are in a very good state of preservation. The channel leading from them to the Holy City is still quite entire. I took two pictures of both sizes, and returned by another way to Bethlehem, where I arrived early in the afternoon—too early to take the view I proposed. I spent the time I had thus to spare in examining the interior of the Convent and Church of the Nativity.

CHLORIC ACID IN THE SILVER BATH.*

By M. Mc-A. Gaudin.

In order that a silver bath should work well with all developers it is needful that it should be acid, but in the smallest degree possible.

I have already shown how much the acid at present employed—that is to say, acetic and nitric acids—give variable results, owing to their volatility and to their decomposition in presence of etherial compounds which form in the silver bath under the influence of temperature. It is this which has induced me to make trial of a fixed and stable acid, unable, in any case, to produce a precipitate.

In this category chloric acid occupies the first rank. All the chlorates are equally soluble with the nitrates, and, if once the bath be acidulated by chloric acid to a convenient extent, it will preserve always the same acidity in spite of the concentration of the bath or even of its entire dessiccation.

Chloric acid is prepared by means of chlorate of barytes which is made for the use of certain artificers. This salt is very expensive, being worth about forty francs per kilogramme; but so small a quantity of chloric acid is needed that the consideration of price may be disregarded.

After having made a saturated solution of chlorate of barytes, sulphuric acid is added until the precipitate of sulphate of barytes which is formed ceases to fall: the solution left is chloric acid diluted sufficiently for use.

After having prepared a neutral silver bath I used it for the production of proofs developed with the pyrogallic acid, strongly acidulated, which I usually employ. After the addition of ten drops (of the chloric acid) to each litre, the silver bath reddened litmus-paper very decidedly, and the proofs obtained with this modified bath appeared after exactly the same length of exposure. I then increased the quantity of dilute chloric acid to five per cent. of the volume of the silver bath, when a very marked dimunition of sensitiveness became apparent; but infinitely less so than if I had added dilute nitric acid in like proportion.

The dimunition of sensitiveness appeared to me altogether comparable to that produced by acetic acid; and that is why I asserted that dilute chloric acid ought to be the best agent for acidulating silver baths.

* From *La Lumiere*.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. IX.

DISTORTION.

In the practice of every art it is necessary for all persons to follow certain rules or methods, and to make use of the experience and knowledge published by others, if they wish to obtain the best and most correct results—to compare with the works of first-rate operators. So it is with photography; and yet, hitherto, there have been no rules by which to go, on certain points, that I am aware of—or, at least, I have not seen any promulgated publicly—for instance, in relation to taking pictures in such a manner that when viewed in the usual way they will appear correct in perspective. This is a want I will endeavour to supply. It has frequently been asked whether long or short focus lenses are the best—that is, in regard to causing distortion or freedom from it. I will try to answer that question.

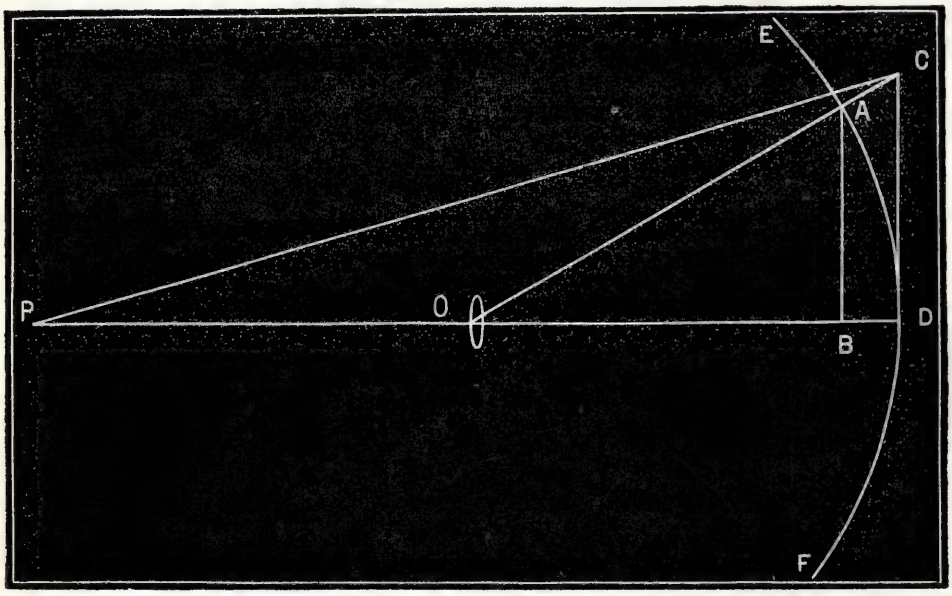
Every picture intended to be viewed by the naked eye ought to be taken with a lens whose focal length is *not less* than ten or twelve inches, because small pictures are generally held about that distance from the eyes when being looked at; or, rather, the eye ought to be at such a point on the axis that if the directions of the pencils, on striking the plate, be traced backwards, they will cut the axis at the position of the eye; for, if the distance at which pictures are viewed always equalled the focal length, it is certain their perspective would not appear correct, because it is not the

focal length alone which determines that matter, but the focal length and the position of the diaphragm together. If the stop be in contact with the lens, the view-distance and focal length must be equal; but if the stop were some distance in front of the lens, the view-distance would be greater than the focal length, and also longer than the distance of the stop from the picture, because the lens would cause the pencils to deviate in such a manner that, if traced backwards, they would cut the axis at a point in *front* of the stop, which point would be the correct position for the eye.

On the contrary, if the stop were behind the lens, the view-distance would be shorter than the focal length; for the pencils, if traced backwards, would cut the axis at the aperture of the stop, which would be the right position for the eye. Thus, in one case, if the stop were in front the focal length should be less, and if it were behind greater, than twelve inches. For brevity and perspicuity I will call the *right* position of the eye "the view-point," an explanation of which I have given above.

In my last paper I showed that if a picture be looked at from the "view-point," it is immaterial whether the picture be taken on a spherical or flat surface, for in both cases it will appear correct.

FIG. 3.



In *Fig.* 3, O is the lens, E F the spherical surface, and C D the plate, or rather half of the plate. For both pictures to appear correct

sine A B : tang. C D :: cos. O B : rad. O D,

because O A B and O C D are similar triangles. Now, if we look at the two pictures from any other point, say from P, the similarity of the triangles is destroyed, and, consequently, the proportions of the sine and tangent and sides are altered. The pictures, therefore, are dissimilar and out of proportion; for, looking from P along the straight line P C, at C, the top of the picture on the flat plate, it is very evident the line P C does not touch A, the top of the spherical picture, but goes above it, in consequence of which we see the upper portion of D C apparently enlarged or distended. It will be noticed here that I use the sine A B instead of the arc A D, because they both subtend the same angle; and, if a picture were taken on A B, it would appear of the same size as A D. Without any further demonstration it will readily be seen that, as the width of the field of view is increased, the disproportion betwixt the sine and tangent becomes greater (that is, when viewed from P), and, therefore, the distortion, or incorrect perspective, more obnoxious. But, with a lens of 12-inch focus and upwards, any width of field may be included, and yet the perspective be rigorously exact.

In taking, with a short focus lens, a view of a street, railway, tunnel, colonnade, series of arches, crystal palace, or any subject which extends a long distance straight in front, the near portions, being in the margin, seem too large—too much stretched out, as it were—while the distant parts, being in the centre, appear contracted—too much diminished—something like looking into a bell instead of a cylinder. And so it is in reality; but, if the eye look at it from the proper view-point, all then appears right—that is, if the eye can see clearly at a sufficiently short distance; or if it be looked at through the centre of a lens of proper focus, by which the pencils are not caused to deviate. The bad effect is more perceptible in subjects of the above description than in a general view or landscape; but, even in a landscape bounded by distant hills, those hills appear much too small.

It has been asserted publicly that the evil is caused by the *power* of a lens, the meaning of which I take to be this:—That pencils from a near object come to a focus at a point farther from the lens than those do which come from a distant object; therefore the image of the near object will be larger and that of the distant one smaller than what they ought to be. If that is what is meant it is a fallacy. Under those conditions it is not the difference alone of the conjugate focal lengths which determine the sizes of the images, but the angles which bound the images; for in focussing, and to get the best average definition, the plate will be between the two focal points, the effect of which will be to reduce the size of the image of the near object and enlarge that of the distant one, producing an effect similar to that of the eye in adjusting itself to bring either near or distant objects in proper focus on the retina—that is, having equal focal lengths for all objects.

If any of the above subjects were photographed with their line of direction oblique to the plate, similar effects would occur to those referred to in my last paper, viz., when the plate was inclined to the perpendicular, or horizontal parallel direction, the distant parts would be too much diminished and the near ones too much distended; and what effected a cure in one case would do so in the other—that is, the plate must be, if not parallel to the line of direction, at least in such a position of inclination as to rectify the incorrect perspective, which can be done by the "track of the eye," or by a little judgment. In my paper, read before the London Photographic Society, I there accounted for one kind of incorrect perspective by an optical illusion, and which, I think, will be applicable in further elucidating the points touched upon in this article.

Portraits are always more correct, as regards having less distortion, when taken with a long focus than with a short one. A twelve-inch focus will take a more correct portrait than a six or eight-inch on the same size of plate; but, supposing the lenses to be equally good, a short focus must give finer definition than a long one.

As a *resumé* of what I have now stated on this subject, I will just state the conditions which must be attended to by which to obtain the most correct results. The lens ought to be such an one as gives straight lines all over the picture. The best position of the plate is that in which it is vertical, or as near it as can be, when taking a vertical object. When taking oblique horizontal objects, the position of the plates for securing the best perspective must be ascertained by experiment in varying the inclination while focussing.

The focal length of the lens, whether for portraits or views, should never be less than ten or twelve inches, except for stereoscopic views, or such as are to be viewed by short-focus lenses.

If these conditions are fulfilled, I conceive a superior class of pictures will be produced; and, if so, my writing will not have been in vain, and I shall have the satisfaction of having contributed my mite, however small, to the improvement of photography.

LEAVES FROM THE DIARY OF A LATE ENTHUSIASTIC AMATEUR.

Edited by Sydney Sunshine.

If you are not remarkable for anything—if you have never performed any remarkable feat—been the hero of any exciting breath-suspending adventures—or have not any brains, dear reader, then wear a remarkable hat. You may, perhaps, be mistaken for a distinguished *savant*, or a conspirator! This is only another form of humbug; but humbug is one of the mighty potentates whom all men decry and all men worship!—verily an uncrowned, but not an unthroned monarch to be met at mart, exchange, at homes, scientific *soirée* and *conversuzione*, or any of the multitudinous places where people meet to play at *make believe*. Only take care not to practice the most dangerous form of it, and humbug yourself—lay flattering unction to your soul, and hug fond delusions, which by and by must have hideous awakenings. Never imagine, too, that the light of genius is stamped on your brow, to be read by all men; or that your presence, in combination with a camera, will command the respect of the great unwashed.

Shall I ever forget the lineaments of the simple-looking benevo-

lent old gentleman I met when I was getting that beautiful distant view which graces the 39th page of Augustina's album? How attentively he watched me from the foot of the mound, or gentle eminence, from which I took it; and, as I shouldered my camera to descend, begged with blandest condescension that I would not trouble myself to bring my "show-box" down! "Don't trouble yourself, my good man, to come down to me, I'll come up to you"—thinking I had something to exhibit of a nature akin to telescopic peeps at the moon, at one penny per head—or eye. How he toiled up the ascent, wiping the dew from his forehead with the yellowest of yellow bandannas! How I gratified him by a peep under the focussing cloth at the churches and chapels bottom upwards! How my ruffled dignity chafed the while! Did *I* look like a mountebank? And, as I stroked my hirsute appendages, I felt an almost irresistable desire to knock his old pate through the focussing glass; but a nobler form of revenge suggested itself to my mind. I would take him at his word, and have my "wager." Did any of my readers ever see Robson eat an ice—or even give away a sovereign, meaning only a shilling? Can any *simile* call up the look of blank dismay depicted in his face when I demanded nothing less than half-a-crown? The loneliness of the spot and my ferocious beard and glittering eye quickly extracted the unwilling coin, and old Rusticus moved off, visibly a sadder if not a wiser man. With what pleasure I dropped it in the hat of the old soldier who opened the gate for me at the bottom of the meadow, under the wood; and what extra pipes of Cavendish and draughts of nut-brown ale it brought him!

Growing desirous of extending my operations, and to save myself from such annoyances in future, I promoted a rustic hanger-on of the family to be my *aide-de-camp*, commissary-general, and quarter-master, all in one—besides being the servant of the servant of servants, as an International Exhibition Commissioner would say.

An original pattern of a man was Joe Strawberry—not a servile copy of any one else in existence; and he possessed, according to Combe, a strongly-marked individuality of the most comical kind. Joe had long been my self-constituted "help," and was often heard to boast in the servant's hall of *our* achievements, and the wonderful things *we* had done; for Joe's unsophisticated mind could not understand any principle, other than that if he shared the labours, he must the laurels also, and was very tenacious of any dissolution of partnership on that head. Many scrapes did poor Joe get into and through. Many more did he get me into, and not through. Thou wert a faithful scamp, Joe!—though, like thy compeers, not unmindful of small change, or always mindful of the laws of *meum* and *tuum*. Many another have I seen since—sycophants, who did the skinning process more tenderly—yet I cherish thy memory with feelings of solicitude and regret.

How happily he would lie on the grass and mind the camera, whistling the while; or stretch himself out "full length" in imitation of the pose of Coreggio's *Madonna*, and producing from his capacious pockets a penny *Telegraph* or *Morning Star*—which he always continued to exchange (*accidentally*) for a newer one at every inn in which he stayed—would proceed to leisurely spell his way through those great public questions addressed point-blank to the reader personally, and whose notes of interrogation thrust themselves in our face at every breakfast table, soliloquising somewhat in this style:—"Do—you—want—luxurious—hair—and—whiskers?" "Shouldn't I!!!" and he would run his fingers through one of the most cross-grained, ill-tempered, ill-conditioned of old scratches that grew in all different directions, and could never be brushed into shape, looking like nothing under heaven save the husk of a hedgehog. "Luxurious hair and whiskers!" and his eyes would twinkle as he thought of a deity blooming in Farmer Stubbs's dairy, at whose shrine he had long worshipped in vain. This would be followed by "Who's your tailor?" "Do you think of getting married?" "What kind folks they are up in Lunnun!" Joe would say, believing in the simplicity of his heart they were really benevolent inquiries, and not that an insidious design on his breeches' pockets lurked beneath the friendly inquiry.

One day J. S. returned from the village, near which I was temporarily sojourning for the purpose of photographing some of the beautiful scenery around, evidently fresh from a direful fray. As he was still in a state of effervesence it was some time ere I could elicit all the details of the case, which happened somewhat in this wise:—An itinerant painter of sign-boards—and, as he himself expressed it, of "almost any mortal thing" beside—whom we had seen once or twice before in our wanderings, was painting a new sign-board for the village ale-house, known as "The Sow and Pigs." Joe, who had been lounging about—it being a dull morning—ventured to find some fault with the drawing—the foreshortening of the sow's leg and the unnatural colour of some of the little ones, to which the knight of the brush replied with the inquiry—"What do you know about it?" "If I don't understand pigs I don't know who does," said Joe, "for I've been brought up among 'em all my life."

Mr. Paint-pot retorted with some reflections of a personal nature on the other machine, and his "barrel-organ art, concluding with an ambitious attempt to smash his opponent by another interrogation, begging to know what he knew about "'igh art?"—to which Joe replied, "That it wos a werry good job for him it wos 'igh art, cos if it wasn't hung so 'igh folks would see what stuff it wos!" This led to an appeal to arms, and a regular scrimmage ensued, in which Joe painted both his eyes in natural colours, one black and the other blue, without the aid of brushes or pigments.

It was many days ere Joe "settled down," and was evidently often in imagination "fighting his battle o'er again," dating everything for some time after from "the day he thrashed the painter." Joe had an entirely original and eccentric method as to the division of time, and scorned the commonplace of ordinary mortals. Thus his life was a series of epochs, each event serving as a fresh starting point, to be in its turn displaced by another and more recent one.

The neighbourhood was not a favourable one for photographic pursuits. On one occasion we were rather scurvily treated by a village squire, who imagined we were practising some illicit method of extracting the fish from his streams, and threatened to knock our "box" into the waters. This being followed a day or two after by Joe's getting impounded for stealing a wheelbarrow to "make up" the foreground of a picture, decided me on breaking camp and seeking fresh fields and pastures new.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

SUBORDINATION *(continued)*—THE POWER AND VALUE OF JUDICIOUS CONTRASTS IN TONE AND INTENSITY—THE DANGER OF SUCH POWER BEING MISUSED—KEEPING DOWN OR CARRYING BACK—ROBINSON'S METHOD—REJLANDER'S METHOD—GLAZING—A HINT FOR THE LANDSCAPE PHOTOGRAPHER AND OTHERS—PROPORTION—TRUTHFULNESS—EXACTNESS.

"The difficulty lies in distinguishing and preserving a proper pre-eminence and *subordination*."—*Lodovico Dolce* on Painting*, 1530.

"The principal figure of the subject must appear in the midst of the picture, under the principal light, to distinguish it from the rest, which are only its attendants. Thus, in tragedy, or an epic poem, the hero of the piece must be advanced foremost to the view of the reader or spectator: he must outshine the rest of all the characters, like the sun of the Copernican system, encompassed with less noble planets."—*Dryden's "Parallel of Poetry and Painting,"* 1750.

"Every part must be considered with reference to the rest, and to the unity of the whole."—*H. Howard, R.A.*, 1848.

MY DEAR FELLOW-STUDENT,

The above dates will suffice to show you that this law of *subordination* has at least the weight and respectability of age to recommend it to your attention. I might have easily hunted up quotations which would have dated back to an earlier period; but having in my last endeavoured to show the necessity and importance of such a law, the mere enumeration of authorities by whom it has been announced is not of so much importance. My difficulty indeed would rather have been to find any authority by whom the importance of subordinatiou has been denied or even doubted. But let us return to our subject, resuming from the point we had reached in my last.

You now perceive why the subordinate parts of your picture should be neither black nor white. You also see that, as white may become more luminous and black acquire depth by contrast one with another, contrasted white is more *prominent* than white without contrast, and contrasted black has more *prominence* than a black associated with kindred tones. If, therefore, we desire to give prominence to a white object we contrast it with darker tones, or with black, as the case may require; or should we desire to give black more prominence we contrast it with the lighter tones or with white. But there is another element of contrast which to the artist-*photographer* who cannot always get the natural *chiaroscuro* exactly as he would have it, is very valuable, viz., that

* Carlo Marratti said he attained his great knowledge of pictorial principles "by studying *Dolce*."

which arises from contrasting white in light with black in shadow; for we thus obtain sufficient force to keep back either pure white or pure black. One of the most expeditious methods of securing such a focus of intensity is by so posing two figures, one in light and one in dark drapery, that the first being placed in direct light throws its shadow upon the second. All this doubtless seems very simple, but all this is nevertheless very frequently overlooked, especially by those who are ignorant of its importance.

But I must not omit reminding you that, while explaining the power you have in the use of such contrasts, that power is very easily abused; and you must also remember that many other considerations should be received before the above methods are adopted. For instance, in every picture you produce there is a point which indicates the position of the artist's eye or lens, and its "focus," to which point the spectator's attention should be at once carried, in order that the full effect of the whole may be properly felt and understood. When, therefore, some attractive or prominent focus of light and dark is introduced for the sake of subordination, its situation should either represent this focus itself, or lead the eye cunningly towards it, just as it does in the photograph of *Early Spring*. I need hardly point out that in one picture such points of contrast must never be numerous, bring *one* out prominently and it will keep in check a host of minor lights and shades;* but that one has a right and a wrong place: it should always be near the centre of the picture, and while doing its work by subduing its neighbours, it must neither lead the spectator's eye away from the picture's focus, nor produce that "spotty" effect which is, as I shall show more fully anon, destructive of pictorial "*breadth*."

I have at present only spoken of "bringing forward;" if, however, we desire to "*keep down*" or "*carry back*," we must either select a view of our subject which will leave the parts requiring such treatment without any forcible contrasts of tone, or wait until a change in the direction of the light alters the *chiaroscuro* of the scene itself; or we must destroy the prominency of the objectionable parts by getting in their vicinity contrasts of a still more forcible character, just as we perceived all the little points of contrasted white scattered over Mr. Robinson's picture, as described in my last epistle, were kept down or thrown back by the vigorously given focus of intense black and white in the girl's drapery. But if the effect we require is not to be got by any of these means, we need not despair; for is not *Rejlander's* after-method of *glazing* with the sunbeam still within our reach? In explanation of this method I cannot do better than use, as nearly as I can remember them, Rejlander's own words:—

"I cover up," says he, "some parts of the picture, and use a few *rays* and PENCILS of light just to glaze over this group, and, using them a little more freely on more retiring figures, I thank them and cover these up. Then I bid my rays and pencils paint me the background behind them; * * * and then uncovering another group I bid the light sink this or that figure deeper in the shade; * * * but," adds he, "because such agents as I use work quickly, I must ply them fast and guide them well lest there should be marks from my *brush*."

This process is exactly that which the painter calls "glazing," and answers a precisely similar purpose in keeping down or throwing back such parts as are otherwise, from their peculiar arrangement of tones, too prominent. It is not absolutely mechanical, since it requires no little artistic knowledge in the operator, and it is, therefore, a process very likely to be denounced by those who think photography has no right to be used as a fine art. If you can do without it, do; but it is no less legitimate in your art than in that of painting, and, though in either case it may fail, for such failure the photographer or painter only should be blamed.

Had you not already abandoned the pernicious "*white skies*" *(?)* once so common an eye-sore in our photographs, I should here show that subordination can have no existence in the presence of these huge, glaringly-prominent, and unnatural masses of flat white paper, which, usurping the place of the skies' beautiful and retiring gradations, stare every spectator into disgust with their blank, unmeaning spaces. I see no reason why variously-graduated papers should not be prepared, with tones closely assimilating to those of photography, upon which landscape pictures might be printed with very excellent artistic effect. By their use subordination would be greatly aided, because the staring little patches of contrasted white now so common in photographs would necessarily be subdued and softened. The effects of light and shade in such might be varied, *ad lib.*, to suit the sentiment or other pictorial demands of the different subjects. A similar effect might also be obtained by getting a clever landscape artist, with thin and frequently-repeated washes of Indian-ink, to produce the effects you desire, and by them obtaining a negative from his production, to be used in the printing. Such methods would, I am sure, be very preferable to that of under-exposing, and thereby frequently completely destroying the brilliancy, vigour, and beauty of the landscape itself, for the sake of obtaining what is most frequently an equally imperfect sky. Where the sky can be skilfully printed in from a second negative, I prefer it; but, as the subjects in which we can thus use a good sky negative are "few and far between," there is a large field for graduated printing papers.

We have now duly considered subordination both in reference to atmospherical truth and to the uses of black and white, or the two opposite extremes which they technically represent. We will next consider this branch of our studies with reference to PROPORTION.

A good architectural perspective representation of an edifice gives the minutest detail of the ornamental mouldings and decorations that it is possible for manual mechanical skill to delineate, but where these cannot be described in *their exact relative proportions* to the size of the building of which they are parts, they are wisely *omitted*—otherwise an appearance would be presented as untrue to architectural science as distasteful to the eye of the artist. Subordination in landscape art demands the same degree of *truthfulness;* for just as the indication of any part of an edifice as larger than its true proportionate size would altogether vitiate and alter the character of the building, so an injudicious attempt to imitate the minute details of objects in the vast theatre of Nature on a surface of a few inches or feet in extent must be displeasing to the refined judgment and taste of every educated observer.

It is clearly an impossibility to represent distinctly such minute parts as leaves, grass, herbage, and other similar objects of the natural landscape in *due proportion* to the scale of the whole scene without falsifying the actual appearance of the whole, in which case exactness is merely nominal, and the picture is no more a correct representation of Nature than a portrait in which the relative proportions of the features were utterly disregarded would be a correct likeness because some particular but partial truths of form were still preserved. Now, when such portions of the landscape are delineated thus disproportionably, they will infallibly so obtrude upon the attention that the unthinking or ignorant spectator will feel puzzled by the singular combination of *exactness* and *untruthfulness* thus presented to his eye. The absence of subordination in proportion being more readily felt than accounted for in this (to such a spectator) apparent paradox.

It is for this reason that the painter indicates such minuteness of scenery with a few significant touches, omitting rather than magnifying, just as the architectural draughtsman would in the above case.

As I have just received a note stating that my matter is now due at Liverpool, my dear Fellow-Student must permit me to lay down the pen and resume the subject in my next letter.—Till when, I am his, very faithfully, ALFRED H. WALL.

* "A very little black will throw the whole picture into light and relief, while too much will be destructive of tone."—*Ruskin.*

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE first meeting of the season of this Society was held on Thursday evening last, the 10th instant, at St. Peter's School Room, Walworth. Sebastian Davis, Esq., occupied the chair.

The minutes of the previous meeting were read and confirmed.

The CHAIRMAN, in opening the session, said he had not the pleasure of calling attention to any important event which had happened in the photographic world during the recess. The upholders of artistic photography had not had their hopes of getting the Royal Commissioners to alter the classification realised. Photography was an art-medium peculiar to itself—an art closely associated with, and indeed the offspring of, science. With regard to the ensuing session of the scientific department of the Society, he hoped that individuals would furnish the results of their own practical experiments, and that those experiments would be directed to instantaneous photography. Artistic photography much depended on this: moving objects, foliage, &c. could never be perfectly delineated until they worked with instantaneity. They should then excel artists as much in perfect delineation as they do photographers in colour. The progress of the art depended much upon this, and they ought not to rest satisfied until they could reflect objects with the same accuracy as they reflect themselves upon our vision.

Mr. HUGHES then read a paper entitled *The International Exhibition of 1862.* [See page 359.]

The CHAIRMAN wished the members present would express some opinion upon the sentiments put forth in Mr. Hughes's paper. Perhaps Mr. Wall would make some remarks.

Mr. WALL stated that some steps had been taken, which, if approved by the meeting, should be at once acted upon.

Mr. HOWARD until now had not had the unfortunate position in which photography stood so forcibly brought before his mind. He presumed matters stood thus:—The responsibility of the interests of photography had been refused by the Parent Society: the time of application for space had expired. The only course then open was to memorialise the Commissioners to accept of the services of a number of the leading men and others, and to be urged to make a selection from a body of gentlemen nominated for that purpose. Had the South London Society possessed sufficient negatives they would perhaps have contributed to the Exhibition as a Society; but the question was, of course, not of so much interest to them as to professional men.

Mr. WALL thought he must demur to one remark of Mr. Howard's. He thought the question was not of less interest to amateurs. The attention of professional men was more directed to the £ *s. d.* feature. Amateurs did everything out of sheer love of the art, and he knew that they could, and hoped that they would, exhibit largely.

Mr. HOWARD meant that amateurs had not the stock of plates which professional men possessed, and that they alone could hardly make a show that would be at all recognised.

Mr. WHARTON SIMPSON begged to say that Mr. Howard and Mr. Hughes had mistaken the position photography was to hold. They were still to have a separate department, and not be thrust into the mechanical one. The main question now was how that should be managed, so as to make the Exhibition a worthy one. If the Parent Society had acceded to this, no doubt satisfactory arrangements would ultimately have been made; but, as it now stood, the Royal Commissioners were thrown on their own resources. If they memorialised them, and stated their willinguess to co-operate with them, though they felt aggrieved, and protested against the position awarded to them, they would probably be glad to do so. After all, they (the Commissioners) should, perhaps, be exonerated from blame. It was not for them to decide on the position of photography, but to take things as they found them. The Royal Academy did not recognise it as a fine art, and the Commissioners could not, therefore, accept it as such. The concession of a separate department was like throwing out a challenge to prove whether it was such or not. It was important that the interest should be kept up, and the classifying of the pictures entrusted to worthy hands. As it was, it now rested upon one man, and the responsibility was too much for any one man, however talented. He hoped it would be confided, without delay, to a body of men trusted by photographers, and that the members would resolve to send a memorial at once.

Mr. WALL said he would take the liberty of reading the composition which had been drawn up.

The following Memorial was then read:—

The Memorial of the South London Photographic Society to Her Majesty's Commissioners for the International Exhibition of 1862.

THE South London Photographic Society having noticed with concern that notwithstanding the season for successful photographic operations is drawing to a close, and the period of the International Exhibition is rapidly approaching, no regulations or instructions for the guidance of photographers have yet been published, nor has any committee or list of gentlemen to whom the arrangements for controlling this department have been entrusted been announced. The South London Photographic Society had hoped at their last meeting that the negotiations then pending between Her Majesty's Commissioners and the London Photographic Society would have terminated in the appointment of a committee; but such negotiations having unhappily failed in producing this result, the South London Photographic Society take the opportunity at this their first meeting after the summer recess of expressing their approval of the decision of Her Majesty's Commissioners as regards the separate department promised to photography, and of respectfully representing the importance of the following considerations:—

That a committee of gentlemen familiar with and interested in photography, and of well-known attainments in connexion with the Art, should be appointed and announced to photographers as having the direction and control of the Photographic Department.

Photography comprehending, as it does, various and distinct departments, such as illustrate its scientific progress and its various artistic and economic applications in portraiture, landscape, architecture, astronomy, magnetism, meteorology, physiology, psychology, and many other departments, and a proper arrangement of all these departments depending on technical familiarity with the Art generally, renders the appointment of such committee of vital importance.

That to secure a successful representation of the Art, a comprehensive plan of arrangements should be devised and published, in order that photographers may, in their preparations for contributing, conform thereto, and so co-operate in the production of a successful result honourable to this country.

That whilst many other important considerations, in connexion with this subject, crowd on the mind of the memorialists, they do not deem it prudent here to trouble Her Majesty's Commissioners with questions of detail. But beg once more to press upon their attention that the successful issue of this department of the Exhibition depends almost entirely upon the decisions which shall be now made and published regarding it.

The South London Photographic Society, in conclusion, beg to tender such service as they may be able to contribute to aid Her Majesty's Commissioners in carrying out any decisions at which they may arrive in relation to this important subject.

Mr. SIMPSON thought that, at the last meeting, while wishing to strengthen the hands of the Parent Society, it was not supposed that it was the intention of any one individually to allow the period allotted to pass away, though protesting against the classification.

Mr. HOWARD was glad that photography would have a separate department, where they could depend on their own merits; and he thought that steps should be at once taken, and that the Secretary should be requested to forward the Memorial.

The CHAIRMAN, in putting the resolution to the meeting, hoped the charge of the arrangements might thus be put into the hands of gentlemen competent for the task, and they should not then have the humiliation of seeing pictures hung which were "unequal to the occasion," and others which were good excluded for want of room.

The resolution was carried unanimously.

Mr. HUGHES then said that the resolution to send the Memorial having been passed, and that it would be presented to Her Majesty's Commissioners, he thought they would be pleased to accede to it. As those who ought had thought fit to retire, it gave them an opportunity of relieving themselves; and, unless some one took the charge, the sappers and miners, of whose extraordinary doings they heard so much, would, doubtless, have the whole committed to their tender mercies, and photographers would, by the aid of red tape, be "tied up," in consequence of their having neglected to do anything but find fault.

Mr. CLARKE then read a short paper *On the Photogenic Action of Colour*.

An interesting discussion took place between Messrs. HUGHES, SIMPSON, and DAVIS, relating to the real value of the addition of bromides to collodion.

Mr. HUGHES advised Mr. Clarke to go over the ground again more carefully, and recommended iodising with cadmium, and nothing else.

Mr. DAVIS had always found that collodion iodised with cadmium improved with keeping, and then the addition of iodide of potassium rendered it very sensitive and perfect.

Mr. HOWARD was of opinion that he (Mr. Clarke) should have tried the complementary colours first.

Mr. HUGHES thought that Mr. Clarke was on the right track in trying the primary colours first.

Mr. G. W. SIMPSON, in conveying the thanks of the society to Mr. Clarke, wished that gentleman to try again, and begin at the beginning—to carry out Mr. Hughes's suggestions—to try iron, and also pyro-developers, and the Experimental Committee would lend their aid. The subject, he said, was one of the highest importance.

The thanks of the meeting were then voted to Mr. Hughes for his paper; also to Mr. Blanchard, for two very fine interiors contributed to the Society's portfolio.

Mr. WALL exhibited a fine portrait in oils, enlarged from a *carte de visite* to life size—a graceful portrait, combining the charm of colour and the verisimilitude of the photograph.

The meeting then separated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Wednesday, the 2nd instant,—Professor Williamson, F.R.S., in the chair.

Mr. William Railton was elected a member of the Society.

The SECRETARY then read the following

ANNUAL REPORT.

THE Council of the Manchester Photographic Society feel much pleasure in being able to show by their Annual Report a prosperous statement of affairs.

The Treasurer's Account exhibits a balance of £51 15s. 8d. in hand.

There has been a considerable increase in the number of members—an addition to the Society, however, of far greater advantage than the numerical value, including as it does the names of many who are energetic followers of their art, and who add materially to the vigour with which the discussions are conducted.

The meetings of the Society have been well attended, and the policy of continuing them throughout the year has been fully confirmed. The matter brought forward in papers and discussions has been valuable and interesting, and the whole business has been conducted without that ill feeling and jealousy which too frequently exist in such societies—the object of every one having been to impart all the information he could to his brother members, and to promote the general interests of the Society.

In reviewing the progress of photography during the past year no discovery of singular importance presents itself; but its progress by imperceptible steps has been sure and considerable. Photographers now are feeling their way into the realms of art, and are learning that success does not depend upon the number of pictures obtained, but upon the production of something which will bear the criticism of the artist as well as the examination of the photographer. The pure white skies which were once so desired have now given place to something more artistic; and a general harmony in composition is observable, which gives rise to the remark that photographs are becoming "more like pictures."

Photographic printing may now be said to occupy a proper basis. So well do we understand the signs of fading that we can predicate with tolerable certainty the fate of even a recently-produced print, and can say by which process it has been toned. The photographer, however, has been met by great and unexpected difficulties in this branch of the art. The introduction of toning by a neutral or alkaline solution of gold has brought out defects in the manufacture or in the albumenising of paper which were unknown under the treatment with the old hyposulphite bath. A return to that process, however, so full of danger to the permanence of prints, cannot be resisted too strongly, and the remedy must be sought in the manufacture of the paper, or in its subsequent preparation. It is found that uniform and perfectly even tints may be obtained by the new method on paper prepared with diluted instead of pure albumen. If, therefore, the taste for that highly glazed surface be modified, the difficulty at once vanishes.

In dry plate photography a process in tannin has been introduced by Major Russell, and has been highly spoken of by several photographers. It possesses, however, a disadvantage which is much calculated to retard its popularity; for it is a matter of great difficulty to preserve the film without an application to the plate in the first instance of gelatine or analagous substances, and the addition of those materials to the silver bath is

injurious in the extreme. The process, however, is as yet but little known, and further experience is required before a correct opinion can be formed of its capabilities.

The hot water process introduced to this Society by Mr. Parry has been practised during the year by that gentleman and by others, and at one of the meetings of the Society Mr. Young prepared and developed plates. Those who have adopted it are at present but few, and results under the hands of more operators are required. It is, however, believed that it cannot enter into competition with the collodio-albumen process of Taupenôt.

The process with albumen and a chloride, by Messrs. Petschler and Mann, has been extensively practised by the former of these gentlemen; but the results do not appear to be equal to the ingenuity which led to the discovery. A want of atmospherio effect pervades the whole of the specimens which have been seen; and this process also must yield to the original Taupenôt as regards the quality of negative, but as a keeping process it is believed to excel most others.

The plates sent out by Dr. Norris continue to be popular with those who do not prepare their own, and the certainty of their action has established them as a sort of refuge for the destitute. A great drawback, however, to the use of these plates is that they must be developed as speedily as possible after exposure. The rapid dry plates of Dr. Norris have justified the assertions made as to the shortness of exposure required, but the negatives are very deficient in density and vigour.

The Taupenôt or collodio-albumen has not only maintained its ground, but has advanced materially in public opinion. This Society may be said to have been the cradle of the process, and it is among our own members that the best specimens are to be found. Plates 24 inches by 18 have been used by Mr. Sidebotham and Mr. Mabley, and by others negatives 16 inches by 12 are commonly produced. Continued experience has shown that in the preparation of plates by this process a bath of iodide of potassium should be used previously to the application of the albumen. This may not be so necessary in the winter months, or when it is not desired to obtain a surface which will remain unimpaired for a length of time; but in all cases it is the safer method.

A great improvement in the development of collodio-albumen negatives has been introduced by Mr. Wardley. That gentleman found that he could employ a solution of pyrogallic acid without silver and without acetic acid, or other such retarding agent. Since his announcement of the fact it has been extensivly adopted by others, and with results which leave no doubt as to its value. The attention of photographers is particularly called to this improvement as likely to lead to the establishment of collodio-albumen as a rapid process; for, by prolonged immersion in a solution of pyrogallic acid the details of a picture may be brought out, which under the old method would have been abandoned as hopeless. Mr. Mudd has lately obtained landscapes with the natural clouds by an exposure of thirty seconds, and it is probable from other experiments that a much shorter period would suffice.

The waxed-paper process has received a new and important impulse, under the judicious management of members of this Society, Mr. Hooper, Mr. Sheard, and Mr. Rogerson. These gentlemen have been most persevering in their efforts, and the Society's portfolio now contains many beautiful specimens of their skill on the whole sheet of photographic paper.

In lenses the year has been marked by the introduction of Mr. Dallmeyer's triple combination. The definition afforded by this lens in copying is unexceptionable, and the lines are perfectly free from distortion. Mr. Sutton's panoramic lens has also been brought out by Mr. Ross, and affords negatives which include a very large angle; but as this has reference to one direction only, the picture is necessarily confined to a flat oval, and the perspective is not correct.

A Committee of this Society was nominated to confer with the officers of the British Association, and the result was a Photographic Exhibition, held during the meeting, in this city. The plan adopted by the Hanging Committee afforded full opportunity of judging of the merits of the leading process; and it must have been a source of great satisfaction and pardonable pride to the members of this Society to have seen how that method which they have nurtured from its infancy could stand a comparison with the most favoured of photographic processes. It was to be expected that collodio-albumen would be strongly represented here; but most trustworthy authorities declared that it could, for delicacy and for all those other high qualities which a photograph should possess, be favourably compared with any other process.

The classification of the Great Exhibition of 1862, in which photographs are arranged with mechanical appliances, has given offence to many who consider photography one of the "fine arts." Although this Society has, with others, protested against this arrangement, it must be confessed that the great bulk of photographs are still mere mechanical productions; and we should all strive to rescue our art as much as possible from that reproach by an infusion of artistic and poetic feeling, and thus to prove that it is not of necessity mechanical, but that it carries with it the means of receiving the impress of genius and the conception of the beautiful. It has been observed that a notable change has already taken place in this direction, and the importance of pursuing it cannot be too strongly enforced. That photography will eventually gain the coveted position is certain; but how soon this may be mainly depends upon those who follow the art. It possesses in itself a far higher character than engraving for showing the true artist; and, although every one cannot be a great photographer any more than a great painter, it is within the gift of all to exalt the character of their productions.

Since the last Annual Report was issued photography has sustained a heavy loss through the retirement of Mr. Hardwich. As one who laid the foundation stone of photographic chemistry his services were invaluable, enhanced by the consciousness that every one felt of his having written in good faith. To him belong numbers of those researches, so modestly given, and which should be so thankfully received, upon which we now build our practical operations. The Council feel it their duty to express thus their sense of services rendered to photographers, and they feel sure that the members in general will join them in wishing Mr. Hardwich God-speed in that path which his sense of duty has prompted him to follow.

To Mr. George Shadbolt, the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, the best thanks of the Society are due, for his kind attention to its interests, and for the assistance he has at all times been ready to afford.

The report and balance sheet having been adopted, the following officers were elected for the session 1861-62.

President.—The Lord Bishop of Manchester.

Vice-Presidents.—J. B. Dancer, F.R.A.S., J. P. Joule, LL.D., F.R.S., J. Parry, H. E. Roscoe, B.A., J. Sidebotham, and W. C. Williamson, F.R.S.

Council.—The President, the Vice-Presidents, Messrs. A. Brothers, S. Cottam, J. H. Gilbert, — Haywood, W. Hooper, E. Mann, H. Miller, — Mason, — Montefiori, G. Nevill, A. Patterson, H. Petschler, J. J. Pyne, H. Tobler, G. Wardley, and H. Young.

Hon. Secretary.—W. T. Mabley.

Treasurer.—Edwyn Offer.

Mr. PETSCHLER brought before the meeting a few notes he had made during a tour upon the Continent. The first was a simple method of strengthening weak negatives. The negative having been developed with iron, and well washed previously to being fixed, was placed in the window or otherwise exposed to strong daylight: the intensity gradually deepened without fogging the shadows. The time required was from half-an hour to several hours, according to circumstances, during which time it required occasional examination. He saw this practised very successfully in Newbrandenburg, a small town in Mecklenburg Strelitz, by Herr Baler, *the* photographer of that place. Another thing he observed was developing by green light, at Herr Liesegang's, in Elberfeld. The glass used was a yellowish green, by means of which the state of the negative could be ascertained much better during development. Since his return he had adopted the same method, and found it to answer much better than materials of orange or yellow. If the light on the window were very strong, the simple yellowish green would not be a sufficient protection, and a light yellow screen should be added, keeping the green shade on the side next to the operator. In another place he found the greenish light made use of towards the latter state of development, a yellow blind being added, which might be used at pleasure. After the developer had been applied, the shadows appeared to take no harm, even if the screen were not quite proof against actinic rays. A washing apparatus which he met with deserved, he thought, notice: from its simplicity, any amateur might make it for himself. [Mr. Petschler sketched the arrangement upon the black board.] It consisted of a vessel of any convenient size, placed upon a fulcrum on which it could turn, but weighted so as to keep it level when empty, or partly filled. At one end of the vessel was a pipe for supplying water, and at the other end a siphon was adapted. The water accumulated up to a certain height and then overcame the weight, so as to cause the vessel to turn upon its fulcrum, and this movement, by filling the siphon, caused the water to be drawn off, after which the weight again coming into operation, restored the vessel to its level position, and so the operation was continued. The supply-pipe was of course of less diameter than the siphon, so that the water could be drawn off faster than it was supplied. He had also noticed a method of producing soft prints from hard negatives. This was effected by placing a sheet of white paper over the outside of the frame during the exposure, especially in a strong light: the operation would, of course, be slower, but a comparatively soft positive would be obtained.

Mr. SIDEBOTHAM said that he saw clearly the advantage that would arise from using a green instead of a yellow light in the developing-room, if the actinic rays could be sufficiently excluded. It must appear to all how much pleasanter a light of that tint would be; and he believed that the condition of the negative would be ascertained more correctly. He should certainly try the method. In reference to the mode of printing described by Mr. Petschler, he thought there was nothing more in it than printing in a weak instead of a strong light.

Mr. WARDLEY observed that the method of strengthening weak negatives might not operate by the exposure to light. He had himself been in the habit of drying such negatives slowly, and the particles composing the picture appeared, under such circumstances, to go closer together. In reference to covering the printing-frames with white paper, he thought it was merely to prevent the negative getting too hot, and to subdue the light. In his own experience, however, he never regarded the amount of light to be used for a particular negative. He had many of every grade of density, and never could discover any difference in the positives, whether printed in sunlight or shade.

Mr. ROGERSON said that he differed in opinion from those who could see no use in the white paper covering when printing from a hard negative. He frequently practised it himself, and with very marked results.

The CHAIRMAN observed that although it would appear at first sight that the only effect was to subdue the light, the result spoken of might arise from the inequalities of the paper bending the rays so as to cause them to lap around the lines composing the picture; and although the negative was in close contact with the sensitive paper, there was a film of varnish to be taken into consideration.

Mr. HOOPER stated that the washing machine described by Mr. Petschler was certainly very simple; but he thought that an apparatus which he employed was much more so. It was simply this:—The waste pipe in the bottom of a vessel was continued upward to the level which it was desired the water should attain, over this was placed a corked bottle with the bottom removed, and the arrangement was complete. Water being admitted into the vessel, found its way beneath the bottom of the bottle, driving the air down the waste pipe, and when the desired level was attained, the water followed and emptied the vessel, after which the filling again commenced, and so on. He had, in the apparatus employed by him, formed the upward extension of the waste-pipe by adopting a separate piece, which could be removed at pleasure, so as to be out of the way when not required.

Mr. NOTON exhibited some negatives taken upon a double film of iodised albumen. The further consideration of the subject was postponed until the next meeting, on the understanding that plates would then be prepared and developed in the room.

Mr. HAYWOOD presented the Society with a photographic print which he had purchased at Berlin on account of its great stereoscopic effect.

Votes of thanks to the officers of the past year, to the Chairman of the evening, and to Mr. Haywood for his donation, concluded the proceedings.

BRADFORD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Wednesday, the 3rd instant,—William Henry Leather, Esq., in the chair.

The SECRETARY was requested to read the minutes of the previous meeting, which, after some consideration, were passed.

The CHAIRMAN then called attention to a proposition made at the last meeting with respect to the selection of the presentation photograph, which he supposed would be given at the annual meeting in November.

Mr. Stanley said that he believed the choice of the photograph devolved upon the Committee, and he would therefore move that a meeting of the Committee be held on Wednesday evening, the 9th inst., when a decision should be come to.

Mr. Stanley's proposition was carried unanimously.

A Member: Mr. Chairman, is it the intention of the Society to hold a Photographic Exhibition?

The Chairman: That is a matter entirely in the hands of the members.

A Member proposed that the matter should come under the notice of the committee meeting, and that some arrangement should be made, if possible, for organising an Exhibition.

The proposition was acceded to, the result to be made known at the next meeting.

The Chairman said he had very great pleasure in announcing that a paper, written expressly for this Society by George Shadbolt, Esq., Editor of The British Journal of Photography, would be read to the meeting, and if no member had any proposition to make he would call upon the Secretary to read the paper, which he felt sure could not fail to be interesting to all dry plate workers and admirers, as it was *On the Choice of a Dry Process.* [See page 357.]

The paper having been read, a very animated discussion arose between the dry and wet-plate workers, the admirers of the latter certainly having a better impression of dry plates than that at first entertained.

Mr. Sutcliffe proposed, and Mr. Burrow seconded, a vote of thanks to the Editor of The British Journal of Photography, for his most valuable illustration of the practice of the different dry processes, which was carried by acclamation.

Mr. Wood remarked, in answer to a question from Mr. Abbey, that dragon's blood and shell-lac might be used instead of gum to advantage, as it was not liable to crack; for gum alone was too brittle, and dragon's blood too pliable, but used in equal proportions the result was satisfactory.

Mr. Abbey had much hope of gum and borax, though his opinion had no supporter; but he assured the Society he was working to obtain reliable plates, and he trusted his results might induce other members to make a trial.

Many fine prints by various processes were exhibited, and much admired, especially one (a dry-plate) by Mr. Beldon, which was truly characteristic of the value of photography for architectural subjects, being a print, 10 by 8, of the *Bradford Bank.*

The meeting was then adjourned until the 6th proximo.

CHORLTON PHOTOGRAPHIC SOCIETY.

This Society met on the 10th instant,—John Heywood, Esq., occupying the chair.

After the minutes of the previous meeting were passed, the President said he thought it only just to inform the members that Mr. Fawcett had requested his acceptance of a beautiful specimen of landscape photography, in recognition of his services in connexion with the late Society. The negative from which the picture was produced was taken on a collodio-albumen plate, 11 by 9, the lens employed being the front one of a Goddard's half-plate combination, stop three-eighths of an inch, and exposure five minutes. The picture exhibited good definition up to the extreme edges, and was in other respects eminently satisfactory.

This print and another by the same operator were handed round, and originated a short but lively conversation on artistic arrangement of subjects, during the course of which several droll suggestions were offered for the removal of obstructions when in the field.

Mr. Griffiths then opened a discussion on the subject of Mr. Wardley's paper, read at the previous meeting, the chief points raised being the advantages or otherwise of slow development, and the functions individually or conjointly performed by the albumen and collodion films.

Mr. Wardley explained that a quick development frequently caused a peculiar appearance—a kind of halo on the edges of objects that project into the sky of a picture, whereas similar defects never occurred in the process of slow development.

Mr. Hooper and other members corroborated the opinion of Mr. Wardley on this point, and the members generally seemed to concur in the opinion.

In reference to the parts played by the two films, Mr. Fawcett said he had concluded, from the result of experiments made by himself some time ago, that albumen itself in its normal condition had some influence in the production of negatives by the process under consideration. In the experiment to which he alluded he had coated a plate with simple albumen, and after drying immersed it in the silver bath and washed it in the ordinary way. This plate after exposure gave him a very passable negative.

Mr. Wardley wished to supply a slight omission in his paper, viz., that it was necessary to add occasionally a few drops of acetic acid to the second sensitising bath, otherwise plates prepared in it would be found not to keep. He also desired to explain that the addition of acid to the hypo. fixing solution was simply to guard against alkalinity, alkaline solutions possessing the property of dissolving the albumen film.

After the usual acknowledgments to the Chairman, the proceedings closed.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held in the Tower, New Bridge Street, on the 4th inst.,—Mr. P. M. Laws, in the chair.

A letter was read from Mr. Thomas Sutton, of Jersey, in which he promised to send a paper to be read at the November meeting.

The Secretary called the attention of the meeting to a new camera, by Mr. Sutton, for taking instantaneous pictures, He spoke highly of the improvement, as one very valuable and well worthy the attention of photographers generally.

Mr. Birnie described the back part of the camera, in which the novelty consists.

"Within the camera there is placed a moveable reflector, making an angle of 45 degrees with the bottom, and which can be turned up and down at pleasure, by means of an external handle, exactly in the same way as Mr. Dallmeyer's instantaneous shutter. The ground-glass is placed horizontally in the top of the camera, and when the reflector is down the image is thrown upon the ground-glass *erect* (but reversed as regards right and left),—and this image can be accurately focussed upon the horizontally ground-glass by turning the focussing-screw of the lens; and when in focus upon the ground-glass it is also in perfect focus upon the collodion film, which is symmetrically situated on the other side of the reflector, and in its usual place in the camera.

* * * *

"The reader will now easily understand the general principle of this new camera, and perceive its importance. For taking portraits of children and for instantaneous views it is the exact thing wanted to make, in many cases, all the difference between success and failure; and for taking portraits generally it is a valuable instrument far superior to the common camera. This new reflecting camera ought to come into general use amongst all classes of portraitists, and we think it can hardly fail to do so in time; but unfortunately the march of improvement is slow, and the force of prejudice in favour of established usage difficult to overcome, however inconvenient and imperfect."

The diagrams exhibited were well examined, and the improvement was generally approved of by those present at the meeting.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

Committee—The Most Noble the Marquis of Drogheda; the Right Hon. the Earl of Uxbridge; the Right Hon. the Viscount Ranelagh; Sir Thomas Maryon Wilson, Bart.; Right Rev. William Thomson, D.D., Bishop of Gloucester and Bristol; Matthew Marshall, Esq., Chief Cashier to the Bank of England; Major Stuart Wortley; James Glaisher, Esq., F.R.S., F.R.A.S., &c.; J. D. Llewellyn, Esq., F.R.S.; John Penn, Esq., F.R.S., &c.; George Shadbolt, Esq.

Honorary Secretary—Mr. A. J. Melhuish.

Printers and Publishers—Messrs. M'Lean & Melhuish.

At a Committee meeting of the above-named Association, held on the 30th ult., at 26, Haymarket, the Right Hon. the Earl of Caithness was duly elected a member of the Committee.

Several practical details relative to the method of conducting the business of the Association were discussed and arranged, and others proposed for future consideration. Numerous specimens of negatives already sent in were examined and approved, many receiving high commendation. Specimens of the proofs from some of the negatives, presumed to be a fair average of the whole, were also laid on the table. A Report on the present state and future prospects of the Association, was read by the Secretary, and adopted by the meeting, as follows:—

"It is with considerable satisfaction that I place before the Committee the present state and future prospects of the Amateur Photographic Association, the scheme for which was first made known to the public in the middle of May last. Although hardly surprised, I felt much gratified at the outburst of approval with which it was received, and the very general and lively interest which it excited amongst photographic amateurs. From the first announcement of its formation to the present moment the list of members has steadily increased: this day, for instance, I have registered three new names. Nor has its influence been confined to this country alone, but it has extended also to those on the European continent, as well as to our most distant colonies. This will be seen by the packets of letters now upon the table, including communications received from various localities in Europe, India, Canada, Antigua, Rio Janeiro, Cape of Good Hope, &c., which display an unanimity of sympathy with, and approval of, the objects of the Association which is seldom witnessed; in fact, the sentiments expressed by correspondents may be epitomised in these few words, which I extract from several of the letters before you—viz.: 'I have much pleasure in joining the Association;' 'I cordially approve of the scheme;' 'I shall be glad to render it every assistance that is in my power;' 'I think the thanks of photographers are due to the gentlemen who have devoted their time and attention to the formation of so excellent an association;' 'I believe it to be the very thing that was wanted.'

"The future prospects of this Association are no less satisfactory than its present condition. Although but a small per centage of the members have as yet sent in their negatives, those already received exceed four hundred; and whilst at least a multiple of that number may be safely

calculated upon, should those who have yet to contribute do so in anything like the same proportion, the number to be dealt with will be exceedingly large. Of the high quality of the negatives you will be able to judge from the several parcels now on the table before you, which have just been received, and from the proofs which I now exhibit, these being selected as a fair average sample from the whole of the negatives received up to the present time.

"I submit that these specimens demonstrate unmistakeably that we already have amongst us photographers of whom the members generally may well be proud, and prove that the works of many amateurs are, to say the least, fully equal to those of their professional brethren. This Association, although little more than four months old, already numbers just 160 members, and receives daily additions, so that we may fairly pronounce it to be a great success, being, to use the words of the prospectus, 'an Exchange Club of the most extensive kind, a bond of union, and a medium of communication such as no mere society, however excellent, can ever hope to offer, and which will give an interest and a stimulus to amateur photography from which great results must flow.'"

Foreign Correspondence.

Paris, October 9th, 1861.

Most of the photographic journals have reproduced the description published by a certain M. Jos. Balsamo, of a process for printing positives with phosphorus. On reading in the above description all the new and strange facts which the author reveals, one would believe that an important scientific discovery had been made—that to the already-known wonders of photography a new one had been added. Unfortunately, all this must be largely diminished. A series of careful experiments made by Dr. Schnauss dispel all illusion on the subject. That learned chemist has several times repeated the operations indicated by M. Balsamo, and that with scrupulous care and in such circumstances that the want of success could not proceed from him. The only result he has obtained is the conviction that the process does not exist. None of the effects announced took place. The phosphorus remained obstinately insoluble, and not a trace of the image was formed on the paper. Supported by this judgment of Dr. Schnauss, we would go so far as to doubt the personality of the supposed inventor. Joseph Balsamo is the title of one of Alexander Dumas's novels, and the name of a personage half real, half fantastic, whom that author has taken for his hero. Is the writer of the communication in question as much a creature of the imagination as is his namesake? Perhaps so.

Let us enter the domain of reality, and speak of the successful commencement of M. Léon Duval's explanatory lectures at Marseilles in connexion with the Exhibition now open in that city. The first of these lectures was delivered on the 1st of October to a numerous audience of both sexes. The crowd was so considerable that more than a hundred persons were unable to obtain admittance. This is an excellent symptom, and it proves the interest that photography awakens everywhere. The Marseillese are not willing to be left behind; and they are in the right. They lack neither sunshine nor intelligence; and, judging from their eagerness to learn, we may hope that some of them at least may succeed in turning these two elements to profitable account.

The letter addressed by Mr. Cummings, of Lancaster (N.S.A.), to *Humphrey's Journal*, and reproduced by the *Moniteur de la Photographie*, on a process for obtaining photographic pictures in relief, has led to the announcement from one of our Parisian artists of similar researches undertaken by him a long while since. We have not seen the results obtained; but the artist informs us that, though not yet complete, they are far from being unsatisfactory. The inventor of photographic sculpture, Villème, is about to open an operating-room in Paris. Will the reduced bust have the same success as the visiting card? The first advantage of this innovation, from an industrial and commercial point of view, will be its novelty; and that is a great attraction for the public. Besides the plaster and marble portrait, M. Villème purposes working for clock and bronze manufacturers, and for cabinet-makers, whom he will supply with groups, statuettes, and ornaments at a cheap rate.

I have lately seen some very fine equestrian portraits, executed at the various establishments consecrated to that branch of the art, which have been formed this year. Great progress has certainly been made. Among the pictures of turnouts I saw an admirably-executed two-horse *calash*, with coachman and footman, and four persons inside. Each face was a complete portrait. In the card style these pictures are very effective and successful.

The firm of Goupil, the most important of our print dealers, have just commenced the photographing of all the engravings they have published. This collection, which the objective is about to popularise, forms an almost inexhaustible storehouse. The purchasers of the photographs will not in general be those who make collections of engravings. Goupil will therefore have two publics for the same subject; and, while a taste for the beautiful will thus be excited and nourished, those who cater therefor will not, I think, be without their reward in the shape of goodly profits.

ERNEST LACAN.

New York, September 28th, 1861.

In my last I spoke of some recent applications of gun-cotton and collodion. I have now the honour to make some important additions to that record.

For some time past the paper used for the cartridges of the Colt revolver (pistol) has been converted into pyroxyline, by soaking the paper in the ordinary mixture of nitric and sulphuric acids. By this treatment the paper is scarcely changed in strength or sensible properties, but becomes as combustible as gunpowder, and is wholly consumed on the discharge of the weapon. The advantages of such a cartridge are, that the powder is more quickly inflamed, and that, the combustion being complete, no foulness is left in the barrel. A recent improvement on this gun paper cartridge seems to have brought the article to its ultimate perfection. The improvement consists simply in dipping the cartridge, ball and all, into a thin plain collodion. The effect of this is a varnish over the whole surface—beautiful, silky, and waterproof. The edges of the paper are thus cemented together, and the contraction, on drying, forces the powder together in a compact mass. The cartridges may be thrown into water with impunity, and, becoming much stronger by the collodionising, may be handled quite roughly.

Another invention much talked of, and of a similar character, I am unable to describe so exactly. It is a ball cartridge in which no paper at all is used; but the ball is held to the powder by means of collodion, and the surface of the powder is varnished with collodion. It has a very neat appearance; but I suspect the practical difficulties in the way of its construction may keep it out of use.

Experiments are about to be made, on a somewhat extensive scale, to test the utility of gun-cotton for bombs. If anything of interest transpires in this regard I will report it.

I have before me a stereo. picture, made by one of our skilful amateurs, which I am exhibiting at my office as a photographic curiosity. I call it "The what is it?" the problem being to determine what it represents, and which is the top of the picture. The first decision of the spectator is, generally, that it is a picture of a Chinese pagoda on a highly-ornamented flower-stand. This decision is, however, weakened by a closer examination, and by the uncertainty as to which end the object stands on. The imagination may now come to the relief of this bewilderment, and decide that a burlesque statue of a soldier or a boot-jack is represented.

Now the interest of this mystery is greatly heightened by the fact that the picture is a very good photograph, sharp, distinct, and full of detail.

The explanation is this:—The camera's station was taken on the bank of a small lake. The opposite bank was straight, the water was perfectly quiet, and the landscape was doubled, the joining being the water line along the middle of the picture. The trees, rocks, &c., with their corresponding reflections from the water, give the appearance of the symmetry of ornamental work. A small house peeping through the trees destroys at once all the illusion.

CHARLES A. SEELY.

PHOTOGRAPHS BY MOONLIGHT.

In a late number of *La Lumière*, M. Gaudin, after extracting from the pages of an English contemporary an account of some photographs lately exhibited at Birmingham by Mr. Breeze, and alleged to have been *taken* by moonlight, comments as follows:—

"I had read this description on its appearance, but I considered it what it really is—a puff addressed to rich English lords; but, as it has come into France without having been contradicted, it is necessary to look into it.

"In my opinion these impressions are the result of faint instantaneous proofs obtained in broad *sunshine*, and it is their intended faintness that produces the effect of moonlight, for we are infinitely far from being able to produce, photographically, anything by the light of the moon; the whole night would not suffice; and even with that, the shadows would be so much displaced, that we could only obtain views covered with spots.

"Do not let us forget that, in reality, the moon, although it presents the contrary idea, gives three hundred thousand times less light than the sun. No photographic artifice can alter that; and if we can now obtain a negative for the stereoscope in a tenth part of a second of time in the full light of summer, we should absolutely require three hundred thousand times as much time by the light of the moon, supposing her to remain in the meridian in winter during the whole of the necessary time, which would occupy eight hours; and on account of the weakness of the light in proportion as the moon had risen, and the necessity to use dry collodion, which acts about ten times as slowly as other collodions, it can be said with certainty that, at present, no one can obtain a negative of an object by the light of the moon, using, under the most favourable circumstances, the whole of the night for the exposure.

"With regard to the impression of the moon herself, which is scarcely as bright as a cloud, it would be produced almost as quickly as the background in daylight; but nothing that she shone upon could be produced without an exposure exceeding the length of the entire night. Comets, like the moon, give us only a reflected light; and, in order to have reflection, it is absolutely necessary that they shall be incidence of the light upon a surface of a liquid or solid material. This is probably what takes place with the comets. Their development is immense; but the particles of which they are composed are so isolated, and generally of such great tenuity, and separated from each other by long intervals, that the luminous intensity of these heavenly bodies is in inverse proportion to the space which they occupy."

PHOTOGRAPHY APPLIED IN A NEW DIRECTION.—The Mettray Colony, near Tours, is a well-known reformatory for youthful convicts. The moment a young rascal enters the precincts of this house of correction, he is obliged to grant a sitting to the photographic artist of the establishment, and a similar proceeding takes place when the urchin makes his exit after undergoing his term of imprisonment. In a paragraph now going the round of the papers it is said that the first portrait represents the rags, dirt, and misery, the physical and moral degradation, the prematurely careworn features, the scowling, cowering, timid, uneasy, and withal ferocious look of the born thief. The second shows the same individual transformed by the magic of judicious discipline, which includes physical comfort and kind treatment: his dress is now clean and neat, and his countenance is redolent of health, contentment, self-confidence, benevolence, and energy. Philosophy had never, in any age, a grander subject for contemplation than two such pictures

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

RESINED COLLODION.

To the EDITOR.

SIR,—When a man has courage to avow his change of opinion, he thereby shows that he is wiser to-day than he was yesterday. Now I have very many times insisted that it was expedient first to obtain a choice negative, and then to secure it by means of some adhesive fluid poured over it subsequently. But the loss of what would have proved first-class negatives (by the collodion as treated by the Abbé Despratz) for want of some retaining medium to keep it from slipping off the plate, has at length satisfied me that it is indispensable first to coat with albumen, gelatine, or some equivalent. Mr. Glover has advised the following:—Dissolve just sufficient India-rubber (pure) in benzole or in mineral naphtha so that it will filter through blotting-paper, pass it through twice or thrice, cover the plate, drain, and dry before the fire.

I, however, have preferred to coat first with diluted albumen, according to the formula so admirably suggested by yourself, viz., one drachm of white of egg to seven of water, with twenty drops of liq. ammoniæ. There is no mode of working preserved collodion to equal this method, and I propose to trouble you with the very successful plan that has been pursued by Mr. Glover and myself.

The plates are first coated with the above solution—and here let me remark that without being aware of your knowledge of the plan you have recommended to a correspondent, "Verdant Green," in the last number of the Journal, I have dipped the plates into rain water, drained slightly, poured on the solution (filtered for each plate to keep out bubbles and dust), and then when the plates are dried, back and front, before a brisk fire, it is impossible to tell there is anything upon them, unless their backs be marked with a diamond. With this coating it does not matter what kind of pyroxyline is used, whether it be hard and horny, or porous and pulpy (I hate the word powdery as applied to moist coverings). For the iodiser there is no better than that recommended by Mr. Hardwich in page 277 of the last edition of his *Manual*. Let these conditions be stedfastly adhered to: the most intense negatives may be obtained with perfect certainty in only twice the exposure of freshly-sensitised wet plates.

I am quite willing to admit a certain excellence in Major Russell's tannin process; but what a tedious exposure is required! Why it is enough to disgust the Sun himself with photography! I have now before me two negatives prepared by each plan, which, as they were in a double slide, were exposed in the same camera, with the same stop, and in the same light, and were also prepared and developed with chemicals identical for each. Mark the results:—The resined plate is a fully deep negative in one and three-quarters of a minute, the tannin under-exposed in eight minutes. Why what would trees in the calmest day be like in that time?

I am rejoiced to have the fact confirmed by Mr. Hislop that these plates may be preserved unchanged for six weeks; but, let him try the plan communicated to me by Mr. Glover, and he will find no limit to their keeping qualities. Upon taking the plates out of the bath let them be washed back and front, with not less than twenty-four ounces of rain water (this for plates 10 by 8). Now have ready a large spare bath filled with spring water, and, tilting the bath towards you, the reverse way to what it stands, slip the plate gently in, so that, when the bath is set down the right way, the plate falls slowly with its face to the back of the bath: the dipper will keep the coating from being injured. Here let it remain not less than half an hour! The colour of the water will show at the end of that time that the former washing, copious as it was, has failed to wash away all free nitrate. By a gentle flushing with more rain water to remove any remains of precipitate, most of which has fallen to the bottom of the water, a plate perfectly free from stains and fitted for any amount of keeping will be secured.

I am also a convert from the plan of redipping after exposing; but, as the nitrate has been so perseveringly removed previously, a large quantity is requisite for development. Have ready one and a-half grain of pyrogallic acid in one drachm of spirit and one drachm of water; in another measure half a drachm of the nitrate bath, and one drachm of acid acetic fort to six drachms of water. Pour rain water upon the plate so as thoroughly to moisten the surface, mix your two solutions, and pour on and off until the most *exigeant* taste for deep, full-bodied negatives is satisfied. Success is certain.—I am, yours, &c.

C. COREY.

P.S.—In the report of the North London meeting you are represented to have said, when quoting Mr. Glover's opinion, that any influence the resin might exert was due to the picric acid; whereas I strongly suspect you really did say it was pinic acid, as most probably it is. Though the former may be obtained from the same substance, they widely differ, as the following symbols will show:—

Picric acid .....$C_{12}\ H_3\ 3NO_4\ O_3$
Pinic acid .....$C_{40}\ H_{30}\ O_4$

The good effect of picric acid is more than questionable.

GELATINE SOLUTION.

To the EDITOR.

SIR,—On looking over the back numbers of THE BRITISH JOURNAL OF PHOTOGRAPHY, I find in your notice of my little book, in the number for the 15th August, a question about my plan of preparing gelatine solution. I have long been familiar with the use of albumen in clearing gelatine. Perhaps it may be as well to give my reasons for preferring acetic acid. In the first place, the latter seems to clear the solution equally well, and its use involves less trouble, as the liquid merely requires warming and filtering; whereas, when albumen is used, it must be boiled with alcohol before it becomes clear. Again, gelatine solution cleared by albumen is much more liable to become decomposed: this is an evil in itself, besides which it would seem to indicate that a trace of albumen escapes coagulation, and, in my opinion, its presence is prejudicial, as it forms, by the action of nitrate of silver, a soluble compound, which decomposes spontaneously, and is apt to cause fogging, especially when long kept in warm weather.

The entire removal by washing of the matter in question is difficult, when it is beneath the collodion film and the latter is close in texture.

October 10th, 1861. I am, yours, &c. C. RUSSELL.

COLLODIO-ALBUMEN.

To the EDITOR.

SIR,—I am somewhat diffident in addressing myself to your valuable Journal, and more especially because my communication calls into question your reply or answer to the former part of "Dry Plate's" inquiries which appeared in this day's Journal. To quote his own words—"After the hypo. is removed, and the washing is commenced, the film begins to shrink up in ridges, *tree-shaped*, and increase to such a size that they do not recede on drying, thus spoiling the negative." I have had the above-named difficulty, and lost pictures through it. It arises, I believe, from fixing the pictures in impure or *alkaline* hyposulphite of soda—that is, if the plate was not blistered previously in development.

The remedy I adopt and recommend is, whenever a new fixing solution is made to add thereto a few drops of acetic acid, which will neutralise any alkalinity. Most samples of hypo. possess a strong alkaline reaction. I have never known the loss of a picture since the above simple addition was adopted. I am, yours, &c.

Manchester, Oct. 1st, 1861. GEO. WARDLEY.

[Our correspondent is a skilful practitioner of the collodio-albumen process, and no doubt his experience will be of service to "Dry Plate." We do not perceive the slightest reason for hesitation in affording it, our object being not self-glorification, but assistance to others.—Ed.]

AN ACCIDENT, AND ITS REMEDY.

To the Editor.

Sir,—Will you kindly inform me in your next issue how to proceed in the following case:—

Wishing to make a new nitrate bath I put by mistake three ounces of silver into a bottle containing some hyposulphite of soda in solution. I wish to know whether I can recover the silver, and if so, the best method of procedure? I am, yours, &c.

Ipswich. HYPOSULPHITE.

[Precipitate the silver in the form of a sulphide by the addition of a solution of sulphide of potassium, of which you will probably require about one and a-half ounces to effect the conversion of your three ounces of nitrate of silver. Dry and pulverise the precipitate, and rub it up in a mortar with about twice its weight of common nitre (nitrate of potash).

Make a common clay crucible red hot in a brisk fire, and throw into it, little by little, the blackish mixture. At each addition deflagration will take place, and metallic silver will be left behind in a spongy kind of mass. This should be cleared by boiling it in water acidified with hydrochloric acid, and after being washed may be dissolved in dilute nitric acid to restore it to the condition of nitrate of silver.—Ed.]

THE LATE MR. HOWLETT.

To the Editor.

Sir,—The fact that I included in my list of errata in the late Exhibition at Manchester the name of a deceased artist, does not, in my opinion, invalidate the inference I drew. I was fully aware of poor Howlett's untimely death, and for that reason should have been glad to have seen some of his pictures—that of the *Great Eastern*, for example.

Few exhibitions would be considered complete without an old master or two. Mr. Doyle's picture sale is almost entirely made up of them, and as this was not advertised as a collection of the works of living artists I do not think such omissions should have been permitted. With regard to my own omissions, which are many, I must crave the indulgence of your readers in what I have said. I have endeavoured to do so in a plain outspoken manner, at the same time wishing "nought to extenuate, nor set down aught in malice." I am, yours, &c. Σ

PROPORTION OF ACID IN THE SILVER SOLUTION.

To the Editor.

Sir,—In adding acid to the intensifying silver solution, as advised by Major Russell, ought the usual amount of acid to be also used in the pyro. solution?

Also, as a general rule, what proportions of citric are to be added to the silver solution in the wet process? I am, yours, &c. R. G.

[Certainly not: the acid is added to the silver solution instead of to the pyrogallic acid, in order to retain an uniform proportion between the *nitrate of silver* and *citric acid*, allowing a variation in the amount of pyrogallic acid, the object being the avoidance of fogging. In the wet process we perceive no advantage in this method of working, there being always some free nitrate on the plate, so that the proportion is not constant. Temperature also materially influences the quantity of citric acid required.—Ed.]

ZINC PLATE BOXES.

To the Editor.

Sir,—About two months ago I took into Normandy seventy stereo. tannin, and twenty 10 by 8, plates. The stereo. plates were in wooden, and the large plates in zinc boxes. All the large plates, with but few exceptions (even those that had not been prepared more than a week), were, on development, covered with black spots, comets, &c., especially at the corners and round the edges. The small plates remained good and free from the slightest spot to the very last, *i. e.*, a month after preparation. I was exceedingly puzzled by this comparative behaviour of the large and small plates, and although a suspicion did cross my mind that the difference must be caused by the boxes, I ultimately concluded that the 10 by 8 plates could not have received so large a proportion of washing as the small ones, and I thought no more about the boxes.

A fortnight ago I prepared forty stereo. plates (by tannin). I tried four of these on Tuesday last (eleven days after preparation), and got four as good and clean negatives as I could possibly desire. On Thursday I started with the remainder for Whitby, unfortunately carrying all in zinc boxes. I exposed them on Thursday and Friday, and to-day (Saturday) proceeded to develop. I have now developed about twenty, and *every one* of these is troubled with the spots, thus completely ruining the pictures, otherwise perfectly clean and brilliant.

I can no longer doubt that the zinc boxes have done the mischief, for all the plates were prepared together; and, as four of them developed so beautifully on the eleventh day after preparation, I cannot say that the four additional days could make the difference. All were treated exactly alike, except that the first four were never put in the zinc boxes.

Besides, on taking one of the undeveloped plates into daylight, and putting it under a microscope, it was found covered with small particles of metal, glass, &c.

The friction of the plates against the sharp-edged metal grooves has caused the mischief.

I am sorry to have to make this charge against the boxes, as they are so very portable. I hope Mr. Keene's zinc boxes, with *gutta-percha grooves*, will be free from this evil. I think that even these will not be perfect unless the top and bottom be also covered with gutta-percha, or the friction of the plates be prevented by means of a piece of elastic tubing.

If any other of your correspondents have been troubled with a like annoyance, and from the same cause, I wish they would make the fact known.

Any suggestions as to the best method of carrying a stock of dry plates on a trip, where a great deal of knocking about is inevitable, will be of service to many as well as myself.—I am, yours, &c., D. HORNBY.

Driffield, October 5th, 1861.

[We can readily understand why *zinc* boxes should be liable to ready abrasion of the metal; and further, spots of moisture would oxidate the zinc, which, though insoluble, would readily be rubbed off, and cause the spots on the plates. Perhaps a coating of shell-lac in naphtha or methylated spirit might remedy the evil with regard to the boxes you have; but we would advise your procuring some of tinned iron when you want any more. We believe that Mr. Keene's metal boxes, and also those sold by Messrs. Murray and Heath, are perfectly free from the defect noticed by our correspondent. We have personally used tinned-iron boxes, with grooves made of the same material, and carried them full of sensitive plates for pretty well a thousand miles by railway (out and home), without any inconvenience. We kept the plates steady by means of a piece of crumpled paper on the top. We had none broken or spotted on our return.—Ed.]

ANSWERS TO CORRESPONDENTS.

F. M. B.—Not sufficently good for a detailed notice.

W. H. (Leeds).—Received. Attention in due course.

Ardent Amateur.—See notice in the present number.

W. Daniels.—All three are good; but we prefer No. 3.

S. M.—We regret not being able to comply with your request.

George Dawson.—We have mislaid your present address: please send it.

Adhesive.—The only objection to the India-rubber solution is the unpleasant scent.

Old Boy.—An iron wire is quite unsuitable for the purpose: use a handle of wood, and bind on the flannel with silk thread.

Trotty.—A linen duster washed in soda and water, and well rinsed (avoiding soap), is better than wash-leather, in our opinion, for the purpose.

J. H. S.—The strength is not material, but, about ten grains to each ounce of water will be advisable. You may wash out your gutta-percha trough with the same; and it should be used whenever similar annoyances occur—otherwise it is needless.

Duffy Giles.—The backgrounds which you desire are regular articles of commerce: see our advertising columns. Should you desire to make them, stout calico sheeting, covered with plain or figured paper hangings of appropriate patterns, will answer.

M. H.—Too late for reply in our last. Photographic frontispieces we have seen for photographic albums, but where procurable we do not know: we have no doubt, however, that they are purchasable where the albums are to be had—probably of Negretti and Zambra, Murray and Heath, McLean, Melhuish, and Co., Hogarth, Clifford, &c., &c.

T. Mark.—We agree in the condemnation of the sliding body, as a rule; it is useful only when several lenses are to be used with the same camera. As to the supposed advantage of erecting the view, we believe it to be a mere illusion, and do not value it in the slightest degree; but there is no disadvantage that we perceive, and the arrangement is ingenious enough, allowing the subject to be watched until the instant of exposure.

Amateur.—1. The strength of the hyposulphite bath does not materially influence the *time* occupied in fixing a proof; but the number that it will fix without chance of producing "measles."—2. They were not enlarged, but taken direct from nature, with a portrait lens of long focus.—3. The orthographic lens can be used for taking portraits, *in a good light*. The chief difference in effect is the production of a flatter field; but it is a slow-working lens.—4. If you send a directed envelope we will reply to this question privately.—5. We do *not* think that iodide of cadmium is the cause of the phenomena you mention, but methylated ether. However, if the fogging does not return, it is of no consequence; if it does, add a little more tincture of iodine.

A Junior Photographer.—1. We do not know to what Photographic Dictionary you allude. We belive that one was published long since by Mr. Sutton, but we fancy it is "out of print."—2. An Almanac will most probably be issued with our number for the 1st January next year.—3. You must consult our advertising columns: it would not be fair to answer such a question publicly.—4. For taking portraits about £10—for landscapes perhaps £6 or £7; but all depends upon the extent to which you wish to go into the art.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 153, Vol. VIII.—NOVEMBER 1, 1861.

International Exhibition of 1862.—We presume that until after the opening of the Exhibition the subject of photography in connexion with it will be continually "cropping out," as the geologists would phrase it; hence we must not wonder at its having been *the* subject *par excellence* discussed at the first meeting of the South London Photographic Society, held on the 10th ult.

One gentleman read a paper with reference to it; much conversation followed upon it; and, to crown all, a memorial to the Royal Commissioners was agreed on, and we presume, ere this, has been presented. Alarm was no doubt depicted on every countenance—a yawning gulf was supposed to exist in the form of a vacant space where a committee for managing photographic affairs ought to be found. What was to be done? The South London Photographic Society, like a second Curtius, is ready to sacrifice itself for the salvation of its brethren by leaping bodily into the void space, and tenders its services to the utmost extent of its resources to the Royal Commissioners. Fancy the Royal Commissioners in despair availing themselves of the resources of a small (not to say very small) suburban Society! We cannot help calling to mind the refrain of an old song that was popular in our boyhood's days which ran thus—

"I give thee all, I can no more,
Though poor the offering be."

Though the memorial may have been presented, we have not yet quite done with it. It purports to be the memorial of The South London Photographic Society, consequently including every member thereof—not merely of those only who assented thereto. Had the managers of the affairs of that Society been at all conversant with the general conduct of public societies they would have been aware that the bringing forward of such a document as the "memorial" with a view to its adoption, *without previous notice*, was altogether an irregular, not to say an illegal, proceeding. But waiving for a moment this question, they ought surely to have known that the adoption of it by a majority, however large, could not in such a case bind the minority. It should therefore have been styled "the memorial of certain members undersigned," or "of the officers and committee," &c.

Now, oddly enough, the writer of this article happens to be a member of this notable Society, and therefore found himself in the ridiculous position of advocating two diametrically opposed courses—that is to say, he would have been so situated had the memorial been really what it professed to be, that of the South London Photographic Society: consequently he lost no time in forwarding to the Honorary Secretary a protest against the irregularity of the proceeding. What may have been its fate has not yet appeared; but it was incidentally remarked that most of the absentees, who were but few in number, were aware of the intended introduction of the memorial, and it was believed that not one was hostile to the movement.

Now, as the number of members present was certainly small—a fact which we have taken the trouble to ascertain—it follows that the South London Photographic Society consists *mainly* of its committee and officers, with just a few unofficial members; so that it resembles the celebrated skeleton of a regiment, comprising a colonel, a major, and one private. This is hardly the sort of Society to represent the photographic interest at the World's Fair.

We are by no means so sanguine that the Commissioners will be pleased to accede to the prayer of the memorial as one of the members expressed himself to be, and still less that if they did so photographers would be freed from the tender nursing of the sappers and miners; for is there not a governmental photographic department at South Kensington (which is so handy)? and will not its chief pull the strings whatever set of dummies may be installed as a committee? By the way, we may depend upon it that the more completely they are dummies the better for their own peace (little secrets will come out); and, though they may be permitted to talk, too much liberty of action will not be allowed. We have reason to believe also that some misapprehension exists when it is asserted that the Commissioners have conceded to photography a separate department. We have sought for, but cannot find, any authentic announcement of such concession—the nearest approach to it being, not a separate *de*partment, but a separate *a*partment, in which to exhibit photographic apparatus and photography. Nobody supposed that the latter were to be *exhibited* in direct contact with steam-engines and ploughs. It was not that fear which caused the Photographic Society to issue a protest: it was the classification alone that was considered offensive, and the classification remains *in statù quo*. What, then, has been conceded?

By the way we notice that our old antagonist, Sir W. J. Newton, has "fired a shot" in favour of M. Silvy's view that photography is not a fine art, and he asserts, moreover, that *it never can be so*. Well! this is not surprising; and certainly, however much we may differ from this gentleman in our view of the matter, we cannot, at any rate, charge *him* with want of consistency in his argument, as we truly can charge his ally, to whom M. Claudet has written a very able reply (which will be found in another column) in answer to the article upon which we commented in our last.

There is a point, upon which some little misapprehension exists, which we must notice. The course adopted by the Council of the Photographic Society in no way affects photographers who intend to exhibit. Each one would have been equally bound to have applied for space through the same channel as at present whether the Council had nominated the committee asked for or not; consequently every photographer is in precisely the same condition with regard to space accorded as he would have otherwise been. Of course all who intend exhibiting have already secured space, and are no doubt busily occupied in preparing their specimens, or arranging to do so.

Before concluding we would offer one suggestion for consideration. Having protested *a l'outrance* against the mechanical

estimate of our art, and presuming that the Royal Commissioners may be inclined to make some concession, however small, to what they may if they please regard as the prejudices of photographers, might it not be politic for the Council of the Photographic Society to intimate their willingness to accept, under protest with respect to classification, the allotment of a *separate room* for the exhibition of photographs, as proposed by the Royal Commissioners, provided that *photographic apparatus* be excluded therefrom, and exhibited in its proper place—that is, amongst the philosophical instruments?

DEVELOPING WITHOUT FREE NITRATE OF SILVER.

By G. Wharton Simpson.

[Read at a Meeting of the North London Photographic Association, Oct. 23, 1861.]

It has been a commonly received opinion among the majority of photographers that the presence of free nitrate of silver was a necessary condition to the development of the latent image produced by light on the sensitive collodion plate. Theoretically it has been held by some that the presence of any two of the now generally used salts of silver would ensure the conditions necessary to development; but practically the presence of the free nitrate has generally been regarded as an indispensable condition, both in dry and wet processes.

I wish to call attention to a method of development likely to prove of the greatest possible importance in dry-plate photography, which involves the negation of this condition. My attention was first called to the subject in a communication received from Mr. Mudd, whose collodio-albumen pictures are generally acknowledged to be amongst the very finest specimens of dry-plate photography. It is only right to add that Mr. Mudd gives the entire credit of the suggestion to his assistant, Mr. Wardley. The method of development referred to consists in the application to the exposed collodio-albumen plate of a solution of pyrogallic acid, without either acetic or citric acid, and without any nitrate of silver. The strength mentioned by Mr. Mudd is two or three grains to the ounce; but I believe the strength for this purpose is comparatively unimportant.

Contrary to what might be expected, the image rapidly develops very perfectly. When all the detail is fully out, the usual developing solution of pyrogallic acid and citric acid, with a little nitrate of silver solution, is applied, and the desired amount of intensity by this means obtained.

Having been struck with the manifest advantages of such a process, and having subsequently an opportunity of witnessing its simplicity and convenience in Mr. Mudd's hands, I was anxious to ascertain whether it was equally applicable to other dry processes. I have accordingly tried it on dry plates by a variety of processes besides the collodio-albumen. I have tried it on Fothergill plates prepared by different persons, on tannin plates, and on Dr. Hill Norris's extra-sensitive dry plates. Mr. Mudd, in a conversation I had with him on the subject, expressed an opinion that notwithstanding his plates received a very thorough washing after their final sensitising, some trace of free nitrate must be left, sufficient to aid development. I was led in my experiments with the plate referred to—especially in the Dr. Hill Norris's plates, which are, it is understood, entirely deprived of free nitrate of silver—to believe that development might be effected without any free nitrate whatever. In every instance I obtained an image more or less perfect on the application of pyrogallic acid alone. In order to test the matter still further, I excited a plate, and proceeded very carefully to remove all free silver. I washed it in several changes of common water, and finally placed it in a dish containing a strong solution of chloride of ammonium, leaving it there for about a quarter of an hour. I now washed it again very thoroughly, using several quarts of water. Having taken every pains by washing and the use of chloride to remove all free nitrate of silver, I exposed the plate, and then developed with the solution of pyrogallic acid without silver or acetic acid. In a minute or two a very perfect but very thin image was fully developed. On applying the usual developer and silver the image intensified satisfactorily. I think from this it may be fairly assumed that the principle is applicable to dry plates prepared by any process, no matter what pains may have been used to remove all traces of free nitrate. The collodion I used was prepared with a bromide as well as an iodide. What the result would be with a simply iodised collodion I have not had time to try; neither have I had an opportunity of trying salts of iron for developing under the same circumstances.

In referring to the advantages of such a process I think they must be very apparent. One of the most common faults of dry-plate negatives is hardness. This arises, doubtless, from two causes:—the first being a common tendency, especially in beginners, to under-expose their plates; but by far the most fruitful cause is the difficulty of determining, under all circumstances, the exact amount of silver to be added to the developer, so as to secure the proper harmony between the process of development in the film and that reduction of silver upon it by which intensity is obtained. If it so happen that prolonged development is necessary to bring out all the detail, it unfortunately also happens that accumulation of deposit on the high lights, burying all the delicate half-tone immediately adjoining them, is at the same time going forward. If the development be stopped in time to save the lights and lighter shadows, it frequently happens that much of the detail in the darker parts of the shadows is not brought out. The issue in either case is the absence of that delicacy, softness, and harmony of detail necessary to constitute a good picture. In the process I have been describing development proper is effected before the accumulation of intensity begins: the attention is devoted to one thing at a time, and facility afforded for having each part of the process under complete control. The value of this principle, or at least a partial application of it, is essentially recognised by Major Russell, who makes every provision, in his instructions for the tannin process, for the use of a very small quantity of silver until the image is fully out, and the subsequent use of a larger portion to give density; but, in no case that I know of, before Mr. Mudd's communication, was the possibility and value of developing without any addition of silver hinted at.

I may add a word or two in regard to the use of hot developing solutions. How far these can be used with advantage in any process, except the albumen or collodio-albumen, I cannot say. In regard to its value with the latter I can speak in the highest terms. In some cases where I have used it, perfectly detailed pictures have been secured with one-fourth of the exposure which would have been otherwise necessary. The mode in which I applied the heat was simply by using hot water first to moisten the plate; next applying a hot solution of pyrogallic acid, without free silver or acid, until all the detail appeared; and then intensifying with the usual developer and silver, without heat. As among the most satisfactory illustrations of this principle I may call attention to some of Mr. Mudd's recent pictures, which I have present. In one picture (11 by 9) you will see natural clouds perfectly secured. This was taken on a collodio-albumen plate, with a lens of fourteen inches focus and a half-inch stop, in thirty seconds.

My especial object is to call the attention of dry-plate photographers—of whom I know we have many belonging to this Society—to this method, so that its applicability to their various processes may be fairly tested. If it prove as useful as I hope, I think it will be hailed by all as a most decided step in the right direction.

ON POSITIVE PRINTING.

By Edwin Musgrave.

[Read at a Meeting of the Edinburgh Photographic Society, October 16th, 1861.]

As this paper is intended for the benefit of those members who have not had any great experience in positive printing, I do not propose to enter into the theory, but simply to confine myself to the practical details and some of the causes of failure in this process.

Although I do not recommend that amateurs, whose printing is on a comparatively small scale, should albumenise their own paper, as they are more likely to obtain a good result by purchasing it ready prepared from a dealer on whom they can rely than by preparing it themselves, I give here a formula for those who prefer albumenising the paper themselves.

The first thing is the selection of the paper. I prefer the *Papier Rive* and Hollingworth's thin paper, as giving the best results in my hands.

The formula for the albumenising solution is as follows:—To each ounce of albumen add ten grains of chloride of ammonium or sodium, dissolved in a quarter of an ounce of water. (Chloride of barium also gives a very fine tone. Some may prefer it. In that case it is requisite to double the quantity of the salt, to produce the same vigour of print as the other chlorides give.) Beat the whole up to a perfect froth with a bundle of quills or a fork. As the froth forms it is to be skimmed off into a flat dish to subside. When the froth has partially subsided, pour it into a tall narrow jar, or a bottle with a wide mouth, and allow it to stand for several hours.

An ordinary photographic dish is filled with the prepared albumen, by pouring it gently from the bottle into a glass funnel having a piece of clean muslin disposed as a filter, the beak of

the funnel resting on the bottom of the dish to avoid the formation of bubbles. Having ascertained the right side of the paper (the wrong side may be known by gauze wire markings), take a sheet by the two corners, bend it into a curved form, convexity downwards, and lay it upon the albumen, the centre part first touching the liquid, and the corners being lowered gradually. In this way bubbles of air will be pushed forward and excluded.

The following directions are given by Mr. Shadbolt, in THE BRITISH JOURNAL OF PHOTOGRAPHY (then called *The Photographic Journal*), 1st October, 1859, and I have followed them ever since with perfect success :—

"When the paper can be removed from the surface of the albumen without violently curling up, it is to be lifted by one corner, and allowed to drip for a few minutes, steadying it in a vertical position by holding also the adjoining corner with the other hand. After dripping for about a minute from one corner, the hand that steadied the neighbouring angle to that by which the paper was suspended is to be gently raised, so as to become in its turn the suspended corner, which proceeding will cause the albumen to flow off from a different corner to that from whence it first dripped, the flow being now at right angles to its former direction. After a few seconds—say half a minute—bring the corner next in succession to the highest point, and finally the fourth corner upwards, taking care that each one comes uppermost in *regular succession*, so that the drip has flowed from each of the four corners. If the operation above described has been correctly performed, the paper will now be coated on the surface with an even film of albumen, scarcely flowing at all. The great point to be aimed at is to *keep it* in the condition it now presents—that is, an even, brilliant film; and to this end rapidity in drying mainly conduces.

"The American wooden clips are extremely convenient for suspending photographic paper while drying, particularly if a common pin be thrust at its upper end, through one piece of the wood of which the clips are made, and bent in the form of a hook.

"By attaching two of these clips to a sheet of the paper the whole can be suspended in a vertical position from a cord. By placing a couple of chairs, one on each side of the fireplace, and stretching a string from one of the backs to the other, a convenient line of suspension is formed. The paper should be hung with the *plain side* towards the fire, and as close to it as possible, so long as scorching is avoided. In about a couple of minutes the drying will be complete and the surface of the paper smooth and brilliant, provided that the manipulations have been correctly performed."

The next operation is to sensitise the paper :—

Nitrate of silver	80 grains.
Distilled water	1 oz.

Prepare a sufficient quantity of this solution and pour it into a porcelain dish. Lay the sheet of paper upon the solution in the same manner as described for the albumen: three minutes contact will be sufficient. Raise the paper from the solution with a pair of bone or horn forceps, and allow it to drain a little before hanging up. When the sheet is hung up, a small strip of blotting paper suspended from the lower edge will suffice to drain off the last drop of the liquid.

For those who prefer plain paper, Mr. Hardwich's citrate of soda salting-bath will be found to give a very fine warm tone with the alkaline gold toning-bath.

The salting solution is prepared as follows :—

Chloride of ammonium	200 grains.
Citrate of soda	200 grains.
Gelatine	20 grains.
Water	20 ounces.

To prepare the citrate of soda, dissolve 112 grains of citric acid in the 20 ounces of water, and add 133 grains of the dried bicarbonate or sesqui-carbonate of soda used for effervescing draughts: then add the remaining constituents.

Use Hollingworth's paper with the above formula, each sheet being floated for one minute and then suspended to dry. Render sensitive by floating for two or three minutes upon the solution of nitrate of silver used for the albumenised paper.

PRINTING FROM THE NEGATIVE.

The best kind of printing-frames to use are those with springs in preference to screws, as the latter are very apt to break the negative or glass of the pressure-frame. The negative is laid flat on the glass of the frame, collodion side upwards; the sheet of sensitive paper is laid on the negative, sensitive side downwards, and a pad of thick felt or velvet is placed over it; the back is fastened down by the bars of the pressure frame; it may then be exposed to light. I prefer velvet myself as a pad behind the paper, as the short pile of the velvet presses the paper evenly all over, and secures fine definition.

According to the quality of the negative you must decide whether to use sunlight or diffused light in printing from it. If the negative be weak, with little intensity, print it in a very feeble light, with a thick green glass over it, by which means the shadows will be printed deep enough to give good contrast before the high lights are penetrated. But if the negative is intense, put it out in strong sunlight, so that the detail in the denser part of the negative may be printed before the shadows become too deep. You will by this means be able to get clouds if they are in a negative, supposing it to be a landscape —that printed in a diffused light would give only a white paper sky.

Occasionally one may have a negative that has been cracked; and, if the picture be of value, a print may be got from it by placing a piece of ground-glass about two inches above the pressure-frame, with the light carefully excluded from getting in at the sides, and place it in the sunlight to print. The result will be, that you get rid of the objectionable white line caused by the reflection of the light from one side of the crack, and the print, if properly managed, will show scarcely any mark at all.

In negatives in which some of the fine details have been rendered too dense to print in the ordinary manner, take a burning glass and bring the rays of the sun not quite to a focus, as that would burn the paper, and keep the image of the sun moving over the parts you wish to get details from, till they are brought out.

In some negatives the sky may be defective: in that case it is better not to paint out the sky of the negative, as doing so would prove the total destruction of the atmospheric effect. The best plan is to cover the sky with cotton wool, following the outline of the picture; and then, when the printing of the picture is completed, cover the part printed, take a piece of card, and shade the sky to the required tint, lighter at the horizon, increasing a little in depth towards the top.

In portraits a very good effect may be produced by vignetting. This is best accomplished by cutting out an irregular aperture according to your own taste, decidedly smaller than the picture required. Fasten this to the front of the printing-frame, about an inch above it; place the frame in a diffused light, so that the light may diffuse itself evenly, and a perfect softening will be produced. If the negative require to be printed in sunlight, the card must be kept rapidly moving over the negative to produce the same effect.

When the print is removed from the pressure-frame it is placed in water, and the water is changed four or five times at intervals, till it is no longer milky. The print is then placed in a solution of salt and water, about a salt-spoonful of salt to a pint of water. This is to obviate the necessity of over-printing very much, and to prevent the toning and fixing baths reducing the intensity of the print. Allow the picture to remain in the salt and water from five to ten minutes: this will give a reddish tint to the print.

The print is to be steeped in fresh water, and is then ready for the toning bath.

TONING.

The toning-bath is prepared as follows:—

Solution of chloride of gold	1 fluid drachm.
Carbonate of soda	10 grains.
Distilled water	6 to 8 ounces.

The gold is best kept in solution one grain to the drachm of water.

Dissolve the carbonate of soda in half-an-ounce of water, and add the solution of chloride of gold to it. Let this stand for five or ten minutes, and then add the full bulk of the water. The object of this is to convert a portion of the chloride into oxide of gold, and prevent eating away of the half-tones.

The prints are to be immersed in this solution—if large, singly; small ones may be laid side by side, as many as the dish will hold, face downwards, and another set may be placed on the top, face upwards. Take care that the faces of the prints do not touch each other, or red spots will be the result, from the non-action of the toning-bath on the parts in contact.

The print must be allowed to remain in the toning-bath till it has acquired a rich violet tint. If purple tones are desired, it must then be removed from the toning-bath and rinsed in water, and then placed in the fixing bath—one ounce of hyposulphite of soda to six ounces of water. It must be allowed to remain in this bath for about twenty minutes, if an albumenised paper: plain paper requires less—from ten to fifteen minutes, according as it is thick or thin. When fixed (which is ascertained by holding the paper up against the light and ascertaining the absence of spots of imperfect fixation), it is placed in a large flat dish, in a sink, with a good stream of water constantly running, for about four or five hours. It may be then taken out and immersed in nearly boiling water. After leaving it in this for a few minutes, the print may be taken out, immersed in cold water to shrink the pores of the paper again, and then dried and mounted.

The best substances for mounting photographs are freshly-made starch and gum-arabic. The prints are greatly improved also by being rolled in a lithographic press after they are mounted: this removes the appearance of grain in the paper.

I will now describe some of the failures. The most common are the following:—

1st. The print marbled and spotty after toning.

Causes.—A. Badly albumenised paper. B. The print allowed to rise to the surface of the toning bath. C. One, two, or more prints adhering or touching each other so as to prevent the action of the toning-bath.

2nd. The print has a cold and faded appearance when finished.

Causes.—A. The chloride of silver in the paper in excess with regard to the free nitrate of silver. B. From too weak a negative being used the light has not had time to cause a vigorous action on the paper. C. Over-action of the gold bath imparts a cold and grey tone to the picture.

3rd. Small specks and spots of various kinds. These, when not corresponding to similar marks in the negative, are usually due to metallic specks in the paper.

Remedy.—Try the effect of keeping the paper a month or two, that the metallic particles may have time to become oxidised.

4th. Marbled stains on the surface of the sensitised paper.

Remedy.—Draw a strip of blotting-paper gently over the surface of the nitrate-bath, and see that the sheet does not touch the bottom of the dish.

5th. Removal of the albumen from the paper during sensitising, and white deposit in the silver-bath.

Causes.—The bath is probably alkaline, and contains too little silver: add more nitrate of silver, with a drop or two of nitric acid.

6th. The print refuses to tone.

Causes.—A. Long keeping of the proof after printing. B. Too much alkali in the toning-bath.

When the printing bath becomes discoloured by use, Mr. Tunny's method of decolourising it will be found the most certain. It is as follows:—Add one drop of saturated solution of citric acid to the bath, and shake it up. This, if the bath be alkaline, will cause a slight deposit of citrate of silver, and will immediately clear the bath. The solution may then be filtered. If no deposit take place on the addition of the citric acid, it shows that the bath is still acid. In that case, one drop of ammonia added to it will at once produce the desired effect.

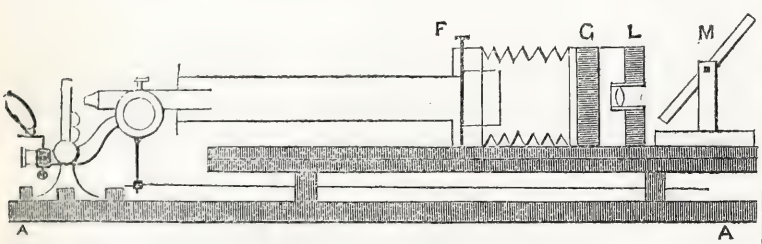
ON THE PRACTICAL APPLICATION OF PHOTOGRAPHY TO THE MICROSCOPE.*

By Professor O. N. Rood, of Troy, N.Y.

While the value of the photographic delineation of microscopic objects, as a means of accurately recording observations, seems to be generally acknowledged, yet, owing to the real or imaginary difficulties with which the process is beset, but very few working microscopists have adopted it.† After eight months of steady experimental work on the subject this fact appears to me a matter of astonishment, for the difficulties which are not inherent mostly disappear when proper precautions are taken. I propose to mention briefly certain points in my experience, and to indicate the methods pursued.

Arrangement of the Apparatus..— The microscope is brought into a horizontal position, and connected with a camera box by a blackened pasteboard tube: much vexation will be avoided by constructing at the outset the arrangement seen in the wood-

FIG. 1.



cut. *Fig.* 1. Blocks are fitted around the foot of the microscope that it may be firmly held in position, and the camera box slides between parallel strips of board, so that its distance from the microscope can be varied. The length of A A′ is seven feet. The frame holding the ground-glass slides is at G; behind it, at L, is a door on hinges, carrying an achromatic lens of two inches focal length, for the purpose of magnifying the image on the ground-glass while focussing: the glass plate should be finely ground. A tube lined with black velvet is to be inserted in the compound body, as recommended by Shadbolt, if the eye-piece is not employed. Precautions must of course be taken that light does not enter at unguarded points. At F is a rod connected with a flap of blackened sheet brass in the interior of the box, with which the exposure of the sensitive plate is very conveniently effected. It is obvious that while the operator is manipulating the mirror, or using the stage-movements, on account of the length of the apparatus, it is impossible for him to see the ground-glass, or even to know when light has been thrown on it: a plane mirror, mounted as seen at M, reflects the image of the ground-glass, enabling him not only to arrange the illumination with nicety, but to select the microscopic object, and to focus on it approximately. While the mirror is in use, the door carrying the achromatic lens stands open; the mirror is afterwards removed, and the focal adjustment completed with the help of the lens, by the rod and lever attached to the rack-work of the microscope. If the rack-work is moderately good, this arrangement is very delicate. When a high magnifying power is employed, it is essential that the microscope be provided with stage-movements to bring the object into its proper position. The lever stage is not to be recommended for this purpose.

Illumination of the Object.—That direct sunlight is greatly to be preferred is admitted by those who have experimented on this point. With light from a white cloud I have obtained negatives, in from one to three minutes, with 1 inch and ½ inch objectives: though not highly magnified, they were inferior to those taken with sunlight. Shadbolt obtained negatives by concentrating the light of a small camphene lamp on the object with two lenses. Wenham in repeating this experiment met with no success. I concentrated the light of two flames of a "burning fluid" lamp with a bull's-eye condenser on the object, employing the 1-inch objective without an eye-piece, and obtained, with several samples of collodion from different manufactures, absolutely no image at all, after an exposure of five minutes. With samples prepared by myself, tolerably intense negatives were obtained in four minutes. With the ½-inch objective a faint image was obtained in the same time. For my own work direct sunlight is always employed.

It is well known that the proper display of microscopic objects requires that great attention should be given to their illumination, not only in degree, but in kind: much has been written on this subject and an astonishing amount of labour bestowed on it. All this applies with double force to the illumination preparatory to the introduction of the sensitive plate: refined methods here find a most useful application. If the power employed be under 100 diam., the plane or concave mirror will answer, if the stage be provided with a diaphragm-plate having apertures of different size. The mirror should be most carefully adjusted, so that the maximum of distinctness in the image on the ground-glass is obtained. I was kindly furnished by Prof. Chas. A. Joy with a *silvered* mirror which Liebig presented to him some months ago, while on a visit in Europe. It furnished brighter light than the ordinary amalgam mirror: the use of Liebig's mirrors for this purpose, as well as for ordinary microscopic work, is to be recommended. With powers from 100 to 2000 diameters, a condenser of some form is needed. For powers from 100 to 400 diameters, an achromatic condenser, adjustable by rack-work, was used. Such a condenser must be provided with a series of diaphragms, having circular apertures differing in size, also with a set of central stops for annular oblique illumination.

Trial alone will settle which aperture gives the clearest image in any particular case. As the lenses of this condenser were not large, I constructed for powers from 400 to 2000 diameters a Wollaston doublet, with an angular aperture of 44°, the lenses being ·5 and ·6 of an inch in diameter. This condenser, when provided with a similar set of diaphragms, was found to answer very well, both as to the degree and quality of the light, negatives being obtained in fifteen seconds enlarged 1500 diameters. As the chromatic aberration was not corrected, it was found easy to illuminate the object either with white or bluish-white light, use of the red or yellow rays being of course carefully avoided.

The proper distance of the condenser from the object is a point of much importance, and is best ascertained by carefully repeated trials. To obtain really good results much nicety in arranging the illumination is required: this is a matter in which

* From *Silliman's Journal.*

† In Vienna microscopic photographs have been produced under the direction of Auer. Pohl and Weselsky have also worked at this subject. (*Sitzungsberichtd. Kais. Akad*, 1857, xxiii., vol. 1, page 317); at an earlier date Mayer of Frankfort obtained fine photographs of this kind. Bertsch presented similar results to the French Academy (*Comptes Rendus*, 1857, xliv.) Nachet also obtained good results. Hodgson (*Quart. Journ. of Micros. Science*, 1853, ii. p. 147), Delves (3rd No. of the same, p. 57), Shadbolt (ibid, p. 165), Highley (ibid, p. 178, also No. 4, p. 305), Wenham (same Journal, 1853, No. 10, p. 1), and Kingsley (*Phil. Mag.*, 1853, June, p. 461), have published accounts of their more or less successful results. Harting on the Microscope, *Brunschweig*, 1859. To the above must be added the great work now being issued in numbers in Munich entitled *Atlas der allgeminen theirischen Gewebelehre, herausgegben von* Th. v. Hessling *und* J. Kohlmann, *nach der Natur photographist von* Jos. Albert.

microscopists are well practised; but, to secure the best results possible *under the circumstances*, as in photographing test objects, the art and patience of the operator is taxed to the utmost, and several days are often consumed before a really satisfactory result is attained, even in the case of a single object.

Focal Adjustment, &c.—Trouble will be saved by selecting the exact object which is to be photographed by the microscope in an upright position; the instrument is then inclined and connected with the camera. After the compound body is thus placed, if the objective is provided with a "screw collar" for correction, this adjustment must be *carefully made*. Even when this point has received attention, it by no means follows that the chemical focus coincides with the visual, and the exact correction necessitated by this difference must be ascertained by trial. This can be effected by the use of the fine adjustment (see Shadbolt's paper). Contrary to some observers I have found it necessary, when using sunlight, with both high and low powers, with and without eye-pieces, to make this correction carefully. The use of the rod and the lever and achromatic lens has already been mentioned. After the corrected image has been thrown on the ground-glass it will remain nearly unaltered from thirty seconds to ten minutes, according to the power and mode of illumination employed.

Collodion.—This article when furnished by makers of repute can of course be used, though it is better for more than one reason to be independent of the dealers if possible. A considerable number of samples of pyroxyline were prepared according to different receipts and sensitised variously. The very simple process described by Waldack, on page 266 of his *Treatise on Photography*, was found with slight modifications to yield an excellent article.* The strength of the sulphuric acid was slightly greater than recommended by him; no water was added; the temperature also was slightly higher at the time of the immersion of the cotton. A more prolonged washing than that prescribed in this work is desirable. This collodion can be sensitised with advantage by the iodide and bromide of cadmium in proportion of four to one. A receipt published in *Humphrey's Photographic Journal* has lately been used by me with very good results.†

No. 1.	No. 2.
Plain collodion, 1 oz.	Plain collodium, 1 oz.
Iodide of ammonium, 5 grains.	Iodide of potassium, 5 gr.
Bromide of potassium, 3 do.	Bromide of ammonium, 5 gr.

Dissolve the iodide of ammonium and bromide of ammonium in alcohol, the iodide of potassium and bromide of potassium in the least possible quantity of water, before adding them to the plain collodion. Mix Nos. 1 and 2 in equal parts for use.

This collodion, when used according to the wet process, though not very intense when first made, is quite sensitive, negatives of landscapes being obtained in ¼ of a second, indicating by their strength that a shorter time would suffice. It acquires intensity by keeping. The exposure is effected by the flap at F, and will last from ¼ of a second to four minutes according to circumstances. The development is as usual, hyposulphite of soda being used as a fixing agent. The use of the bromide of arsenic, mentioned in the same Journal, gave with some samples of collodion excellent results so far as intensity was concerned.

The negatives thus obtained are examined by a lens of one inch focal length, to test their degree of sharpness. This quality will not only vary with the manipulation, but with the nature of the object: the sharpest negatives obtained by me, when examined by a power of 40 diameters, appear as well defined as finely executed lithographs seen by the naked eye, while other classes of objects (dots in pine wood, &c.), with all care, yield negatives which present the same appearance under a much lower magnifying power.

Positive Prints.—In order to preserve the fine details, the prints should be taken on glass, not on paper: mica answers when a print is to be transmitted by mail. Great care should be used that little or none of the fine markings on the negative are lost in this process; a bright light (sunlight thrown on the negative backed by ground-glass), a small diaphragm before the copying lens, and careful allowance for the chemical focus, are the essentials. To produce enlarged positive prints on glass, the negative is placed on the stage of the microscope and treated like a microscopic object, the magnifying power varying from 5 to 20 diameters. If the prints are to be on *paper*, it will be found that a more liberal use of nitrate of silver and chloride of gold than is generally recommended makes success easy.

* *Treatise on Photography*, by Chas. Waldack. Cincinnatti, 1860.

† *Humphrey's Journal*. Joseph H. Ladd, New York.

Magnifying Powers Employed.—To produce enlarged images the objectives, as is well known, may be used alone or in connexion with an eye-piece. In the former case, with proper illumination, sharp images are produced when the distance between the object (on the stage) and the ground-glass is as great as five feet. With this distance the

1 inch enlarges 65 diameters.
⅓ " " 190 "
1/7 " " 450 "

In using the objects in this way the screw collar is set *after* the microscope is connected with the camera.

For more highly enlarged images it is best to add the long eye-piece as has been practised by some experimenters. The adjustment of the screw collar can then be very nearly completed before the microscope is connected with the camera, which is a great saving of time: it will, of course, fall nearer the mark "uncovered" than in the first case. However perfectly this operation may be performed in either instance allowance must still be made for the actinic focus. By varying the distance between the eye-piece and the ground-glass, different degrees of enlargement are obtained. When the long, or two-inch, eye-piece is used, the distance from the object-slide to the eye *lens* being 12 inches, from the latter to the ground-glass 34 inches, then

1 inch enlarges 160 diameters.
⅓ " " 550 "
1/7 " " 1300 "

Powers obtained in this way with the two latter objectives have been used by me with advantage.

Thus with the 1/7th 113° aperture, the Wollaston doublet of 44° aperture, having a central stop, being used as a condenser, I obtained sharp negatives of the *P. angulatum* magnified 1300 diameters with well defined hexagonal markings similar to those obtained by Wenham with a 1/12 of 130° aperture. Portions of the negative bore a photographic enlargement of 10 diameters. Mr. Wenham announces* that he has discovered by the use of a 1/50th of large aperture, made by himself, that the markings on this object and on some others are really due to spherical particles of quartz, which can be made by illumination to appear hexagonal. With a power too low, I obtained photographs of the *P. Balticum* with *hexagonal* markings; with a higher power and a larger angle of aperture, the tendency was to the spherical form.

Photographs by Polarised Light.—A Nicol's prism is placed under the stage, one also directly behind the objective, sunlight is reflected from the mirror, and one of the prisms revolved till the field is dark; with the low powers, by this simple arrangement, photographs of objects may be obtained which exhibit the structure revealed by the polarised light. For higher powers it is necessary to use the polarising arrangement described by Von Mohl, *Pogg*, vol. ciii. p. 178, and recommended by Carpenter; that is, the light from a large Nicol's prism is concentrated on the object by an achromatic condenser. The perfection with which this apparatus operates may be inferred, when I state that photographs of the cross and rings in starch granules as well as of the *P. angulatum* in a dark field were obtained by me without difficulty. Von Mohl remarks that with inferior apparatus some very distinguished observers have been unable even to *see* these appearances. The selenite stage can of course be used when it is found desirable.

By arranging the apparatus according to the plan adopted by Prof. v. Kobell in his micro-stauroscope (this Journal [2], vol. xix, p. 425), the peculiar effects which microscopic crystals produce on the cross and rings of calc spar can be photographed. By removing the condenser and objective, as well as the slide containing the crystals, beautiful photographs can be obtained of the normal cross and rings: the systems of rings in other crystals can be photographed by substituting them in place of the calc spar, as well as the changes which they undergo by combination with plates of doubly refracting circumstances (circular analysis, &c.), it being merely necessary to introduce the plates or films at the proper positions. I was shown by Prof. Dove some years ago, while in Berlin, photographs of the normal cross and rings around the axis of the calc spar; but, so far as I know, this is the first attempt to photograph the changes which the cross and rings undergo by the action of microscopic crystals.

Stereoscopic Photographs of microscopic objects, can be obtained with the monocular microscope, by covering first the right-half of the objective, then the left by a suitable brass cap, and taking two successive pictures. When using this method it becomes necessary to move the mirror towards the right or left hand with each successive exposure, which is not only inconvenient, but often pro-

* *Quart. Journal of Mic, Science*, No. xxxi., p. 145.

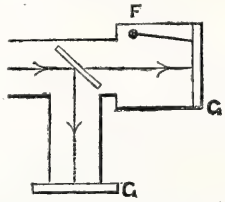
duces a slight distortion that prevents the proper stereoscopic union of the two photographs. On this account I have generally adopted a different plan. The object is placed on an extra stage, which can be inclined from 5° to 10° as seen in profile in the woodcut, *fig.* 2: it is photographed first at one angle then at the other. In practice the manipulation is easy, and no particular difficulty is experienced from the fact that the extreme right and left hand portions of the field are thrown slightly out of focus. High and low powers can be used equally well. The second negative should be taken immediately after the first, before the illumination has altered. I do not know that stereographs of microscopic objects have actually been taken by other experimenters, though this may easily be the case.

FIG. 2.



Living Organisms offer the photographer some difficulties by their constant motion about the field, and in and out of the focus. It becomes necessary to adopt a plan by which the image can be thrown on the sensitive plate the very instant after the animalcule has been brought into focus. The following method has been used by me with success to obviate this particular difficulty:—A plate of glass with parallel sides is introduced at an angle of 45° into the tube outside of the camera: it reflects an image of the object to the ground-glass at G, *fig.* 3, which is placed so that an equally sharp image of the same object is formed at G'. The sensitive plate is introduced at G', the flap at F being closed: with one hand the operator, by the aid of the image at G, focusses on the animalcule, just as this effected; the plate is exposed by the other hand turning the flap. If the collodion be sensitive, a second, or less, suffices to give an image; if a longer exposure be desired the image of the animalcule on the ground-glass at G can be watched, and the exposure prolonged till the creature begins to change its position. The real difficulty in the case of living organisms is found in the fact that all parts of them do not lie in the same focus. This in fact is one of the most important difficulties connected with the whole subject of microscopic photography; but the introduction of a slight modification in the ordinary *compressorium* removes it in many cases. The plate of glass on which the objects rest, instead of being plane, is made slightly *convex*, by the use of a spectacle lens of rather long focus. Objects to be examined are placed near the point of contact, and pressure applied as usual, when they are brought nearly into the same plane.

FIG. 3.



CONCERNING "CHEAPNESS."

We know not whether the author of *Popular Fallacies* intended to publish a supplementary volume to that work. We think it but fair to assume that he did, or he would not have been guilty of so grave an omission as he has been. That most popular of fallacies, "cheapness," should certainly have had a chapter devoted to it; indeed, we ourselves think it should have occupied a foremost position in that work. Should we ever perpetrate a book of the kind it would occupy the post of honour. An evil so widely spread, so universally indulged in, so pregnant of ill, and often so calamitous in its results, as the rage for cheapness (so called), surely deserves our earnest consideration. This pernicious evil ramifies itself through everything and every undertaking. The scale is infinite—extending from the small sums daily wasted by individuals on cheap rubbish, up to the disastrous results wrought by the desire of Railway Companies to work their lines cheaply, and to put what is after all but a few pounds more into each shareholder's pocket. Houses, cheaply run up, fall, and bury their occupants in the ruins; ships sink, and are lost, from being inadequately manned or provided for emergencies; trains come into collision, and men, upon whom the long expensive education and preparation necessary for high and special purposes has been lavished, are mangled and crushed into a shapeless mass of quivering indistinguishable humanity. The task would consist not in finding matter for such an essay, but finding where to stop.

We will not enter upon the discussion of a *wise economy* generally. A thing to be efficient need not necessarily be "dear." Cheapness and efficiency are antagonistic, though they may be reconciled. But it requires experience, skill, judgment, and many qualities not to be at once obtained, ere we can safely and really secure whatever we desire at its minimum ratio of cost.

> "Others' follies teach us not,
> Nor much their wisdom teaches;
> But most of sterling worth is what
> Our own experience preaches."

To those who have arrived at that stage I have nothing to say. To others—better to pay too much for a good thing than less for a bad one. In the former case you have something to show, albeit you paid some twenty-five per cent. too much; in the latter, nothing but what crumbles to dust and ashes, and perishes with the using!

We are sorry to be forced to see that this monster, "Cheapness," has fastened upon photography, and that his fangs have already made deep impressions in the beloved form of our beautiful art. We deplore it the more that we cannot congratulate *any one* as gainers—certainly not the purchasers of his progeny! Such satyrs smile but to deceive, and attract only to betray; and what is false and illusionary can result in nothing but what is unsatisfactory and disappointing.

One of the most lamentable phases of this evil is cheap printing. It is so because its ill consequences are more widely diffused, and therefore so much the more disastrous to the material progress of photography. A bad and fading glass positive ends with itself; but the multiplication of bad, poor, and fading prints, disseminated throughout the community, leads to a general distrust of the permanency of *all* photographic prints whatever. People will only purchase sparingly what they cannot be at all certain will endure any length of time. This limits the sale. We know of one or two liberal patrons of photography who have given up collecting photographs for their portfolios in consequence of the chagrin experienced by seeing them perish. Thus it re-acts against the producers themselves, and like evil deeds "comes home to roost," which is not much to be deplored; but unfortunately the wheat and the tares grow together, and the conscientious and pains taking suffer equally with the guilty.

There is little hope of this vicious propensity dying out while there are so many ever ready to pander to it. Yet it is a species of charlatanism of which no honest man should ever be guilty. That abomination, "cheap portraiture, executed by ruffians," is born of the same vice. It is at once the misfortune of photography and a great impediment to its best and highest development that the commercial element can enter so extensively into it as it does. We have no faith in "printing by the acre," or in anything else that cannot—as in the old art—be done by the individual, or under his immediate superintendence, and in which he can take a personal pride and interest and responsibility. The highest results are only obtainable in this way, in whatever department of the art. Certainly "cheap printing," so called, may safely be denounced as a delusion and a snare. S. T.

UPON SOME IMPROVEMENTS PROPOSED BY SIR DAVID BREWSTER IN THE PHOTOGRAPHIC CAMERA.*

By Edwin Emerson, of Troy University, N.Y.

Sir David Brewster, in his *Treatise on the Stereoscope*, repeatedly and earnestly insists on the importance of taking the photographic negatives by a lens of a very small aperture. He gives, as a general rule (p. 177), "an aperture as large as the pupil of the eye;" and he makes, also, the following declaration:—"I have no doubt that when chemistry has furnished us with a material more sensitive to light [than that possessed in 1856], *a camera without lenses and with only a pin-hole will be the favourite instrument of the photographer;*" in the meantime, however, he suggests that "the use of a lens of rock-crystal, which has a low dispersive power, and having the ratio of the curvature of its surfaces as six to one, with an aperture of one quarter of an inch, would make an approximatively perfect camera" (pp. 137, 138).

Being convinced, by the excellent results obtained by myself, that a small aperture was indispensable to success in point of sharpness, which was a confirmation of Sir David Brewster's main idea; and, having been furnished by my friend, Prof. Rood, with an instantaneous collodion, I began to test by careful experiments Brewster's notion of a pin-hole camera, and also the use of a quartz lens for the camera. I also endeavoured to determine approximatively how small the diaphragm of the ordinary photographic camera should be reduced so as to secure the best results. The instrument in my possession is a very exellent stereoscopic camera fitted with two portrait combination tubes, and the best achromatic lenses, of Harrison's make. The results were either obtained by this camera or were compared with its work.

Photographers generally focus upon the ground-glass of the camera with the unaided eye, and, of course, in a majority of instances get only an accidental approach to a perfect focus; and when the aperture is over half-an-inch, for lenses of six or eight

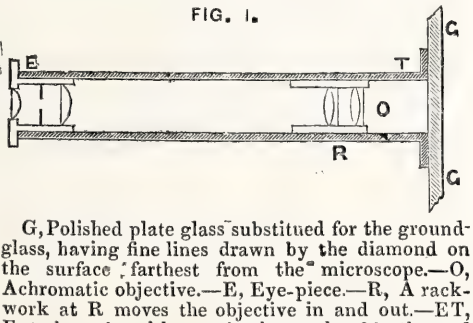
* From *Silliman's Journal.*

nches focus, only a small portion of the whole picture is in focus t all. Those who use a magnifying-glass and a smaller diaphragm ucceed better; but, by neglecting to reduce the diaphragm to a ninimum, their results are by no means as perfect as they might e. By the aid of a common magnifying-glass one and a-half nches in focal length, with which to view the image on the ground-glass of the camera, and an aperture of two-fifths of an inch in he diaphragm in taking the negative, I was able without any lifficulty to obtain results fully equal in point of sharpness to he best French transparent views. But in attempting to improve ipon this, by reducing the aperture and by increasing the power of the focussing-lens, two difficulties were experienced:—1st. The ight was so much diminished that it was well nigh impossible to see minute shades of difference in thesharpness of definition; and, 2nd, the inequalities of the finest ground-glass were so much enlarged as seriously to obscure and distort the view projected upon it. This last proved an insuperable bar to any higher degree of excellence by these means, as a single irregularity in the ground-glass was magnified quite enough to obscure many fine details. Moreover, with a small diaphragm of the size recommended by Brewster the light was so faint that a variation of half-an-inch in the distance of the lenses of the camera from the ground-glass produced no *perceptible* variation in the sharpness of the image. A series of experiments was then made with two objects in view:—1st. to carry up the power of the focussing lens; and, 2nd, to substitute for the ordinary ground-glass of the camera something of finer texture so as to stand the microscopic enlargement, and of more transparent quality so as to increase the light. An ordinary "Fothergill" plate, covered with the delicate yellowish film of iodide of silver, enabled me to carry the magnifying power to fifteen diameters with an aperture of one-fifth of an inch. At the suggestion of Mr. Grunow, of New York, a plain glass plate, lightly covered with dust, was tried, which, with a power of fifteen diameters, rendered practical the employing of an aperture of three-fifths of an inch. But in all the experiments with a single microscope the focus was too indefinite and uncertain for the accurate work I had in view, although the sharpness obtained was far beyond anything I had seen produced by the professional photographers. Indeed, among both British and American artists and amateurs in photography there seems to be a wide difference of opinion as to what may be regarded as *a standard* on this important point. I have not seen a suggestion of the proper means of determining it, which is, undoubtedly, an appeal to the compound microscope.

At this stage of the investigation Prof. Rood constructed for me a compound microscope of a power of thirty diameters, which I hoped to be able to employ as a focusser. Its form and construction will appear from the following diagram, *fig.* 1.

This instrument I had intended to use upon the focussing plate of plain glass delicately covered with dust; but it occurred to me that possibly plain glass alone would answer to focus upon, and, if so, all the obstruction caused by magnified particles of dust, and the want of sufficient light caused by the opacity of the Fothergill film, or anything of a similar character, might be entirely overcome. A flat surface of the glass.

FIG. 1.



G, Polished plate glass substitued for the ground-glass, having fine lines drawn by the diamond on the surface farthest from the microscope.—O, Achromatic objective.—E, Eye-piece.—R, A rack-work at R moves the objective in and out.—ET, Exterior tube with a projection at the objective end at right angles, so as to apply it accurately to the

trial showed that the amount of light was very greatly increased; but I was now unable to determine the position of the image projected by the lenses of the camera. The lenses of the camera connected with the lenses of the microscope formed a telescope of considerable power, the lenses reciprocally supplementing each other, so that, no matter where the image produced by the lenses of the camera might be formed in space, the microscopic focusser could be readily adjusted to suit it, and give a perfect view. To obviate this uncertainty, fine parallel lines were drawn by a diamond, one-twentieth of an inch apart, upon the surface of the plain focussing-glass nearest to the lenses of the camera: the microscope was then carefully adjusted to distinct vision of these lines, and its lenses fixed in that position. It was now easy to cause the image formed by the camera to coincide in position with these parallel lines, and thus the perfect physical focus for the sensitive plate was absolutely determined, allowance, of course, being made for any difference between the chemical and visual foci, which this arrangement afforded a means of adjusting with the greatest accuracy.

By this method of focussing, very small objects, such as a single leaf of an elm tree over a half mile distant, were distinctly visible, and were readily focussed upon; and, also, the difference in the focus of objects at a mile and those at a mile and a-half distant was made apparent, which is utterly beyond the power of the single microscope. The use of a very small diaphragm enabled me now to secure the finest details in all the objects visible in an extended landscape, so that they would bear examination under the compound microscope with a power of 150 to 200 diameters; or, in other words, with a power as high as the structure of the collodion would bear. Up to this time I had supposed that the lenses of my camera were of the same focal length, as very delicate manipulations had failed to detect any discrepancy between them; but, by this method of focussing, a variation of nearly one-fifth of an inch was detected immediately. By the use of the instrument the aperture was reduced to one-tenth of an inch, which from careful experiments I regard as about the minimum for good results, for lenses of six inches focus.

I was now prepared to test the ideas of Sir David Brewster:—1st, with regard to a small aperture; 2nd, with reference to a rock-crystal lens; and 3rd, as to a pin-hole alone substituted for a lens, in connexion with a very rapid collodion. By means of the binocular camera I was able to make two experiments simultaneously on the same plate, the left-hand view being taken by the portrait combination, and the right-hand view being taken with a quartz lens, or a common glass lens, or a pin-hole, as the case might be. The scenes or objects photographed were always exposed to the full light of the sun; and the plate, in each pair of experiments, was, of course, subject to a uniform treatment, under similar conditions as to collodion, baths, &c. I was thus able to compare the results of the various experiments side by side with the action of the achromatic combination, as follows:—

Portrait combination, 6 inches focus.	*Quartz lens, 6 inches focus.*
1. One second's exposure, $\frac{1}{4}$-inch diaphragm. A pretty fair negative.	1. One second's exposure, $\frac{1}{4}$-inch diaphragm. Action slightly quicker, negative pretty fair, but less sharp.
2. Thirty seconds' exposure, $\frac{1}{4}$-inch diaphragm, good negative, would stand a magnifying power of 30 diameters.	2. Thirty seconds' exposure, $\frac{1}{4}$-inch diaphragm. Action slightly quicker, more contrast, but would not stand a magnifying power of 5 diameters.
3. Two minutes' exposure, $\frac{1}{10}$-inch diaphragm, strong negative, view sharp all over the field, would stand a magnifying power of 100 diameters.	3. Two minutes' exposure, $\frac{1}{10}$-inch diaphragm, no quicker action, no stronger negative, and would not stand a magnifying power of 5 diameters.
4. Two and a-half minutes' exposure, $\frac{1}{12}$-inch diaphragm, negative good, but would not stand a power of over 50 diameters.	4. Two and a-half minutes' exposure, $\frac{1}{12}$-inch diaphragm, no quicker action, negative would only stand a magnifying power of 4 or 5 diameters.
5. Pin-hole diaphragm, could see nothing distinctly to focus upon, four minutes' exposure, very faint impression on the sensitive plate.	5. Pin-hole diaphragm. Similar result.
6. Pin-hole diaphragm, seven minutes' exposure, strong negative, but no fine details.	6. Pin-hole diaphragm. Similar result.
7. Common glass lens, 6 inches focus, $\frac{1}{10}$-inch diaphragm, two minutes' exposure, view sharp, would stand 30 diameters, tolerably.	7. $\frac{1}{10}$-inch diaphragm, two minutes exposure, quartz action quicker than the glass, more intense negative, but not as sharp, owing possibly to a slight double refraction in the lens.

Portrait combination, 6 inches focus.	*Pin-hole alone.*
1. One second's exposure, 1 inch diaphragm, a good negative.	1. One second's exposure, result nothing.

Portrait combination, 6 inches focus.	*Pin-hole alone.*
2. Thirty seconds' exposure, half inch diaphragm, a good negative.	2. Thirty seconds' exposure, result almost nothing.
3. One minute's exposure, ¼-inch diaphragm, good sharp negative.	3. One minute's exposure, faint shadowy outline of a picture.
4. Two minutes' exposure, $\frac{1}{10}$-inch diaphragm, excellent negative, details of objects, with a mile good under a magnifying power of 100 diameters.	4. Two minutes' exposure, middling contrast between light and shade, but exceedingly blurred in all the details.
5. Three minutes' exposure; picture over-exposed, with $\frac{1}{10}$-inch diaphragm.	5. Three minutes' exposure, view of a white bust in the sunlight, good contrast of light and shade, picture only of the prominent outlines looked like a very rough mosaic.
6. Three minutes' exposure, $\frac{1}{12}$-inch diaphragm, good negative, but not sharp enough for a power of 50 diameters.	6. Seven minutes' exposure, negative strong enough to print from; but no sharpness at all; details blurred and confused.

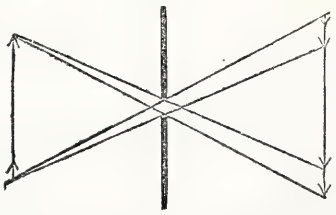
The results of these experiments may be summed up as follows:—

1. It is found in practice that a quartz lens is quicker in action than a common glass lens of the same aperture, focus, and thickness.

2. A quartz lens is very slightly quicker than the double combination of achromatic lenses; but it will not afford anything like so sharp details even under the smallest diaphragms. "A quartz lens camera with ¼-inch aperture" is, therefore, very far from being "an approximatively perfect camera."

3. The simple pin-hole will not compare under any circumstances with the commonest glass lens, as it gives no sharpness to the picture, and requires from three to seven minutes' exposure with the most sensitive collodion. This lack of sharpness might have been predicted theoretically. To give sharpness to the image, the pin-hole must be as small as the smallest detail in the view required—say the ten-thousandth of an inch—otherwise the rays of light from a single point travelling such paths as are indicated in the diagram produce necessarily a blurred image; thus—(*fig.* 2), *i.e.*, sharpness will be in proportion to the smallness of the pin-hole; now as a pin-hole of the $\frac{1}{10}$th of an inch in diameter requires with the most sensitive collodion an exposure of several minutes, it is apparent that a hole the ten-thousandth of an inch in diameter would require an exposure entirely impracticable. We are compelled, therefore, to regard Sir David Brewster's pin-hole camera as an optical as well as a photographical absurdity.

FIG. 2.



4. The diaphragm for lenses 6 inches in focus can be reduced down to about an aperture of one-tenth of an inch with a very decided improvement in sharpness, if the compound microscope is used to focus with on a plain glass focussing plate; but when we reduce the aperture below this there is a loss of sharpness, owing, it may be, to the approximate parallelism of the rays.

5. A good use for a pin-hole camera would be as a simple instrument for testing the sensitiveness of collodions; and I would recommend it for this purpose.

Troy University, August, 1861.

A FEW NOTES ON DRY PLATE PROCESSES AT HOME AND ABROAD.

By W. J. C. Moens.

[Read at a Meeting of the North London Photographic Association, October 23, 1861.]

I THINK it is pretty generally admitted that all dry-plate processes are more or less uncertain in their results. I do not mean by this to say that good pictures cannot be taken, even by the most unpopular of them; but the failures which even the most careful photographer is sure to meet with from time to time always causes him to look with great anxiety to the period when he shall develop the plates which he has exposed with so much care and trouble, and on the success of which he probably has looked forward to for months. This is taking the case of amateurs. With professionals it is even worse: they hardly dare to leave an order to the uncertainty of a dry-plate. The effect of this is that dry photography has gradually been deserted by most of its former adherents, for the simple reason that they cannot afford to lose a large per-centage of their exposures. I cannot help thinking that the chief cause of most of their failures, which commence at stains and end at blisters, is the humidity of our climate, which causes the plates to be more or less damp from the time of cleaning them till they are developed. In France and Italy, where wet collodion is the exception and dry plates are the rule, you do not find these failures: there, especially in Italy, the air, generally speaking, is so dry that gelatine takes the place of our gum and resin varnishes.

Simple albumen and collodio-albumen are the two dry processes most generally followed. Those splendid views of the French Cathedral, the ruins of ancient Rome, and the statues in the various museums, are nearly all taken by the former. Collodio-albumen is more used for stereographs. There is one thing we must remember in speaking of our neighbours' use of dry-plates—their views are almost, without exception, architectural: trees are studiously avoided, and the skies painted out, all which makes their work more easy. I purpose now to give you a few hints I picked up of French, Italian, and German photographers, as regards their method of working these two processes. Generally speaking, our brethren abroad make the greatest mysteries of the simplest matters, and are very far from being communicative.

They are very particular in drying, with heat, their plates before coating them: neglecting to do this is the chief reason of blisters, and is a precaution which should never be neglected. Very often, instead of mixing an iodide with the albumen, they subject the plate to the fumes of iodine. The large plates are coated by spinning the plate, fixed on a holder made for the purpose, and pouring the albumen on the centre: it soon reaches every corner, and the excess is driven off by the motion imparted to the plate. It is carefully dried in a horizontal position, with a board between each plate. The nitrate baths are generally flat trays of gutta-percha, thereby avoiding the enormous vertical bath that would be necessary for the large plates used.

The development is effected by gallic acid, and conducted as follows:—The plate is levelled on a stand, and a saturated solution of gallic acid, a *few days old*, is poured on, and spread over by means of a piece of clean blotting-paper. This is left on for a few minutes, in order to thoroughly moisten the film, then poured off, and an equal quantity of nitrate of silver, of from fifteen to twenty grains to the ounce, spread over in the same manner. This quickly brings out all the detail, when the silver solution is poured off into the gallic acid first used: this is found desirable in order to obtain the required density, taking care not to make them too thick. This is a powerful, safe, and quick method of development, and you can attend to several plates at the same time. Should a plate be under-exposed, the flame of a spirit lamp, carefully passed backwards and forwards under the plate, will often aid the required details to make their appearance. It is very necessary to have the developing glasses very clean each time.

I will now give the details of a collodio-albumen process used by Mr. Schartzchild, a celebrated German photographer I met at Palermo. *He* took quite a pleasure in explaining it; but he was not satisfied with mere explanation, for he went through the whole preparation and development of the plates in my presence, in order that he might be thoroughly understood. I saw a great number of his negatives, and they were all first-class: he said he seldom or ever had a failure. Most of his pictures were on glasses about seven by six and a-half inches, so as to allow of two negatives being taken of each subject. I will now give the formula:—

The plate is first coated with old collodion, containing a little free iodine, and sensitised in a neutral bath of nitrate of silver, about twenty-five grains to the ounce; it is then washed in two or three changes of distilled water, and drained; then carefully covered in one wave with the following solution of albumen, which is run off, and then covered again for about half-a-minute with fresh solution, when it is reared up to dry thoroughly:—

Albumen	4	ounces.
Water	½	ounce.
Iodide of potassium	24	grains.
Gum arabic	30	,,
Ammonia	45	minims.

The plates in this condition may be stored for use. When wanted they are re-sensitised in an aceto-nitrate bath—

Silver	1 ounce	Saturated with iodide of potassium before adding the acetic acid—
Water	10 ounces	
Acetic acid	1 ounce	

nd wash as before. The exposure in sunshine is about two minutes for stereos., and developed in the same way as the albumen plates; clear with hypo., for cyanide is apt to raise the film in wrinkles. I think that a bromide and chloride added to the albumen would render the plate more sensitive to dark-green and red rays.

I obtained some very good pictures when abroad by this process, but have not tried it since I returned, always using wet collodion in preference; but I can strongly recommend it to lovers of dry plates, having seen magnificent pictures taken by it in Egypt, Turkey, Syria, and all the southern countries of Europe. The method of using gallic acid as a rapid developer is, I believe, novel here. I have seen several pictures treated so, and with great success.

THE CONSTITUTION OF THE SOLAR ATMOSPHERE AS REVEALED BY SPECTRUM ANALYSIS.

By Samuel Highley, F.G.S., F.C.S., &c.

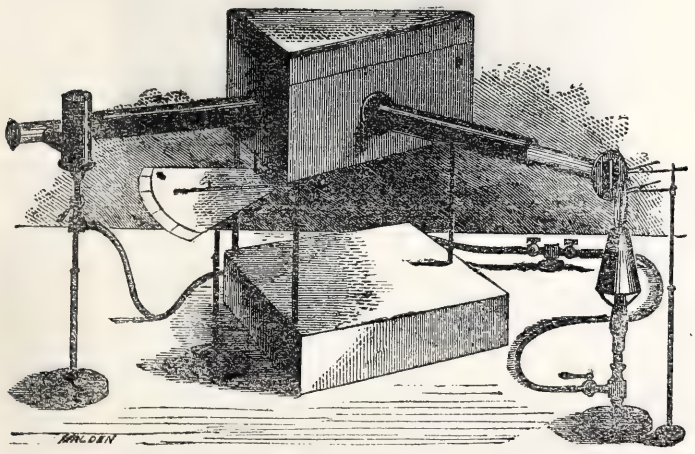
(Continued from page 362.)

The chief value, then, of Bunsen and Kirchhoff's paper *On Spectrum Analysis*, published in 1860, in *Poggendorff's Annalen*,* is to be found in the perspicuousness with which it places before the student, in a definite manner, the simplicity and extreme delicacy of this method of investigation; for, as already has been shown, English experimentalists had previously recorded exactly the same observations. Moreover, Swan had employed improved apparatus constructed on the collimator principle (as had Masson before him) the same as that described in their paper, and had even anticipated their estimations as to the extreme delicacy of the reactions, for he states† that one two-millionth and a-half part of a grain of sodium could be detected in the flame by its characteristic spectra.

The arrangement described at page 340 of this Journal for making spectrum observations would obviously be inconvenient for laboratory purposes, the slit being placed at many feet distant from the eye and hand of the observer. To obviate this a collimating lens is introduced between the slit and the prism, and an instrument of great compactness is the result.

It would be impossible to describe, in this place, the various instruments that have been designed by Mr. Crookes, Steinheil, and others; but we shall describe the instrument we employ, which combines with the model recommended by Bunsen and Kirchhoff, all important modifications suggested by others, so that it may be regarded as typical of the best form of spectrum apparatus.

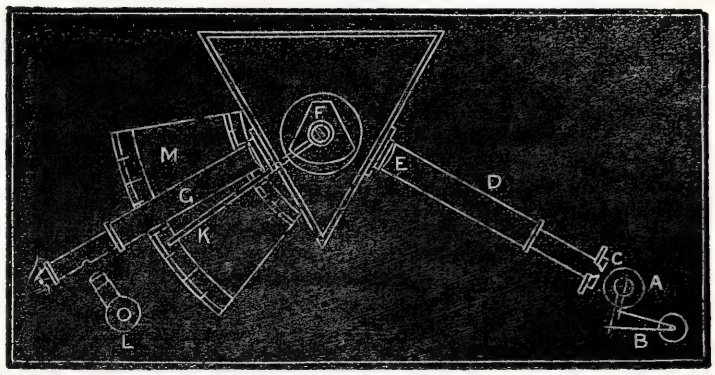
FIG. 3.



It consists of a triangular box, having the sides that carry the collimator and observing telescope placed at an angle of about fifty-eight degrees to each other, with a lid that shuts down light-tight. It is mounted on three stout legs, placed at the angles, that screw into sockets, to allow of the instrument being levelled. Within the box a "prism bottle," cut to an angle of sixty degrees, filled with bisulphide of carbon (a highly dispersive liquid), is placed on a table, fixed to a vertical pivot that passes through the bottom of the box at a point near where the axes of the telescope and collimator intersect. On the right-hand side of the box a single-draw telescope tube screws into a flange. This carries an achromatised collimating lens at the end nearest the prism, and a knife-edge slit on the draw tube. The slit consists of two pieces of brass, having their edges bevelled and accurately ground to a straight edge, so that when placed close together daylight may be perfectly excluded: these are mounted on pivots to a base-plate by a parallel ruler arrangement, so that, by the aid of a lever arm, these edges can be separated from each other from less than $\frac{1}{100}$th of an inch to the $\frac{1}{10}$th of an inch.

Into a flange, on the opposite side, screws a single-draw achromatic astronomical telescope, which should be furnished with two powers—one magnifying about four diameters, to allow of the visible spectrum being in view at one time, and another magnifying about 10 or 15 diameters, to allow of individual portions of the spectra being examined in detail. Opposite the slit the flame or induction coil is placed. The best flame for bodies that can be volatilised at a moderately high temperature is that of a Bunsen's burner. The jet should be made of Steatite (that metallic indications may be avoided) enclosed in a copper cone, both being mutually adjusted according to the directions given by Bunsen. As the flame of this burner gives a very high temperature, with but a slight amount of luminosity, it is well adapted for these investigations. The substance to be tested is made to adhere to a loop turned in a fine platinum wire, $\frac{1}{2}$th *millemetre* in diameter, that is held in the mantle of the flame, a little below the bottom of the slit, by means of a pincette stand, between the jaws of which the wire is grasped. On consulting the horizontal sectional diagram, *fig.* 4, it will be seen that the wires are held by the pincette B in the

FIG. 4.



flame A, which is placed opposite the slit C. An image of the slit is thrown by the lens E on to the centre of the face of the prism bottle F, from whence the luminous ray is refracted up the axis of the telescope G.

To put the instrument into adjustment the prism should be placed with its refracting angle towards *the base* of the triangular box, and turned on its axis till it stands in the position of a minimum deviation, the telescope and collimator having been previously focussed so as to secure a sharp luminous image of the slit. On looking through the telescope the spectra of the body undergoing volatilisation in the flame will be discerned, each band being sharply defined. If the telescope is a good one it will resolve the yellow soda band into two distinct lines with the higher power, when the slit is reduced to a very narrow aperture. To determine the position of any line for the purpose of recognition or reference various methods have been adopted. Bunsen aud Kirchhoff employed a small parallel mirror attached to the bottom of the vertical axis on which the prism table rotated: at some feet distance, and parallel to the mirror, a graduated horizontal scale was adjusted, so as to be reflected in the mirror; behind this a telescope was placed directed towards the mirror. On the axis of the rotating table a long lever arm (K *fig.* 4) was clamped, by the aid of which the prism could be turned to the right or to the left, and every line apparent in the spectrum be made "to cut" or coincide with a bright vertical wire placed down the centre of the eye-piece of the telescope. As the mirror turned with the prism every line could thus be indicated, as the slightest variation in the angle caused a fresh division of the scale to be reflected in the mirror, which was then read off by the supplementary telescope. As, however, this arrangement was cumbrous, and involved the necessity of working by daylight, I modified this arrangement by laying down a scale on a boxwood quadrant (M *fig.* 4), and taking the readings by allowing the lever arm (made in the form of a triangular bar) to traverse the scale with its sharp edge undermost, so that on turning the prism by aid of the lever, till any line in the spectra "cut" the wire in the telescope eye-piece, the lever also cut the symbols of the element laid down on the graduated scale, and thus indicated the body undergoing volatilisation; but I found the most convenient way was by aid of a camera lucida attached to the end of the eye-piece, adjusted to a scale, made from a photograph,

* Bd. ex. S. 161.

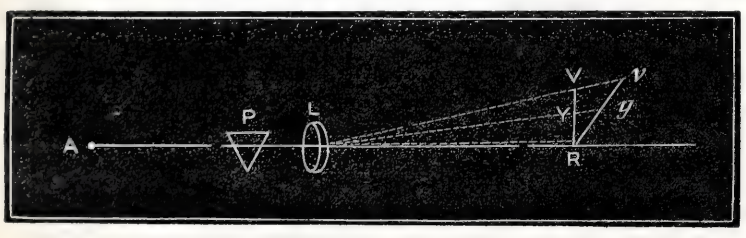
† *Philosophical Transactions.* Edin. XXI. p. 411.

placed beneath it. When working at the violet end of the spectrum, with this arrangement, the luminosity is so greatly reduced that the wire in the eye-piece is undistinguishable: it is therefore necessary to illuminate the wire by means of a little gas lamp (L *fig.* 4), the burner of which is enclosed so that the eye of the observer shall be shielded from its glare, whilst its rays, collected by a lens fitted into a side tube, are thrown upon the wire through a hole cut in the eye-piece and inner tube of the telescope. This hole in the telescope is closed by turning the eye-piece till it ceases to coincide with the aperture in the outer tube. Others have employed a screw micrometer, comparing the position of the spectra with the lines of the solar spectrum; but the best method is that introduced by Steinheil, though it involves the necessity of working by bright daylight, namely, placing a small prism over one-half of the slit, and either by refraction or, as in an instrument of Miller's, by reflection, turning the solar rays (reflected from a heliostat placed at the side of the slit) down the axis of the collimator, whilst the Bunsen burner or coil is placed opposite the uncovered half of the slit. By this means the lines of any spectra can be compared with those of Fraunhofer, as they stand in juxtaposition one over the other, being only separated by a narrow line. By this simple means also the spectra of two different bodies can be compared one with another with the greatest facility, and many changes may be rung in this method of manipulating. To allow of Gladstone's method of observing the absorption spectra of liquids in a wedge-shaped vessel, the slit should stand vertical, but in some instruments it is placed horizontally; this, however, tends to detract from their general applicability.

Other methods have been adopted for traversing the field of the spectrum, and bringing particular lines into the centre of the eye-piece, besides Bunsen and Kirchhoff's arrangement. Steinheil adopts the plan originally employed in the goniometer of Babinet, viz., attaching the observing telescope to an arm that works in azimuth round a central axis; in fact, with the exception of the refracting prism placed over the slit, his instrument is essentially a Babinet's goniometer. It will be seen, however, that whether the prism, or the telescope, or the collimator be rotated, it must infringe upon the original adjustment of the prism at its angle of minimum deviation in its relation to the position of the telescope and collimator. To obviate this, Mr. Crookes has suggested that the slit itself should be made to traverse in a plane parallel to the face of the prism. This he effects by a screw movement, and it answers admirably.

With regard to the best arrangement of the optical parts of the instrument, having observed in Brewster's *Treatise on Optics* that he employed, for his spectrum observations, a telescope made by Dolland, according to a formula furnished by Sir John Herschel,* we wrote to Sir John for the particulars of this telescope, and our note called forth the communication appended to this article in this page. With his usual courtesy, Sir John Herschel likewise favoured us with his views as to the optical arrangement best suited for a spectrum apparatus, which we give in his own words:—

"I cannot perceive any advantage to be gained for viewing the spectrum lines by the use of a lens such as you allude to (one which destroys spherical but *not* chromatic aberration) over that of a good *ordinary achromatic* which destroys both, *certainly not such as to justify any* EXTRA *expense or trouble* to have one made when any good telescope object-glass of two or three inches aperture would answer equally well.



"Suppose L to be *such* an object-glass (achromatic), then the image of a white point A, the rays from which pass through a prism P, will *(if at a distance greater than the focal length of the lens)* form a coloured linear image V Y R capable of being viewed by an eye lens which, *being supposed achromatic*, will show all the colours and their deficient lines distinctly in order as so many coloured images (or non-images) of it; and V Y R will be a line *at right angles* to the axis of collimation of the lens.

"But if the lens L be not achromatic, but correcting only for the spherical aberration, from focus R for red rays coinciding with that of the achromatic lens, that of violet *v* will be more distant than R, and so for the other colours; so that the image formed will be a coloured line, R *y v* forming an angle V R *v* with V R, and *not* perpendicular to the line of collimation.

"This will, however, by no means prevent distinct vision of the *lines* by an achromatic eye lens, only the eye-glass must be readjusted for each particular line of that particular refrangibility.

"If the *eye lens* be not achromatic the same holds good. Only *observe* the magnifying power will not be alike for all refrangibilities, and any micrometric measures which may be taken from line to line will require a correction. This correction, however, is easily calculable.

"By an 'achromatic eye lens,' I do not mean an *eye-piece* achromatic in *the eye-piece sense* of the word [see Airy on Eye-pieces], but a compound lens of flint and crown achromatising an image formed *in its axis*."

In the instrument described above, the legs, telescopes, lever, &c., when not in use, pack in the body of the triangular box, and can then be put under lock and key, otherwise the box might be greatly reduced in size.

(To be concluded in our next.)

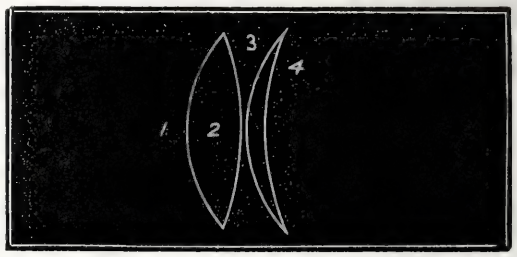
* See *Optics*, page 95.

ON FORMS OF LENSES SUITED FOR DESTROYING SPHERICAL ABERRATION.

By Sir JOHN F. W. HERSCHEL.

As respects the particular form of lens Sir David Brewster used for the examination of Fraunhofer's lines, not having his work on optics by me I cannot refer to it; but, I suppose, when he says the telescope was made "according to a formula of Sir John Herschel's, in which the spherical aberration was corrected while the aberration of colour remained," that he must mean a double lens (described in my paper referred to below), in which the radii of the surfaces (both lenses being of crown glass) are—

First lens: Focal length	= 10·00
Radius of surface, 1	5·83
,, ,, 2	— 35·00
Second lens: Focal length	17·87
Radius of surface, 3	3·69
,, ,, 4	6·29
Focal length of the combination.....	6.41

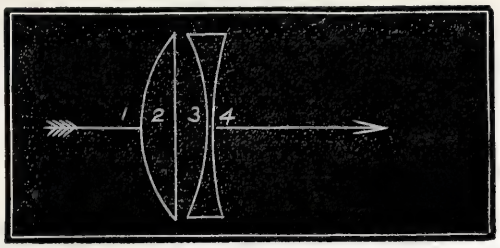


A lens of this sort of three inches aperture and five inches focus I found to give an image of the sun sensibly free from spherical aberration, and to act as a very powerful burning lens (for which only it was intended).

But I regret to say that I fear I have unintentionally misled Sir David Brewster in reference to the radii of the surfaces of a double crown lens corrected for spherical aberration. Your note having recalled the subject to my notice, I have been again looking over the subject, and I have detected an error in one of the *numerical* coefficients of the formula I worked on (see *Phil. Trans.*, 1821), where, in section 10 of my paper on object glasses, the value of β instead of $+ \frac{8}{9}\frac{2}{7}$ there set down should be $+ \frac{1}{2}\frac{4}{7}$, which vitiates the subsequent conclusions so far as a combination of two lenses of *crown glass* is concerned, and renders the radii above given inapplicable. In point of fact the spherical aberration of a convex lens requires for its exact correction a lens of a concave character, of inferior power; and I only wonder that the lens I had constructed for a burning glass on those radii worked so well as it actually does. Had it been otherwise, I should have been led by its bad performance to re-examine carefully all the steps of the calculation, and the error must have been detected. I have still the lens by me, and it gives a clean and perfectly defined focal image of the sun, with a remarkable freedom from loose light when thrown upon a white screen.

The following combinations, in which the spherical aberration for glass of refractive density 1·500 is corrected, are computed with the *correct* value of β. They all suppose a compound focal length = 2, and a convex resulting character of the combination.

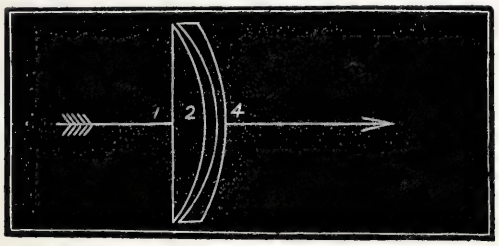
COMBINATION 1.



1st lens.—Plano-convex; convex side towards the light.
2nd.—Double concave.

Surface	Curvature.	Radius.	
1	2·0000	0 5000	Focal length of
2	0·0000	∞	1st lens + 1·0000.
3	—0·7932	—1·2607	Focal length of
4	+0·2068	+4·8356	2nd lens — 0·5000.

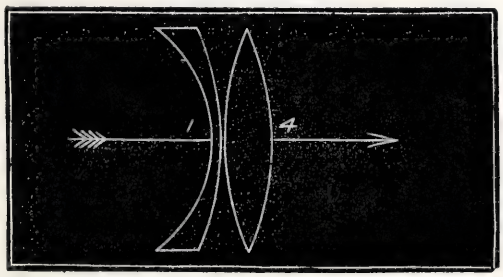
COMBINATION 2.



1st lens.—Plano-convex; plane side towards the light.
2nd.—Concavo-convex; concave side towards the light.

Surface.	Curvature.	Radius.	
1	0	∞	Focal length of
2	—2 0000	—0·5000	1st lens + 1·0000.
3	—2·1811	—0·4585	Focal length of
4	—1·1811	—0·8467	2nd lens — 0·5000.

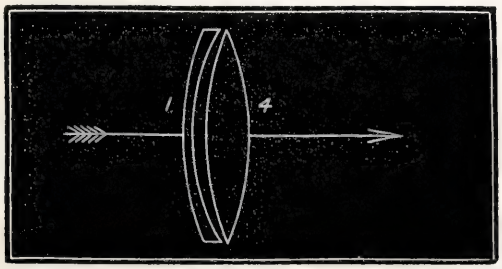
COMBINATION 3.



1st lens.—Concavo-convex; concave side next the light.
2nd.—Double equi-convex.

Surface.	Curvature.	Radius.	
1	—2·1606	—0·4628	Focal length = — ½
2	—1·1606	—0·8616	
3	+1·0000	+1·0000	Focal length = + 1
4	—1·0000	—1·0000	

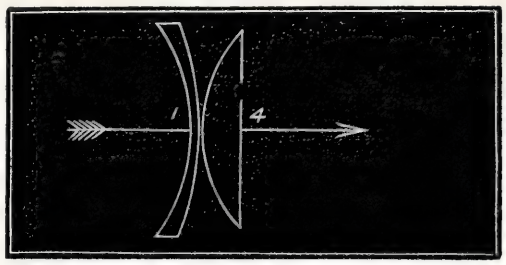
COMBINATION 4.



1st lens.—Convexo-concave; convex side to the light.
2nd.—Double equi-convex.

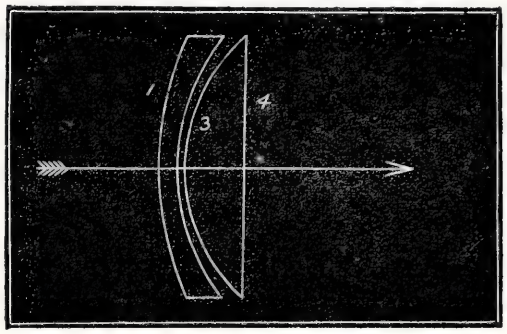
Surface.	Curvature.	Radius.	
1	+0·4463	+2·2406	Focal length = — ½
2	+1·4463	+0·6914	
3	+1·0000	+1·0000	Focal length = + 1
4	—1·0000	—1·0000	

COMBINATIONS 5, 6.



1st lens.—Concavo-convex, or convexo-concave.
2nd.—Plano-convex; convex side to the light.

Surface.	Curvature.	Radius.		
1	—2·5	$+\frac{1}{1\frac{1}{4}}$; $-\frac{2}{5}$	or	$+\frac{1\frac{4}{7}}{1\frac{1}{1}}$
2	—1·5	$+\frac{2\frac{5}{1\frac{1}{4}}}{}$; $-\frac{2}{3}$		$+\frac{1\frac{4}{7}}{1\frac{2}{3}}$
3		+ 2·0		+ ½
4		0		∞



To conclude, I should observe that the error above alluded to affects only the computations of combinations of two crown glass lenses, and no way affects the general theory and formulæ for achromatic object-glasses delivered in the paper referred to. In that paper, should you have occasion to refer to it, the equation in section 10, $\beta = +\frac{3\frac{3}{7}}{}$ should be $\beta = +\frac{1\frac{4}{7}}{}$. In the subsequent expression for the aberration, the coefficient $-(32a' + 66b')$ should be $-(14a' + 66b')$, and in the value of X, the term $+(33-49h'^2)\,x^2$ should be $+(33-40h'^2)\,x^2$. In section 10 the equation $X = 0$ should stand thus: $7x^3 - 7x^2 + 13x + 2) = 0$.

There is also a misprint of some consequence in the value of Q 2 in section 8, the sign of which should be negative, but this is only a misprint, and does not affect the result.

PHOTOGRAPHY IN 1861.—In some branches we may find ourselves behind the German group of peoples. Take the new art of photography for example. Our famous practitioners will be extinguished if they do not strive harder than they have lately done to compete with the photographic productions of Vienna, of Berlin, of Dresden, of Brussels, of the Hague, and of Aix-la-Chapelle. Some of the large specimens from these places have been well described as being, in appearance, grand paintings in sepia. A letter on this subject in the *Journal of the Society of Arts*, though tending to place photography above its true position with respect to pictorial art, ably sets forth the merits of Continental photographers, and especially of those in the northern capitals of Europe. Size and grasp of subject are joined to a delicate minuteness and a perfectly accurate focus. In the last-named particular the freedom from any distortion is remarkable with most of these large pictures. Their accuracy will best be ascertained by regarding architectural subjects, which have long straight lines parallel with and near to the margin of the photograph. It will be seen that these lines do not diverge in any appreciable degree, as they would do if great skill and care were not exercised in the use of a very large lens. Though it is not so easy to verify the exactness of proportion in the features of a human portrait, we may reasonably infer an equal amount of precision, when a practitioner has given such proof of ability as may be tested at a glance. We have taken but one subject in illustration of our argument, that the year 1862 will bring us into an arduous competition with countries whom we have, in great measure, taught to vie with ourselves. The power which Englishmen have created, and launched abroad, must not be turned against them at last. It will never be so if they will be true to their best interests and to their old renown.—*Daily Telegraph.*

SUGGESTIONS FOR OBTAINING POSITIVES IN GOLD UPON GLASS PLATES.

By W. J. Miers.

The following process may, perhaps, not only interest some of your readers but also offer a new and useful application of photography to ornamental and manufacturing purposes. While experimenting on the comparative effects of the different intensifying processes on negatives, in using the chloride of gold, it occurred to me whether it would be possible to abstract the silver from the collodionised surface and, subsequently, reduce the gold. As to whether the gold would be present in sufficient amount to produce a presentable positive in that material, a few trials convinced me of the practicability of my suggestion.

The method of proceeding I adopted was this:—Taking a positive or negative with clear lights the surface was first wetted and then flushed over with a solution of chloride of gold, of a light sherry colour, several times, until the maximum intensity was obtained; the plate was then thoroughly washed, slightly drained, and then immersed in dilute nitric acid (about acid one, water two parts), or the acid may be poured on, as in developing, for one or two minutes.

The plate is to be rinsed, then drained for a few seconds, and a strong solution of ammonia poured over it for about half-a-minute; the plate is to be again rinsed and the nitric acid applied, also the ammonia, taking care to rinse between the operations, which, if repeated three or four times, will clear the plate of any visible traces of the silver picture; nor will the picture, when viewed by transmitted light, now present any indication that the silver forming the picture at the commencement of operations has been dissolved away—yet in the subsequent stage of the process the lightest shades of the positive are found to be reproduced in another material. The plate is then to be dried carefully and subjected to some operation for reducing the black, precipitated gold to its proper colour; and this is the point which I did not work out. Before I could do so I was drifted by events from experimental pursuits such as these. There are, however, many ways of effecting this reduction, as phosphorous in the presence of aqueous vapour, sulphurous acid, &c.; but the readiest was putting the glass in a kind of muffle in a common stove, making it red hot, for a few minutes, and withdrawing it very gradually to prevent the glass from cracking. The necessary apparatus can be readily made by taking a piece of iron, about the thickness of half-a-crown, rather larger than the glass, spreading upon it some whiting about 1-16th or 1-8th of an inch deep, the surface of which is to be pressed quite flat and level with a piece of board or glass. The picture is then to be laid on the whiting, face upwards, another piece of thin iron slightly bent, so as not to touch the face of the picture, is to be placed on the top. This iron is to be rather wider at the side and bent so as to clip the under side of the thicker iron plate, forming a kind of cover open at both ends, through either of which the thicker iron and picture may be inserted or withdrawn. This may be placed on an ordinary fire, if burning clearly, and allowed to get red hot; and if withdrawn gradually and kept from draughts the glass will seldom crack. But in a great many of my experimental plates the glass was merely clipped by a piece of soft iron wire wound round it and held in the hollow space of a clear fire for a few seconds until red hot, not allowing the glass to lose its shape by keeping it too long in the fire.

The precipitated gold forming the picture will now be found changed in colour from an ugly, dense, slaty, black, to its natural colour, approaching somewhat the well-known appearance of water gilt-work in ormolu; but the colour is not always pleasing, having at times a slight red tinge. As far as I can recollect, however, this depends on the strength of the gold solution, a weaker solution producing more favourable results. But as it is more than three years since I have experimented on the subject I am not quite certain on this point. I have very little doubt in my own mind that if this part of the process were more fully worked out, perhaps, by some of your numerous readers competent to undertake the task, some highly successful results would be obtained—perhaps the opening out of a new branch of practical photography in a useful and advantageous direction.

The effect of the gold in portraiture I consider anything but pleasing; but in small sizes (as locket size) this is not so obvious: many, perhaps, would pronounce in their favour. It is for ornamental purposes that I conceive the process may be usefully applied; and it is very easy to combine the two effects of gold and silver on the same surface by gilding first, using two negatives, one for each operation, arranging and blocking out the parts so as to avoid the interference of one process with the other, while with the further and appropriate addition of colour novel and pleasing effects might be produced unattainable by any other means.

By way of caution I should recommend those who do not meet with success at first to try again, and to make their own chloride of gold, as that obtained at some places, and used for colouring paper positives, may not always suit for this purpose.

STEREOGRAPHS.

Instantaneous Views, photographed by William Hanson, *Leeds.*

Instantaneous photography is a branch of the art in which much has been already accomplished, while more looms in the future. In its practice it is one most trying to the patience, because in skilful hands the approach towards everything that can be desired is so far attained that the artist is constantly spurred on to yet one more trial, in hope that the trifling defect which has spoilt his preceding attempt will be avoided in the next one. The fact is, that to produce something fair in this direction is easy enough; to produce something good is very difficult; while to produce something perfect demands little short of a miracle for its accomplishment.

The successful practice of instantaneous photography requires qualities in the operator that are found combined in but few individuals. He must be an artist in the highest sense of the word or his productions will be utterly valueless. It is his aim to fix the transient effects which pass away swiftly as the smile from the face of a child. The subjects worthy of his attention are precisely those which exist only for a moment—"which come like shadows, so depart." The street and river scenes, for instance, are the mere accessories of his pictures. It is the rippling wave, the changeful clouds, the surging crowds and prancing steeds, ever being grouped and re-grouped—now in mere disorder, now in picturesque confusion—that form the real subject of his studies: hence it is not the successful delineation of a well-chosen view that will satisfy his exigeant conditions, but it must not be spoiled by the disorderly grouping of the living elements, or by the want of balance produced by the untoward phases of the other moving portions of his subjects. Besides all other demands, that of time is more exacting than all the others put together. The instantaneous operator, therefore, must have a quick eye for observation, should be free from nervous excitement, should have considerable knowledge of chemistry, and possess the power of delicate manipulation.

It is evident from the specimens before us that Mr. Hanson possesses a fair share of all these requirements. We cannot truly assert that, as a whole, they equal the best of Mr. Wilson's productions; but we can honestly say that many of them he would not be ashamed to own, while all evince a very large amount of care and skill employed in their delineation. There are two views of Sackville Street, Dublin (No. 509), both taken from the same spot, and differing only in their animated portions. In one the natural clouds are perfect and distinct, probably owing to a slightly longer exposure, but the figures in the foreground have consequently suffered somewhat: in the other the passengers are admirably delineated, and both are really good.

A Scene on the Mersey, Blowing off Steam (No. 517), is a truly artistic production, and one that would be honourable to any photographer, possessing, as it does, the most complete harmony and gradation of tone throughout, while the sky is a perfect study of itself, presenting that indefinable charm which we can best express by the term "poetical." The white cloud of steam from the vessel is well relieved against the darker portion of the sky, and its graceful outline is in excellent "keeping" with the natural clouds.

Dropping Anchor (No. 516), another scene on the Mersey, is equally good in execution; but, though the natural clouds are in this also perfectly delineated, they entirely lack the picturesque charm of grouping noticed in the preceding, while the view of The Great Eastern (No. 515), excellent as it undoubtedly is, appears to have been taken during an impending storm.

The Royal Irish Mail Steamship leaving Holyhead (No. 504) is a striking picture, though a trifle under-exposed, and forms a singular contrast to No. 517. In this the sky is of an uniform light grey tone, against which an enormous cloud of dense black smoke, in grotesque contortions, is vomited forth from the four funnels of the steamer. It is, of course, this mass of smoke which forms the real subject of the picture, though it would scarcely do to designate it by such a title as "mass of smoke."

Several Welsh scenes possess points of interest, though in some

the outline of the mountains cuts painfully hard against the sky, especially those of Llanberris and Nantle. But in

SNOWDON, FROM LLYN-Y-DYWARCHEN (No. 514), the hard outline of the nearer portion makes a telling contrast with the distant one, where the rolling mist obscures it in its cold and clammy embrace. Similar observations apply to No. 513, THE VALLEY OF NANTLE, WITH SNOWDON IN THE DISTANCE.

THE SOUTH STACK LIGHTHOUSE (No. 505) is a very telling and pleasing subject, well executed: the bluff, bald, broken rock, against which the sea washes, breaking into foam, is crowned with the pillar-like lighthouse, round the base of which a few cottages are clustered. The sea and sky, nicely blending at the horizon, form a fitting background; and the numerous foam-crested waves of the former break the monotony without disturbing the attention. This is an excellent slide.

Of a similar class are two VIEWS OF THE ANGLESEA COAST (Nos. 506 and 507), one looking northward and the other southward from the South Stack Lighthouse. Both are excellent, and form a very charming pair of subjects—closely allied, yet well contrasting. THE BRIDGE CONNECTING THE SOUTH STACK ROCK WITH THE MAIN SHORE, near Holyhead (No. 75), is picturesque; but, owing to a little over-development, it is not equal in execution to the others named.

Such a production as the one on which we have particularly dwelt, No. 517, would alone be sufficient to establish the reputation of a photographer; but Mr. Hanson has proved that his skill is not dependent merely upon fortuitous circumstances. It is not possible to command such exquisite combinations of natural objects at will as those which we find grouped in the picture to which we make allusion, but none but an artist would have seized the happy moment for recording them; and in the other subjects mentioned we have nothing to allege against the manipulation. We hail Mr. Hanson as an acquisition to our list of artist-photographers, and heartily wish him success.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

SUBORDINATION *(continued)*—THE PRESENCE OF MINUTE DETAILS ESSENTIAL TO SUBORDINATION AND TO TRUTHFULNESS—SYMMETRY PRODUCTIVE OF SUBORDINATION—HARMONY THE RESULT OF SUBORDINATION—THE PRINCIPLES OF HARMONY—CLOSE RELATIONSHIP BY WHICH THE RULES AND PRINCIPLES OF ART ARE HELD TOGETHER—SEASONABLE QUOTATION.

"It cannot be by chance that excellencies are produced with any constancy or any certainty, for this is not the nature of chance; but the rules by which men of extraordinary parts, and such as are called men of genius, work, are either such as they discover by their own peculiar observations, or of such a nice texture as not easily to admit being expressed in words, especially as artists are not very frequently skilled in that mode of communicating ideas."—*Sir J. Reynolds.*

"Our friends—that is, some of them—say that rules are the fetters of genius, &c., &c., as though it were possible to find anything upon the earth, in the sea, or in the heavens, that may be said to be independent of rules!"—*J. B. Pyne.*

"Without *rules* there can be no *art*, any more than there can be a *house* without a *door* to conduct you into it."—*Dryden.*

"Learn hence for ancient rules a just esteem:
To copy nature is to copy them."—*Pope.*

MY DEAR FELLOW-STUDENT,

In the remarks with which my last concluded, I said, in reference to the relative proportions of parts as affecting subordination, that where from their extreme minuteness the painter or draughtsman was unable to describe such of their proper size, he wisely omitted them. Photography, however, does not leave its professors thus powerless under such difficulties: in its productions the lens records so faithfully and so perfectly even the minutest details of the smallest objects, that when we place any portion of our pictures under the microscope we see all the exactness of reality in parts which, to the unassisted eye, were previously invisible. Thus it is that while the painter aims at the *effect* without attempting to suggest the *cause*, both cause and effect are as closely united in the photograph as in the scene itself; and, without violating the truthful character of the whole, by proportions at variance with the selected scale, *subordination* and the real appearance of the actual scene is at once secured.

I am here reminded of the frequency with which certain artists and critics have denounced in photography this very quality, contending that the presence of these minute details sufficed to *destroy subordination*, and *ruined truthfulness of effect*, whereas, as I have briefly endeavoured to show, no greater source of real gradation, subordination, and truthfulness could exist than this selfsame photographic power of rendering the effect of nature with nature's own means, and realising the truths of a scene by reproducing every element of its natural appearance. But, as that truth-lover, Hogarth, said:—"The poor artist, if but able now and then to correct and give a better taste to some particular part of what he imitates, *by having learnt to do so from her more perfect works, or copying from those that have*, too frequently grows vain upon it, and fancies himself a *nature-mender*—not considering that even in these, the meanest of her works, she is never destitute of such lines of beauty and other delicacies as are not only beyond his narrow reach, but are seen wanting even in the most celebrated attempts to rival her."

I think we may now conclude that the preservation of minute details are essential, both to subordination and to truthfulness, provided only that such are in their just relative proportions to the scale of the complete scene, or, in other words, do not occupy a disproportioned share of the space allotted to the whole.

Symmetry is closely allied to *proportion*, and, by indicating the proper degrees of subserviency in parts as affecting the whole, must so necessarily be associated with this law of *subordination* that we need not here devote more time to its consideration. *Harmony* again owes its existence largely to *subordination*. As musical sounds produce certain natural effects upon the ear, and as colours perform a similar office upon the optic nerve, so tones, *in their degree*, are, by the same means, productive of harmony. Harsh contrasts are, in either case, offensive, whether it be in music or colouring, or mere monochrome effects, as, in either case, the soft gradual transitions of musical notes, or colours, or monochrome tones, are pleasing. "The general principles of harmony are uniform throughout the whole science of æsthetics; and, as in no department of that science have their effects been more clearly developed than in music, there can be no better method of pointing out their peculiar nature than by reference to the first principles of that art."* The harmony that delights the ear begets no less pleasure when translated into the language of the eye; and just as colours may represent notes, so may tones represent colours.†

A good engraving, or a good drawing in sepia, crayon, or india-ink, requiring all the delicate gradations of light and shade, will forcibly suggest to the mind all the effect of colour; and, so well is this fact recognised among artists, that you will frequently hear them say of such uncoloured productions that they are "*full of colour.*" The truth is, that the colours of nature are so closely associated with their tones that the same ties unite them as intimately in the mind of the spectator; and thus when we see some fine engravings of a sunrise or sunset, after a Claude or a Turner, where the luminous flood seems to sweep not only over the more powerfully-lighted passages, but even over the shadowy masses which, by contrast, give them brilliancy, we feel, if we do not see, the rich golden glow of the descending sun, and the grand autumnal hues of the decaying day, although there may be nothing before us save various tints and shades of white and black. I shall have more to say of this anon, when we come to consider "*sentiment*" and "*tone*" of themselves, and I merely introduce these suggestions here to give value to my present subject, viz., subordination, as one of the means by which such effects are to be secured.

The whole notes of music and the primary colours of painting find their representatives of a lower degree in the pure black and the pure white‡ of our own monochrome productions. Now, as it is evidence of crude uncultivated taste when we see the natives of barbarous lands delighting in the harsh, unbroken sounds of their rude instruments, or the no less harsh and unbroken character of their few bright pigments,§ so monochrome productions, which destroy harmony by masses of unrelieved black or unbroken white, may be compared to such, and denounced as wanting *the harmony of a proper subordination*, which, by demanding that very little pure white or black shall exist in a picture, therefore tends to produce harmony by introducing the demi-tones and gradations by which these two extremes are united, as well as aiding the other important principles urged in my preceding letters, by heightening the

* Hay, F.R.C.S.

† Ocular harpsicords, in which colours took the place of notes, were once exhibited to show how closely harmony of sounds and colours are united.

‡ That is to say in their highest light and their deepest shadow.

§ H. Warren, in his little work on colour, says:—"In the upper district of the Nile, the Nubians of Ethiopia, above the second cataract, the inhabitants vary in colour—in shades of colour—although all are considered by us as black men. * * * Were one of these people to be, in the un-European simplicity of their habits and thoughts, asked to specify or define the three grades, he would say of the first—being the blackest—that he were a *blue* man; of the second, that he were a *red* man: but, mark! now comes the point—the third he would describe as a GREEN man; simply because being neither a red or a blue, he has no other colour left of his category."

points of effect and keeping the eye of the spectator properly employed, instead of allowing it to wander in a loose, vague, unsettled way over the picture's entire surface, and quickly out beyond its boundaries. In thus urging the importance of subordination in connexion with the various parts of a landscape, you will have observed how this, like all other rules of art, appears closely connected with other principles known under the terms of *Repose*, *Breadth*, *Harmony*, *Proportion*, *Symmetry*, *Aërial Perspective*, &c.; and I hope yet to show that, although varying in name and performing varied duties, all these rules of art tend to one end, and are all but members of one strongly and closely united family.

In quitting this great principle of art, and turning to some others yet to be defined, it will be as well if I commence a new letter with my new subject. But, before closing the present epistle, I will just add a few lines in reference to some recently-published remarks, intended by their author either to deter photographers from the study of artistic principles altogether, or to denounce the advocacy of such in any pages but the writer's own, although in such pages no such subjects have yet received *serious* notice. Whether there is anything of the "dog-in-the-manger" feeling displayed in these remarks or not I leave you to decide; but I remember a certain capital little work *On the Positive Collodion Process*, in which the vital importance of artistic study received the most ample recognition, together with the lion's share of the little book's few pages, and in which some very sensible and practical, although by no means original, remarks on the subject occur, and in which it is said that "photographic portraiture (at any rate) is not a mere mechanical art. *It involves the application of certain principles of art, the knowledge of which is essential to success.*"

I will reply in the words of J. B. Pyne, quoted from that excellent artist's "Letters on Landscape" in the *Art Journal* for 1846.

"Amongst those who are prone to argument five out of six may be said to be more bent upon overcoming their antagonist than developing any great truth that the subject under discussion may contain, and particularly if such truth may have in it anything capable of overthrowing any particular and favourite theory. And full five out of six of those persons who are incapable of mastering the intricacy or complication of a question of art would, I fear, be very much inclined to pronounce any attempt at placing its causes and effects, its principles or rules, in anything like rational form, as so much sheer humbug, if they would not even assign the production and certain and consistent reproduction of great works to unassisted intuitive talent, genius, and inspiration."

Rather *apropos* isn't it, my dear fellow-student? But you must remember that these are not the words of, yours, very truly,

ALFRED H. WALL.

ERRATA—In *An Artist's Letters to a Young Photographer*, in the second column of page 368, for "It is clearly an impossibility to represent such minute," &c., *read* "It is clearly an impossibility to represent by any than the photographer's means such minute," &c.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By JOHN CRAMB.

No. X.

BETHLEHEM—CHURCH OF THE NATIVITY—INDUSTRY OF THE PEOPLE—FEMALE BEAUTY—HEBRON—THE TOMB OF ABRAHAM.

NEXT after Jerusalem the most interesting place in the Holy Land, to the Christian, is Bethlehem, and the central object of attraction in it is the Church and Grotto of the Nativity. That the modern Beet Lahm is the true scriptural Bethlehem of Judea there is not the slightest doubt: nor should there, we think, be much in regard to the site of the Nativity. The place which has received the title for, at least, some sixteen hundred years, and which has been visited and written about during every century, should not be readily denied that respect which we are disposed to pay to the humble birthplace of Him "who spake as never man spake." I have no patience with the spirit manifested by some recent Protestant, particularly Presbyterian, travellers in Palestine. I had the company of an American Presbyterian minister who could not disguise his scepticism regarding the traditional holy places at every turn. I went to the Holy Land with much of this feeling imbibed from those who should have taught me better; but my convictions have never allowed me to sneer at anyone's belief, whatever it may have been. Perhaps that habit of thought saved me from acting as I have said too many of my co-religionists do in regard to such places as the site of the Nativity, of the Garden of Gethsemane, and the Holy Sepulchre. Under the impression that there were such localities as the holy places in Palestine, and that the title "Holy Land" was not a misnomer, I considered that the application of photography in obtaining reliable pictures of those sacred spots for such as could not themselves visit them, was in reality an honourable and worthy undertaking. If there were no such places to make pictures of, then the whole thing sank into a piece of religious humbug, and should be allied with the mere manufacture of doubtful relics. That there may be something of the spurious mixed up with the real and true in what one is asked to believe in regard to the holy places I at once admit; but that is no reason for wholesale scepticism or continual sneering. A Scotch Doctor of Divinity, who has written the description for some of the views that I took, has fallen, I think, into a grave error in the fulfilment of the task assigned to him. The picture purports to be the picture of so and so: the learned doctor's description says in several cases that "there is not the smallest reason for connecting this place with" so and so. This I esteem an insult to the purchaser of the picture. I am the more induced to mention this circumstance, as in the description written by me I have either carefully avoided giving an opinion, or have frankly acknowledged my belief in the truth of the tradition which connects the place represented with the event or thing with which it has been so long associated.

Bethlehem is one of the most thriving villages in Palestine. It contains, it is estimated, about 3,000 inhabitants. They are all Christians. The remnant of Moslems which remained in it was rooted out by Ibrahim Pasha during his brief occupation of Syria. The people of Bethlehem are said to be very turbulent. I can speak more decidedly to other qualities as having come under my own observation. They are most industrious, doing, indeed, a large part of the work of Southern Palestine. Everywhere one finds Bethlehemites plying every industrial craft, and the sound of the shuttle, the anvil, and the lathe are as common in Bethlehem as they are rare everywhere else in the country.

The women of Bethlehem are generally fair and always beautiful. Every traveller remarks that; and, I believe, their beauty is celebrated throughout the east. I may remark that I thought some of the men fine models of humanity. Sincerely did I regret the arrangement that denied me the pleasure of bringing home witnesses to the correctness of my judgment on this point. But I was not expected to spend my time on such subjects, though I now think it a pity that I was so scrupulous in the discharge of my duty.

The object of supreme interest in Bethlehem, as I have before observed, is the site of the Nativity of our Lord. It is a grotto, having a splendid church erected over it, and several other grottoes clustering around, as might reasonably be expected. One of these, called the Grotto of Saint Jerome, was beyond controversy the residence of that father of the Church for many years. I cannot, of course, in the space allotted to me describe the various buildings forming what goes under the title of the Church and Convent of the Nativity. Each of the three great sects of Christians—Greek, Latin, and Armenian—have chapels in it, the Grotto of the Nativity being common to all. In the floor of this grotto there is fixed a silver star, and round it, in the same metal, are the words—"HIC DE VIRGINE MARIA JESUS CHRISTUS NATUS EST." Near it a plain altar is erected, which each sect decks out with what it deems necessary for the due performance of its devotions. When I visited it a priest of the Greek Church was lighting and trimming numerous lamps, and arranging the other religious ornaments his creed required. Of course I could make no picture of this place, but I shall not soon forget its appearance.

Before taking the view of Bethlehem, for which I was waiting, I went a little below the Convent and took a view of the plain where "the shepherds were watching their flocks by night" when the angel of the Lord appeared to them with "good tidings which shall be to all people." This makes a fine landscape; and but for the white sky which the publisher demands, and which is easier to be out of the way than to be put in, would, I think, be a fine picture.

After taking all the views on which I had fixed I returned to the Holy City, and developed some the same evening—others several days after. I found no difference between those I developed at once and those I postponed in this case; though at other times I did, and rather preferred to finish my pictures as soon as possible, generally.

The temperature at this time was usually about 85° in the shade, and 120° to 130° in the sun. During the months of July and August the thermometer seldom fell below 95° in the shade, and generally stood about 105°, while in the sun it rose to 160°! It was pleasant to ride under that heat for eight or nine hours! Any tendency to decomposition in excited plates was soon shown under

such circumstances. I may say that every plate I exposed in this Bethlehem trip has been published, and that was frequently the case with me. That speaks favourably, I think, of the certainty of the process I practised.

In my next article I will give an account of my visit to the Dead Sea and Jordan, where I was less successful, though more successful than several *wet-plate* operators who had preceded me. I am quite sure, from my own experience, that a good dry process is best adapted to the requirements of such a journey as I was on: yet, I dare not presume to doubt the possibility of being successful with a wet process; but to be so would be much more difficult.

It was some time before I could arrange to start for Hebron, and by the time I could do so the danger of travelling in the country had much increased—or at least the fear attached to so doing had increased, in consequence of the news of the frightful massacres in the Lebanon. The people of Hebron are very bigotted Moslems, and have the reputation of being turbulent and lawlessly disposed. I arranged to prepare my plates in Jerusalem, and to develop them on my return; and, as I particularly wished to be in Jerusalem in two days from the time of starting, I purposed remaining only one night from my residence in the Holy City.

I had arranged to leave early, but my muleteers had no such intention, so it was nearly eight o'clock before I was clear of the Jaffa Gate. The same perverseness which made us late in starting kept us long on the way, so that the light was far gone before I got in sight of Hebron. What a lovely place it is! How beautifully the city stands, protected on every side, in the luxuriant valley of Eschol! Who will say that this land is cursed? Look at those grapes! It is a garden!—a land waiting for the smallest amount of labour to produce the most abundant crops!

It was half-past five as we walked our horses at a leisurely pace through this fruitful valley. I hastily dismounted when we had arrived opposite the Sanatorium, our proposed camping ground for the night. My Nubian soon had my camera unloaded, and I at once proceeded to take a view. I had not had time to see if this were the best point. I perceived it was a good one, and that the light was just suitable; and if I neglected getting my view then, I could not get the same till next day at the same hour, when I hoped to be far on my journey back to Jerusalem. I exposed five 10 by 8 and ten stereo. plates before sunset, making a hasty dinner at intervals. Had I been working a wet process, the chances were I should not have been able to get a single picture. A friend who accompanied me from Jerusalem, and who worked by the wet process, had just got his apparatus in position and a plate prepared, when he had the mortification of seeing the sun drop below the horizon, which it does in these latitudes in a very precipitate manner, leaving the spectator in nearly total darkness in a moment. The last 10 by 8 plate I exposed was just before sunset, and so dark did it become at once that I required a torch to enable me to undo the fastenings of my camera, and I had a difficulty in finding my way to the tents. This picture will be recognised, by those who have seen the published views, as the one of Hebron, with the Lazaretto in the foreground. I developed one view the same evening in my tent, leaving the others till my return to Jerusalem.

Next day I found on riding round the city that I had got the best point of view for including in my picture of Hebron the Cave of Macpelah, where repose the ashes of Abraham and his wife and sons. This holy place is closed to all but the followers of Mahomet, who guard it so carefully that no Jew or Christian has ever been allowed to approach the grave of the father of the faithful for at least six hundred years. Our knowledge of the place is therefore the most meagre. It is not doubted, however, that the Harem does enclose it. The great Mosque of Omar at Jerusalem has been more or less open to travellers ever since the Crimean war; but this at Hebron has never been accessible. The authorities have not power enough at command, even if they willed it, to admit unbelievers, as we are called. The people, as I have before remarked, are very bigotted Moslems. Some travellers have said they were not permitted to approach it. Our party, under the guidance of the doctor at the Quarantine station, went up to the principal entrance and walked quite round it.

On my way back to Jerusalem I visited the oak which, it is said, is the identical tree under which Abraham pitched his tent. I took a picture of it. A noble tree it is, the last of the once flourishing forest of oaks at Mamre, and if for nothing else than this it deserves its celebrity, linking us as it does with the events of three thousand years ago.

I hurry back to Jerusalem where, for the present, I again rest for a little.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The ordinary meeting for October was held at Myddleton Hall, Islington, on the 23rd ult., at eight o'clock,—George Shadbolt, Esq., Vice-President, in the chair.

After the minutes were read, and a verbal error corrected, they were confirmed.

Mr. W. T. F. M. Ingall and Mr. Thomas Ross were duly elected members of the Association.

The Secretary then read a letter from the Secretary of the Bradford Photographic Society, as follows:—

16, *Kirkgate, Bradford,* 21*st October,* 1861.

John Barnett, Esq.

Dear Sir,—The members of the Bradford Photographic Society are making arrangements for holding an Exhibition in December of this year, which, if successfully managed, will be on a scale not to be surpassed, and most respectfully ask your kind support.

Being the first of this kind in Bradford, it will most undoubtedly excite great interest, especially if we consider the difficulties the country photographer and the scientific connoisseur have of beholding the great perfection to which photography has been carried by our brethren of the great metropolis.

Trusting to have a line from you in return,

I am, dear Sir, yours faithfully,

W. GORDON THOMPSON.

The Chairman said that as a Society it would of course be impossible for the North London Photographic Association to do more than respond by good wishes, but that the object of the Bradford Society would probably be forwarded by bringing the matter before the members of the North London Photographic Association individually, which would be best accomplished by the publication of the letter in the report of the meeting.

Mr. G. Wharton Simpson then read a paper *On Development without Free Nitrate of Silver.* [See page 376.]

The thanks of the meeting were accorded to Mr. Simpson by acclamation.

Mr. Seeley mentioned that, after washing an exposed dry plate prepared by the tannin process, he was surprised to find traces of the picture visible before the application of the developer. He mentioned this as bearing upon the subject of the paper which they had just heard read. He was informed that the phenomenon was by no means an uncommon one in preservative processes. He inquired whether, in using a hot developer, it was needful to be particular about the exact temperature? and, if so, whether any provision were made for maintaining it at a uniform degree of heat? Also, whether any disadvantage attended the use of a hot developer?

Mr. Simpson, in reply, stated that he generally washed his plate with hot water when about to use a hot developer, but did not find any particular temperature of importance; and when the developer got cool, if the picture were not sufficiently developed, he repeated the whole operation. The only disadvantage of using a hot developer he found to be, a slight tendency to a surface deposit, which partially veiled the picture; hence he considered it most applicable to the collodio-albumen process, because the surface deposit could, without detriment, be subsequently rubbed off plates prepared by this process without injury to the negative.

Mr. Moens added that a tendency to cause blisters must also be allowed to be a drawback in the use of a hot developer.

Mr. Seeley remarked that it was generally supposed that the developed picture consisted of metallic silver: how could this be the case if no free nitrate of silver were present to be reduced?

Mr. Moens remarked that it might be reduced from a small quantity of chloride of silver present.

The Chairman said that there was another source whence the picture might be formed, that did not appear to have been taken account of by the several speakers and experimentalists. When Mr. Wardley's plan was first made public he (the chairman) had made a note for comment at a fitting opportunity with reference to this subject. In all the instances in which the development was found capable of being effected without the aid of free nitrate of silver (with the exception of one mentioned by Mr. Simpson in his paper that evening), organic matter in some form or other was present, and it was notorious that nitrate of silver would, in contact with organic matter, give rise to a compound of organic matter and oxide of silver, which was capable of reduction under the action of a developer, consequently there was no difficulty in comprehending how the image would be developed on collodio-albumen, Fothergill, tannin, or Hill Norris's plates, though he (the speaker) was surprised to find that the latter, according to Mr. Simpson, allowed a more ready development than the others, because gelatine, though it would combine with oxide of silver, did so with less facility than albumen would. In the one excepted case, though there was no free nitrate there was, as had been observed by Mr. Moens, chloride of silver, which was capable of reduction by a deoxydising agent. The facility with which Dr. Norris's plates developed rather tended to confirm the conjecture that they were prepared with a previous coating of serum of milk, as had been suggested. The only plan that would afford a rigid test of the accuracy of the theory he had advanced, viz., that the image was formed from the organic com-

pound or the chloride, would be to proceed similarly to the manner in which Mr. Simpson had done in the one excepted experiment, that is, to use a simply iodised collodion, and, instead of using a chloride and water to remove the last traces of the nitrate of silver, to use iodide of potassium for the purpose, subsequently washing and drying the film.

Mr. SIMPSON replied that it would be hazardous to draw the conclusion relative to the preparation of Dr. Norris's plates, as suggested by the Chairman, from the experiment which he (Mr. Simpson) had made, as the Chairman had evidently misapprehended his statement. He had developed an image as described on one of Dr. Norris's plates; but, instead of its being more readily brought out, it was, on the contrary, more tardy in appearing and more feeble when it was brought out than those on the other plates named. He thought, with the Chairman, that a collodion film, charged simply with pure iodide of silver, would not afford an impression, as it was well known that pure iodide of silver was *absolutely insensitive* to light.

The CHAIRMAN knew that it was generally believed to be insensitive to light, but he had demonstrated some years ago that this was an error. He asserted that pure iodide of silver is sensitive to light, but that a visible image could not be obtained without the additton of nitrate of silver prior to or in connexion with the developer.

Mr. SIMPSON said that he had not brought this subject forward for the purpose of establishing any theoretical point, but rather with the practical view of inducing operators to adopt the principle of separating the operations of obtaining details and intensifying. He was convinced that by so doing much finer results might be attained than were generally so at present; and, by pursuing the course he advocated, he believed that the natural clouds might more frequently be obtained with the landscapes even upon dry plates.—He then exhibited several fine pictures taken by Mr. Mudd, of Manchester, illustrative of the principles advocated in the paper, and drew attention to the natural clouds impressed on a collodio-albumen plate. [The pictures, which were very fine specimens of photographic art, were handed round and much admired.]

Mr. SIMPSON mentioned that the idea advocated in his paper had also suggested itself to Mr. Hill, who that evening had mentioned it to him as soon as they had met in the room without Mr. Hill having been aware that he (the speaker) was about to read a paper on the subject. It was one of those singular coincidences of ideas which sometimes occur with those working in the same direction.

Mr. How mentioned that, with reference to the idea of iodide of silver being insensitive to light, he knew that formerly Mr. Bingham used to expose his iodised paper to the sunshine as a part of the regular process of its manufacture, under the idea that it was thereby improved.

The CHAIRMAN did not deny that it might possibly have been improved thereby; but improvement implied that it was *not* insensitive.

Mr. HILL exhibited some pictures, belonging to Mr. Thomas Ross, which had been taken by the panoramic lens.

Mr. MOENS then read a paper, entitled *A Few Notes on Dry-plate Processes, at Home and Abroad.* [See page 382.] He thought it singular that he should be advocating a course of development diametrically opposed to that of Mr. Simpson, and yet with the same object in view—Mr. Simpson beginning without any or a mere trace of silver, while he use. an abundance of silver solution to commence with before applying any developer, and then only a comparatively small quantity till all the details were out.

The CHAIRMAN thought that there was more agreement between them than Mr. Moens supposed. The united force of the silver and developing solutions was the real agent employed, and the surplus of either ingredient merely acted as so much diluting liquid.

Mr. SEELEY mentioned that the Government photographer at the South Kensington Museum differed widely in his practice from both methods that had been before them that evening. When copying paintings, he used equal proportions of nitrate of silver and pyrogallic solutions.

A vote of thanks was given to Mr. Moens for his paper.

Some desultory conversation then followed, relative to the admixture of gum with albumen in dry-plate practice, its action in making the albumen film more easily penetrable by the developer, and producing a more dense deposit; and it was considered as merely a modification of Whipple's process, in which sugar was employed for similar purposes.

Mr. How exhibited some negatives (and proofs upon paper from the same) taken with Matheson's collodion, and developed with iron, without subsequent intensification.

Mr. HUGHES inquired whether there was any novelty in the negatives exhibited?

Mr. How said only in their having required no after intensification.

Mr. HUGHES stated that it was an error to suppose that there was any novelty in such a qualification: it was common to most good preparations of collodion. He then addressed himself to the earlier question that had been raised, and concurred in the recommendation of Mr. Simpson to have two objects in view during development; and this, in his opinion, made the iron developer preferable to pyrogallic acid, because the operator could first turn his attention to bringing out the details without being under any apprehension of some parts of the picture becoming too dense while waiting for the appearance of the more delicate half-tones, and then, when these were fully out, he could intensify the whole as much as he desired. He considered the practice of developing and intensifying at one operation a clue to past troubles; and a satisfactory explanation of the reason why the pictures of the present day were better in regard to delicacy and harmony of tone was to be found in the much more prevalent practice of developing first with iron and subsequently intensifying by the same or some other process. With iron there was no difficulty in using it for both operations. It was owing to this principle that Mr. Mudd obtained such soft pictures by a process which is generally reported to produce excessively hard ones; indeed, the chief merit of the iron developer he regarded to be its capability of separating the two portions of the operation.

Mr. HILL observed that Mr. Heath's practice with the pyrogallic acid developer involved precisely the same principle.

Mr. SIMPSON stated that Mr. Heath had, however, now abandoned the use of pyrogallic acid in favour of a salt of iron.

Mr. REINER said that the advantage of using an iron developer depended much upon the kind of collodion.

Mr. HUGHES: Upon the pyroxyline of which it is made, but not upon the iodising ingredient. The Parisians very rarely use any other than an iron developer.

Mr. HILL stated that he had tried Mr. Dallmeyer's triplet lenses, but found they worked much slower than ordinary single lenses.

The Chairman exhibited some excellent stereographs taken by Mr. Hanson, of Leeds, and pointed out one in particular as pre-eminently artistic. [See page 386.] They were much admired.

Mr. Simpson exhibited a copy of Mr. H. P. Robinson's picture of *The Lady of Shalott*, and Mr. Moens some specimens of a new kind of photographic ware lately introduced by Messrs. Silver and Co., called "ebonite." Though he had only baths and trays, he believed it would be found applicable also for cameras and lens mountings.

Thanks were accorded to the gentlemen who had in various ways contributed to the interest of the meeting. An adjournment then took place to the 20th instant.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THIS Society met at the usual place on the 2nd ult., when Mr. Marwick, the President, occupied the chair.

Mr. Niven, C.A., and Mr. Fleming, manufacturing chemist, were balloted for, and admitted members of the Society.

Mr. DAVIES then read a paper *On Composition as Applied to Photographic Pictures.* [Mr. Davies's paper was illustrated by a number of sketches, which gave force to his observations. These have been placed in our engraver's hands; but we regret to say that it has been found impossible to have them ready for this number of the Journal. We have preferred, therefore, leaving over the whole paper till our next number, rather than destroy the unity of the subject by dividing the article.]

A considerable number of appropriate diagrams, photographs, and other pictures were exhibited by Mr. Davies, who, in the course of his paper, explained and commented on the peculiarities of composition in each.

At the close, Mr. J. T. TAYLOR, in proposing a vote of thanks to Mr. Davies, stated that, so far as he was aware, that was the first time that anything in the shape of lessons in art had been brought before an Edinburgh photographic audience; and even in the photographic world at large the scientific intelligence very largely predominated over the artistic. While the scientific section of photographic societies had contributed of its abundance to the general store, the art section had been slow in following the example, and very chary in imparting its *quid pro quo*. In general, for any art knowledge possessed by the majority of amateurs, or even professionals, they were indebted to their own taste—at least they owed very little to the artist members. It would, however, be unjust not to mention that there were some noble exceptions among the *artist* section of photography, and *apropos* of these he might mention the name of Mr. Wall, of London, whose labours in this direction he had every reason to believe were highly appreciated.

Mr. MARWICK thought that Mr. Taylor was rather severe upon the artists, seeing that every thing they knew about art was derived from them, Even in Mr. Davies's paper, excellent though it was, there was nothing but what could be found in the works of those writers on art quoted by Mr. Davies. Sir Joshua Reynolds certainly never wrote with an eye to photography, seeing he died long before photography had been invented; but all the principles introduced by Mr. Davies might be deduced from his works.

Mr. TAYLOR granted the truth of all Mr. Marwick had said about the principles enunciated in the paper just read being found in the writings alluded to: so might the principles of photographic science be found in various treatises on chemistry; but what he complained of was that these principles were seldom or ever brought before photographic societies such as theirs, in a tangible form, in the same way as the applications of the chemical principles of the art were.

Mr. DAVIES said the complaint of Mr. Taylor as to artists was to some extent met by the quotation in his paper from Sir Joshua Reynolds, which was to the effect that some of the principles were too slight and evanescent to be taught in words—they were rather felt than otherwise—and others were so palpable that all engaged in art should know them; besides there was the fact, as intimated by him, that artists, as a body, were very deficient in realising their ideas in words. Moreover, they had not the privilege of having many of them at their meetings, and those who did attend such meetings perhaps thought the simple principles discussed in the paper too elementary for their teaching, especially as they were to be found in most works on design and composition.

Mr. Nicol said that it was a subject on which he was totally unable to speak. He, however, was very glad when Mr. Davies agreed to bring forward the subject of composition, for with himself a nice picture was a matter of haphazard, for he just shifted about from place to place until he got the point of view that satisfied him; but from the assistance rendered by the paper read that night he would now be able to do it in a few minutes. Many of those who are, as it were, born artists, might not think much of the lesson they had that evening received, but he was satisfied that many present must feel the value of it.

In reply to a question about the value of Sir William Newton's method of producing artistic effect by putting secondary objects slightly out of focus, Mr. Nicol said he usually focussed for the chief objects in the view and allowed the distance to take its chance, as he believed that aërial perspective could only be secured by having the distant objects slightly out of focus.

Mr. Slight was sorry he could not agree with Mr. Nicol. He thought there was nothing to prevent a good picture from possessing absolute sharpness in every part, and at the same time to possess all the necessary aërial perspective by a proper gradation of colour.

Mr. Bow agreed with the last speaker. The diminution in colour was quite apparent if a black object, such as a crow, at a considerable distance, were compared with one's hat held in the hand. The two colours would be entirely different, while the form of the distant object would be perfectly sharp and distinct.

Several other gentlemen made remarks on the subject; and Mr. Davies. at the request of the Society, having intimated that he would resume the subject, in its application to figure-grouping, at an early date, the meeting separated.

The Society again met on the 16th ult.,—Mr. Slight, Vice-preisdent, in the chair.

Mr. Musgrave read a paper *On Positive Printing.* [See page 376.]

After some discussion on the subject, and the awarding of a vote of thanks to Mr. Musgrave, the meeting separated.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The first ordinary monthly meeting of this Society was held at the Religious Institution Rooms, on Thursday, the 3rd ult. Mr. A. Mactear occupied the chair.

After the minutes of the previous meeting had been read and approved of, several members exhibited pictures by different processes.

Mr. John Jex Long, on behalf of Mr. Spencer, exhibited an instantaneous shutter. The action of this shutter was much admired.

The Chairman mentioned his having previously exhibited an apparatus for the same purpose, and which he thought was simpler and would be quite as instantaneous in its action.

Mr. Long expressed a fear that the camera would shake by the action of the shutter he had exhibited; and explained that it was not the invention of Mr. Spencer, but was, he understood, made and invented by a gentleman in Ayrshire, whose name he had forgotten.

Mr. Brown exhibited a negative by the tannin process.

Mr. Robb said he had been trying that process, but found the results inferior to those by the Fothergill process, which he had been working for some time. The tannin he found slower than the Fothergill plates, and much more liable to be stained.

Mr. Mactear inquired if any one had been troubled with radiated markings in Fothergill plates?

Mr. Robb said he had not, or at least not much.

In reply to a question by the Secretary, Mr. Robb said his exposure for Fothergill plates, in good sunlight, with a quarter lens and three-eighths of an inch aperture, would be about three minutes, while the tannin plate, with the same lens and under the same condition of light, would require five minutes.

Mr. John Cramb then exhibited his stereoscopic cameras, which have been already described in this Journal. [See page 265.] Mr. Cramb explained their construction, and showed the manner of using them. He stated that he had been induced to bring them to the meeting in consequence of the attack made on him by Mr. Sidebotham at a meeting of the Manchester Photographic Society, as reported in The British Journal of Photography. [See page 294.]

On the motion of Mr. James Ewing, a vote of thanks was passed to Mr. Cramb for exhibiting and explaining his cameras.

Mr. D. Brown exhibited a photograph of the *Sham Fight.*

The Secretary then brought before the meeting several prints from negatives taken by Mr. Sutton with the panoramic lens, and also a negative on talc by the same lens. The uniform sharpness of the prints was much admired, several members expressing themselves as in the highest degree satisfied with the results shown.

Mr. James Cramb gave a brief outline of the principles involved in the construction of this lens. Referring to the paper read at the recent meeting of the British Association by Mr. Sutton in explanation of the construction of the lens, he said that he had been agreeably surprised to find that he could understand what the writer meant, which was more than he could say of most of the articles on optical subjects in photographic journals. Mr. Cramb concluded by moving the thanks of the Society to Mr. Sutton and Mr. Ross for sending the prints for inspection.

The motion being seconded, was most cordially passed.

The Secretary intimated that Mr. Ross had promised to send a camera and a complete set of apparatus for working the panoramic lens for the next meeting. The Secretary was instructed to write to Mr. Ross, conveying to him the thanks of the meeting for the attention he had shown to the Society, and to request him to send the camera, &c., as promised.

Some conversation then took place on alkaline toning.

Mr. Mactear recommended the members to try the acetate of soda with the gold toning.

The further consideration of the question was postponed till the succeeding meeting, when members were expected to come prepared with facts, opinions, and results by that process of toning.

Foreign Correspondence.

Paris, October 26th, 1861.

A new vehicle for positive pictures on collodion is being talked of at the present moment. It is simply card-board covered with a dark varnish, and rubbed and polished as usual, and then cut up into sheets ready for the various photographic operations. These sheets are thin and flexible, and proof against the acids employed. They receive all the preparations, as glass does. The collodion is spread over them very easily, and thus, by the ordinary processes, are obtained very harmonious, clear, and vigorous pictures. No doubt, if what is announced be correct—and that I cannot affirm, as I have not yet seen any of the results—this invention is good; but its only object is the obtaining of direct positives, and I do not see the advantage of suppressing the negative. If these card-board sheets are so convenient, why not substitute albumen for collodion, and apply them, with or without a white varnish, to the printing of pictures by contact? Then the invention would assume greater importance.

What appears to me worthy of a more hearty welcome is a moveable laboratory which one of our manufacturers has just had constructed. It has neither the proportions or the elegance of the turnouts which some of our opulent amateurs employ for their distant excursions, but, modest-looking as it is, it appears to me ingeniously contrived and sufficient for the purpose intended. It is a sort of box about a yard and a-half long, a yard high, and twenty-seven inches broad, and is placed upon four wheels resembling those used for children's carriages, or for the chairs of invalids. One of the large sides opens in two leaves like a cupboard. In the interior, the whole apparatus is stowed away during the journey; and besides the ordinary utensils there is also a reservoir, with tap, for eighteen *litres* of water. An india-rubber tube carries off the dirty water to the outside. When the photographer wishes to operate, he opens the two leaves, which are furnished above and below with triangular boards, so filling up the corners and fitting in with a rectangular board placed above the operator's head, so as to prevent the light from penetrating. A black curtain is thrown over the whole, and the photographer sits down on his folding chair and manipulates at his ease. Two apertures, fitted with yellow glass, give sufficient light to the interior. When the operation is finished, everything takes its place again in the box, which, with all its contents, is sufficiently light to allow of its being drawn without fatigue. This carriage has the advantage of not being expensive: its price is 300 francs. Several artists have already employed it with success—M. Franck among others.

M. Niépce de Saint Victor will, in a few days, present to the Academy of Sciences a paper *On the Recent Results of his Heliochromic Researches.* Hitherto he had been obliged to heat the plates in order to obtain the coloured mirage. That system had, among other disadvantages, that of producing red grounds, which gave too strong a tint to the whole picture. M. Niépce has succeeded, by employing a particular coating, in dispensing with the action of heat. Further, he has obtained a partial fixation, for his image resists the action of light during twenty-four hours.

M. Edouard Delessert has communicated to me the results of a somewhat curious experiment which he has lately made. After having amplified a portrait to the natural size, he remarked that the face, though thoroughly distinct and free from deformity, yet presented certain exaggerated effects. Thus the hairs of the beard seemed bigger than in nature. I have myself seen the picture in question, and may say that it is one of the finest that have been produced in this style. I was, however, struck, as well as the author, with the exaggeration of certain details. M. Delessert took a *cliché* of normal size from his amplified image and printed therefrom a positive picture: this last has all the delicacy of detail which is seen in a picture taken

from nature, and the beard in particular resumes the appearance that it presents in the original. Does not this experiment prove that certain exaggerations remarked in amplified images are but an optical illusion? Else, how would one part, enlarged beyond measure, resume its right proportions when the whole image is reduced? It seems to me that, if the deformity were real, it would still exist after the second operation.

The same amateur has devised an ingenious means for obviating the inconvenience arising from the power of the enormous condenser attached to his amplifying apparatus. The luminous pencil projected by this lens produces a heat that no *cliché* could resist. At first, M. Delessert employed a ventilator kept in movement by the hand, which brought a constant current of fresh air upon the negative; but, as this system was very inconvenient, it was abandoned for another, which consists in letting the solar rays pass through a sheet of fresh water. The frame containing the *cliché* is a sort of upright glass dish filled with water. One tube serves as a feeder, and another, placed at the upper part, keeps the water at a uniform level.

M. Poitevin is busily occupied in applying to porcelain and enamel his process of printing with powders. He has already obtained interesting results.

Nadar, also, has been repeating his essays in aërian photography. At each new ascension new difficulties present themselves; but yet who would be bold enough to say that success is impossible?

ERNEST LACAN.

New York, October 12th, 1861.

We Americans, three or four thousand miles away from the sources of very much of the modern advancements in science and the arts, no doubt are often tendered the sympathy and condolence of the benevolent cosmopolitans of Europe. It is admitted that our race is of a good stock, and if we only had a chance of mingling in good society, &c., &c., we should become quite respectable, &c., &c.

But sympathy on that account is wasted. Our very distant habitat gives us really great and peculiar advantages. We are beyond the reach of the rivalries, prejudices, and jealousies of the nations and cliques of Europe. We are able to receive and decide upon everything dispassionately. We can prove things by their intrinsic merit. If a European invention be adopted in America it must be a good one.

Also we get our information easily. Our periodicals devoted to science and the arts report everything that is done in Europe. They are the *créme de la créme*. Our *Journal of Photography*, for example, reproduces whatever and all that is useful in any and all the European journals—at least such is the publisher's boast.

But enough of these generalities, and I drop down to a specific subject—bath vessels.

Every kind of bath which has been found useful in Europe has been imported here, and passed upon. We have used your porcelain, white earthenware, and glass. The first and last met the general approval, except in the quality of high price. The white earthenware is about to be utterly condemned for its lack of durability.

We were the first to abandon gutta-percha. We found a fair substitute in vulcanite; but vulcanite has had its day for that purpose. At present, probably, the most popular bath is known as the photographic ware, an invention of George Mathiot, an electrotypist, of Washington. The invention grew out of a want in Mr. Mathiot's business, viz., a cheap ware which will hold acid solutions, and consists simply in soaking the vessels of unglazed and porous porcelain in melted wax. Thus Mr. Mathiot killed two birds with one stone, and did a very handsome thing for photography as well as for electrotypy. Such ware costs but a trifle, is neat, handy, and durable. Would not paraffin be a useful substitute for the wax? There is no compound known which is so little affected by corrosive matters.

Our largest-sized baths are a combination of glass, rubber, iron, and wood—plate-glass sides, rubber joints, all held snug and round by screws and wood. Also we make baths of blown glass, in one piece; but they are too wide. An elegant glass bath, such as I have seen from England, appears to be beyond the capacity of our artisans—at least, so I infer from the fact that they have attempted it without success. They have, however, succeeded very well in making baths of blown glass.

I have just had the pleasure of examining a splendid gold medal, presented by the Prince of Wales to Messrs. Gurney and Son, as a testimonial for photographs of the Prince and his suite. Mr. Gurney has already received more than a dozen prizes, in medals, plate, &c. (one of them cost £500); but he sets the highest value on the Prince's handsome token.

CHARLES A. SEELY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

IS PHOTOGRAPHY A FINE ART?*

à Monsieur Silvy.

"Honos alit artes."

Sir,—You have addressed to me a letter in the *Photographic Journal* in answer to one I had written to its Editor on the exciting question—Is Photography a Fine Art?

The reason for addressing yourself to me personally seems to have been that I had used the expression of a *single unhappy exception* in referring to your secession from the brotherhood of photography, united (at least in England) in the same feeling of resentment for the injustice offered to our art in the classification of the Great Exhibition of 1862.

But whatever has been your reason, and notwithstanding a few sarcastic allusions, as you have written in a gentlemanly tone and spirit, I consider myself in politeness bound to address you a short reply through the same channel.

I have read your letter with the greatest curiosity and attention, expecting to find in it some very tortuous arguments (such as those generally employed in the defence of a bad cause) to show the inability of photography to figure among the fine arts. But what has been my joy on finding that, being yourself an artist of talent, a man of knowledge, intellect, and education, you could not help, in discussing the question, unravelling all the claims of photography, and proving, *malgré vous*, that it is really a marvellous and beautiful art, dependent on the exercise of the most refined mental faculties—consequently distinct from a purely mechanical art.

From all your reasonings it is clear that photography is something more dignified than a mere mechanical art. Here are your own words:—"*I also assert that photography is worthy of occupying in art an elevated rank; I also assert that this art requires not only mechanical aid (which is the fundamental basis), but also thought, taste, judgment, and tact.*" You add:—"*Irrespective of the excellence of the machine and accessories, the artist who practises it must, to merit that name, prove his talent, ability, taste, and sentiment.*"

That is enough: I am perfectly satisfied with your definition and with such an eulogy of photography. After having said so much, how would it be possible to pretend that the art worthy of occuping an elevated rank—that the art requiring not only mechanical aid, but also thought, taste, judgment, and tact—is not a fine art?

You say that there is one quality which "*I have not cited, because, in fact, it is not indispensable to photography: that is to say, 'Genius'—the genius which invents, creates, composes, and which imprints on its works the immortal seal of fine arts—fine among all arts.*"

In my letter I have stated two or three times that genius was one of the qualities required; but wherever I may not have cited precisely the word *genius*, I have cited what it means. I say that genius is as much indispensable to photography as to any other of the fine arts. What is genius? Johnson's Dictionary will tell us. We find in it—"*Genius: mental power or faculties—disposition of nature by which one is qualified for some peculiar employment.*"

Therefore, according to Johnson, the photographer who has a certain amount of mental power or faculties—a disposition of nature by which he is qualified for the peculiar employment of his art—that photographer has the quality of genius of which you make exception. If genius is what Johnson explains, will you say that genius—mental power or faculties—natural disposition—are not indispensable to the photographer who, according to your own admission, can merit the name of artist for his talent, ability, taste, and sentiment?

In photography there is ample room for that genius you speak of. Photography indeed can invent, create, and compose as well as copy. In fact, particularly in portraiture, the machine copies what the true artist has invented, created, and composed, which could never have been copied or represented if the photographer had not possessed genius.

As for the genius which imprints on its works the immortal seal of fine arts, I would consider myself guilty of the most bombastic exaggeration if I had claimed for photography the performance of such a sublime deed.

The works of photography may be works of fine arts without bearing *the immortal seal*, which, I need not assure you, is fixed on a very limited number of works of painting, sculpture, and poetry; for many, many pictures, statues, and poems may be really works of fine arts, without fully deserving the honour of immortality.

When I claim for photography a place in the fine arts, I cannot help always remembering that engraving and dancing have been admitted in the temple; and no one is disposed to cavil on their account. But would it not sound rather strange to hear one speaking of the genius which in engraving and dancing imprints on their works the immortal seal of fine arts—fine among all arts!

You are aware, Sir, I suppose, that photography has been admitted several times already in public Exhibitions of fine arts.

* From the *Journal of the Photographic Society.*

I can name three very important occasions when photography has received that honour:—one at the Fine Arts Exhibition at Manchester, and the other at the Exposition des Beaux Arts of Paris, in 1861, as well as in Munich.

In the first, exclusively devoted to the fine arts, photography was invited under no ungracious denomination, and the Commissioners admitted its productions with the most remarkable and celebrated works of the great masters in the fine arts, to do honour to one of the most beautiful discoveries of our age.

In the second, photography alone was admitted under the same roof where the recent works of painting, sculpture, and engraving were exhibited; and, although forming a separate department, still photography was considered worthy of being connected with the usual Exhibition of Fine Arts in Paris.

It would have been in good taste for the Great Exhibition of 1862, following these generous precedents, to have given to photography an honourable place in the classification. This would have offended no one, and would have been a cause of gratification to all those to whom the art of photography is dear. To make room for photography in the department of the fine arts was only to raise every other art one step higher.

It has been decided differently. But if the Great Exhibition has not been very gracious to one of the most extraordinary and splendid discoveries of the time, it remains to us, the enthusiastic adepts of photography, to do honour ourselves to our art: we shall not fail in our efforts. You, Sir, have already begun to fulfil your part, both by the artistical feeling of your own works, and by your praises and definition of the qualities required for the practice of photography.

Between us there is only a vague and empty discussion of words. The point is gained: you have proved that photography is a beautiful, a marvellous art, and *I think* I have proved that it is a fine art. But if I have failed, I shall never regret or be ashamed of having been among the first defenders of the honour of our art; and if, in the history of photography, my name is recorded, I am convinced, at least I hope, that it will not be in words of blame for my having endeavoured to have photography called a *fine art*, I have the honour to be, Sir,

107, *Regent Street*, Your obedient Servant,
Oct. 2, 1861. A. CLAUDET.

DEVELOPMENT.

To the EDITOR.

SIR,—In answer to your correspondent, "R. G.," the acid silver solution is not required for the wet process, except in those cases where the developer needs the addition of silver after the details are out to produce sufficient intensity, when its use gives far better results than that of plain nitrate solution. For this purpose one grain to one and a-half grains of citric acid to each grain of nitrate will be sufficient. The use of the alcoholic solution of pyrogallic saves the trouble of weighing out: when diluted for use in the *wet* process the proper amount of acid must be added. I am, yours, &c., C. RUSSELL.

October 21, 1861.

THE APPLICATION OF METEOROLOGY TO PHOTOGRAPHY.

To the EDITOR.

SIR,—I beg to suggest, through your excellent Journal, the application of photography to meteorology. The magnesian light illuminating the indices of a set of meteorological instruments will enable the state of those indices to be photographed periodically or continuously upon a sensitised surface, travelling by clockwork, at the back of a camera.

The *indices* of a complete set of meteorological instruments could be easily arranged so as to be *all* within a limited space, illuminated by the magnesian light, and that space the focus of the camera.

Considering that the space to be illuminated would be small, and that the magnesian light can be supplied continuously, and concentrated by means of lens and reflector, the cost of illumination would not be very great, while the gain to the science of meteorology, by dispensing with human supervision while obtaining a *constant report*, would be the greatest, in my humble opinion, which it has yet obtained.

If we are *ever* to discover the laws that regulate the weather, the infallible photo-meteorological chart, from stations distributed throughout the country, or throughout the world, would be of the highest service.

Is the plan a practicable one?—I am, yours, &c.. TWIPSHAM.

Rothesay, October 11th, 1861.

[Our correspondent does not appear to be aware that continuous photographic records of magnetic disturbances have been taken for many years past at the Greenwich Observatory, by a much less costly mode of illumination—that of a small lamp—at the instigation of Mr. Brooke. We believe, but are not quite sure, that a similar plan is in use for the barometer and thermometer: at any rate, the plan was suggested in this Journal long since, by Mr. C. J. Burnett, of having an opening behind the tubes of the thermometer and barometer, with sensitive paper traversing the same, at a regulated speed. The columns of mercury would, in both cases, determine the length of the slit exposed, which would vary according to temperature and pressure of the atmosphere respectively. Both of these instruments could very well be worked by aid of any ordinary gas jet or lamp.—ED.]

TANNIN PLATES.

To the EDITOR.

SIR,—What is your opinion of the way in which tannin acts on the washed collodion plate? Is there any chemical change produced? or is it by merely acting as a film, to *protect* the collodion? Does it produce a film like gelatine or isinglass? I have latterly used it *hot*, with the best possible results, both as to keeping properties, intensity, and prevention of film slipping off during development. The solution of ordinary strength, filtered, is merely *boiled* over a spirit lamp in the dark-room (screened to prevent any white light), and in that state poured over the washed plate, and allowed to stand for three minutes, and then drained off, and put by to dry in a dark box. It appears to *permeate* the pores, as in Hill Norris's gelatine process. I wish some of your readers would try it, and report.—I am, yours, &c., M. D.

Dublin, October 26th, 1861.

P.S.—If you examine Hill Norris's plates, a *film* of *varnish* is evident, which is *seen* on the *back* of the plate when it has *escaped* by *drainage* or other causes.

[No doubt the tannin acts in some measure in the same manner as the gelatine, in affording ready penetration of the film to aqueous solutions; but, in addition thereto, it acts as a great intensifier of the image, probably from its reducing property. Applying the solution hot, we can well suppose to be advantageous. We fancy that the film of *varnish* which you have imagined on Dr. Hill Norris's plates is only some of the *gelatine solution* which has accidentally run over the back.—ED.]

INSENSITIVENESS.

To the EDITOR.

SIR,—I have been much surprised at the extraordinary time required for photographing woody scenery. Having taken a considerable number of Fothergill's dry plates and a pair of ————'s landscape lenses to the Quantock Hills, where I was residing for a short time, I found, greatly to my disappointment, that one hour and a-half was barely sufficient to bring out anything like detail among the branches (the foliage was quite hopeless), at noonday, with the sun shining full on them: even with such an exposure the developing took three-quarters of an hour at the very least. Will you kindly inform me where the fault probably lies?

I can only add that I have taken *town* views with the same plates and with one of Ross's lenses in thirty-five seconds.

———— having been strongly recommended to me for his lenses, makes me hesitate in throwing the blame on him.

I am, yours, &c., MARTIN HENRY PAYNE.

Sheffield, Oct. 17, 1861.

[Foliage requires very much more exposure than architectural subjects do in order to produce an impression, and the different lenses may make some difference in the time; but with every allowance for both of these drawbacks, there cannot be anything like such retardation as you mention without further disturbing causes. Perhaps your exciting-bath was too acid with free nitric acid, or your developer may have had an over-dose of citric acid. We presume that, in both cases, you allude to landscape lenses and with corresponding apertures.—ED.]

PRESERVATIVE PLATE-BOXES.

To the EDITOR.

SIR,—In your last impression appears a letter from Mr. D. Hornby, relating the disappointment occasioned by the use of zinc boxes, with grooves of the same metal, for carrying his sensitised plates during a tour in Normandy, nearly all becoming covered, on development, with black specks, comets, &c., produced by the friction of the sharp edges of the glass against the metal grooves cutting off particles of the latter, and he remarks:—"I am sorry to have to make this charge against the boxes, as they are so very portable. I hope Mr. Keene's zinc (tinned-iron) boxes, with *gutta-percha grooves*, will be free from this evil. I think that even these will not be perfect, unless the top and bottom be also covered with gutta-percha," &c.

Permit me, in reference to the above allusion to my preservative plate boxes, to explain that, in the construction of them, I have provided for the *perfect isolation* of the prepared plates, gutta percha not only being used for the grooves, but strips of the same placed across the top and bottom, so that contact with the metal is impossible, and I have great confidence that they fully meet the requirements of the dry-plate photographer.

I have used one of them to carry prepared plates to Hastings and back, before developing, without deterioration. Prints from two or three of the negatives I enclose—not for their excellence, but to show the plates had not been injured; also one from a plate kept nine weeks prior to exposure. The plates were all prepared by my measured quantity of water plan; but in some instances they were well flushed with *hot water*, instead of cold, as recommended by Mr. Parry, after the application of the prepared albumen, which appears to possess the following advantages:—Economy of time in washing, *quick* and even drying of the film, less liability to mischief from the use of imperfectly strained albumen, and a film approaching in firmness the collodio-albumen process.

I take this opportunity to bear testimony to the excellence of india-

rubber paste for mounting purposes, the advantages of which, I think, you first drew attention to. I find it easily and quickly used, has no tendency to induce cockling of the print, and, if any get on the mount or front of the print, unlike other substances, as soon as it becomes a little set it is readily rubbed off without leaving a mark.

I am, yours, &c., ALFRED KEENE.

Leamington, Oct. 19, 1861.

[It will be perceived, by reference to a second letter from Mr. Hornby in the present number, that there is no longer any mystery touching the cause of his disasters. We may, however, remark that we do not think it *necessary* where the boxes are made of tinned iron (not of zinc) to have such perfect isolation as Mr. Keene ensures, though, of course, there can be no objection to it. The specimens received evince perfect freedom from spots of any kind. With regard to the use of india-rubber solution for mounting we know of but one objection thereto—but that is a serious one—the very unpleasant scent, which it appears impossible to get entirely rid of: this is due chiefly to the solvent turpentine, but benzole or bisulphide of carbon would be as bad, if not worse, and chloroform is far too expensive.—Ed.]

DRY COLLODION.

To the EDITOR.

SIR,—I am happy to be able to endorse the statements in Mr. Corey's letter in your last number. I have for a long time been accustomed to albumenise my plates before collodionising, even in the wet process. Using a collodion which is apt to leave the plate, and frequently, when in the field, deferring the fixing of my wet negatives until I get home, I have sometimes lost or injured some of my best pictures. This induced me to try albumen, and I have always used it since, as it enables me to wash and even soak the plates without the slightest chance of loosening the film. Instead of ammonia, however, I use the same proportion of acetic acid. The resulting solution is very liquid, easily filtered, and may be floated over the plate like collodion. Some kinds of glass, however, seem to have a repellant property, in which case I use a glass rod to distribute the albumen.

The results of my experiments with resin are all that can possibly be wished. Both in negatives and transparent positives the pictures are exquisitely clean and beautiful, with an amount of detail which is absolutely microscopic, combined with the richest and softer effects of light and shade.

I have, however, very strong doubts about the *rationale* of the process. I do not see why or how resin can *preserve* a dry plate: neither do I believe that it alters the structure of the collodion. Accident has led me to what promises to be a curious conclusion. I strongly suspect that *no preservative is required at all.* I have just developed a plate (a transparent positive), prepared with ordinary old collodion (Keene's), washed and dried, and the result is a perfect picture! I am not desirous of expressing an opinion hastily, and shall, therefore, carry on more experiments during the interval until the next meeting of the North London Photographic Association, and report the result. Should it be as I expect, I, for one, have been experimenting in a wrong direction with a vengeance.

London, Oct. 16, 1861. I am, yours, &c., W. HISLOP.

[It is more than five years back since Dr. Hill Norris announced the fact that sensitised collodion, simply washed and dried, is nearly as sensitive to the actinic impulse as wet collodion—the difficulty consisting in the development, the collodion simply dried being very impenetrable. It was to remedy this defect that Dr. Norris adopted the addition of gelatine, by which the film is kept permeable by aqueous solutions.

If we mistake not, Mr. Samuel Fry is also aware that no preservative solution is needed to retain the sensitiveness.

In addition to the impermeability of a simply dried film, the liability to quit the plate is an annoyance that cannot be put up with; but if the glass be previously coated with albumen, the condition is that of a Fothergill plate. We have long since announced the fact, that not only can a picture be taken on such a film, but that the collodion itself may be subsequently removed without obliterating the picture.—Ed.]

ZINC PLATE-BOXES.

To the EDITOR.

SIR,—I have to-day cleaned out my plate-boxes, and find in all such a mass of dust as fully accounts for the failures I had to complain of in my last. The principal part of this is *powdered shellac*, mixed, however, with *glass* and *metal*. In some parts of the boxes, especially between the grooves, the metal is quite bare, the varnish having been entirely rubbed off.

I have just received a note from a person working a different process to mine, and he has sent me a specimen in which the spots are *precisely* the same as those with which I have been annoyed. He now blames his zinc boxes.

Can you suggest a varnish that will adhere permanently? If not, I think the boxes are much better unvarnished.

I either mentioned the shellac in my last, or intended so to do, as I was then aware that it formed a large proportion of the dust. The boxes were quite clean when the plates were put in.

It is desirable that this question should be set at rest, as faults are, no doubt, often attributed to the process which are due entirely to extraneous causes. I am, yours, &c., D. HORNBY.

Driffield, October 17*th*, 1861.

P.S.—I purchased boxes at three different houses: all have given offence.

[We have already expressed our preference for boxes of tinned iron. Possibly a coating of japanner's gold-size, applied and dried by heat, will answer your purpose: this material is always very slightly "tacky," and would tend rather to retain particles of dust than to let them fall on the plate.—Ed.]

ANSWERS TO CORRESPONDENTS.

*** Several articles in type—among them Mr. Martin's *Notes on Photographic Chemicals*—are left over till our next, for want of room.

B. MARC.—Received.

TRI-BASIC.—See our Paris correspondent's letter in the last number.

LOTUS.—Insoluble in alcohol; but soluble in water, and in acetic acid.

AN OLD ADMIRER.—We have no hope of his returning to photographic pursuits.

F. R.—Personally we prefer the warm tones produced by the size in the English paper.

BEATUS EST.—Then why undeceive him? You know the old adage—"Where ignorance" &c.

F. ORRIDGE.—We are obliged for your proffered courtesy: should we have occasion, we may profit by it.

M. R. JONES.—Honestly we cannot commend your performance, and therefore remain discreetly silent theron.

Q. IN THE CORNER.—It is not likely that we should divulge the name of a correspondent who writes under a *nom de plume*.]

FAN-QUIO. — Messrs. Negretti and Zambra, of Hatton Garden and Regent Street, published some stereographs of Canton, about two years ago.

CAPEL COURT suggests that a photographic gallery of defaulters on the Stock Exchange shall be kept by the Committee. Query: How compel them to sit?

R. J. B.—You have only to consult the back numbers, in which you will find descriptions of nearly every kind of tent that has been introduced for photographic purposes.

C. THOMSON.—A small lens can produce a large picture; but not so well as a larger one, nor so large either—as the curvature of field comes sooner into play in the former.

J. RATHWAY.—See reply to T. G. Perry for replies to your two first questions. 3. Fix with hyposulphite of soda. 4. It is not absolutely necessary to coat the plate previously with gelatine.

T. O.—With a little more practice you will no doubt become a very good photographer. Your manipulation is clean, but your negative is not quite dense enough to afford a vigorous print: it is insufficiently developed, and, we may add, broken in two places during carriage.

T. G. PERRY.—1. A twin lens camera, by all means.—2. You can prepare the plates the night previously without additional washing: exposure should be about double the usual wet process.—3. Either collodion, but, if it should fog the picture, add to the collodion just enough tincture of iodine to colour it lightly.

SAMUEL K.—You had better have a rigid camera made to your lens, and with a sheet of ground-glass to fit *against* a fillet, which you can remove and replace by your dry plates, from the plate-box suspended by hooks to the base of the cameras, in the same way that Professor Maskelyne managed for calotype paper some years ago. Another excellent hint might be taken from him: he employed, for his tripod, some long bamboo canes.

AMATEUR.—Grubb's aplanatic *is* a single combination view lens, and differs from that of the ordinary construction only at the contact surfaces of the flint and crown lenses, the outer curves being nearly identical in both kinds of combinations. In Grubb's lens the "flint" is a convexo-concave, cemented to a "crown" meniscus. In ordinary view lenses the "flint" is a double concave, cemented to a double convex of crown glass. The arrangement of the aplanatic is intended, amongst other qualifications, to admit of the use of a larger aperture, under certain conditions, than can be employed with an ordinary view lens. You have correctly understood us.

HUMPHREY'S JOURNAL.—The editor is quite welcome to copy from our columns, which he does pretty freely at all times; but of late he has omitted the acknowledgment more and more frequently. We therefore beg to remind him that in his journal for the 1st October there are *three* pages of matter by James Martin, and *two* by A. H. Wall; both articles written exclusively for this Journal, but copied without the usual courtesy, besides *two* pages more, *verbatim et literatim*, of our translation from *La Lumiere*, respecting which we do not expect any notice, and about a page and a-half which he does acknowledge—that is, he copies *seven pages and a-half* from us, and generously credits us with *one and a-half*. We presume that he is a modest American.

R. T. D.—We have been necessarily a little tardy in criticising your specimens. There is a general fault of under-exposure throughout, excepting, perhaps, one of the *Doorway into the Chapel at Holyrood*; and, oddly enough, in this one there has been no sunshine at the time of exposure: it is, however, a little foggy. The three best are—*Brooklin Falls, Wallace's Cave, and Philiphaugh Battle-field*; but the last-named is spoilt by the very inartistic arrangement of the figures. The same objection applies to the two of *Roslyn Chapel*, and two of the *Drinking Fountain at Holyrood*: in the third the figures are better arranged, because they are accidentally placed. When you *place* figures, do so with some object: let them be actually engaged in doing something *except* staring at the camera. There are defects in all the negatives of the *Drinking Fountains, Glenfinlan*, and *St. Michael's Bridge*, which render them useless. *Dumblane Cathedral* is out of focus. *Melrose* and *Roslyn* are much under-exposed, but otherwise good—figures excepted. You have a long journey yet before you to reach the standard you have proposed for emulation, but you have done enough to convince us that you will surely "reap in due time, if you faint not."

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 154, Vol. VIII.—NOVEMBER 15, 1861.

The British Journal Photographic Almanac for 1861 having been received with an amount of approval exceeding our most sanguine expectations, it is the intention of the Proprietor and Publisher of this Journal to issue a corresponding one for the year 1862, which, like its predecessor, will be adapted for carrying in the pocket-book. It will contain memoranda of the days of meeting of all the Photographic Societies in the kingdom, together with numerous useful photographic formulæ and processes, tables of equivalents, and in short, various particulars of information of special use to photographers. A copy of the Almanac will be presented with every copy of this Journal issued on the 1st of January next, and it will be on sale to non-subscribers at the price of threepence per copy.

To avoid interfering with the portability of the Almanac, the space devoted to advertisements will of necessity be limited. We are therefore requested by the Publisher to intimate to those wishing to take advantage of so desirable a medium for permanently advertising, that early application for space will be requisite, in order to avoid disappointments and ensure insertion.

Alleged Microscopical Discoveries.—The "Special Correspondent" of a contemporary recently wrote as follows:—"Professor Gerlach, of the University of Erlangen, has obtained some photographs of microscopic objects by a new method, which consists in taking the object itself as the negative image, and then taking a magnified positive of this image, and repeating the operation, alternately positive and negative, until an image is obtained of such a size as to present details of structure far exceeding in magnitude those obtainable by the most powerful microscopes at present in use."—!

The preceding paragraph had previously attracted our attention in the pages of a foreign contemporary (we believe *Cosmos*), and more recently we have noticed that the London correspondent of *Le Moniteur de la Photographie* repeated the same story, quoting from the English journal before alluded to.

We were much amused at the preceding statement at the time of its first appearance, as who would not have been who knew anything of microscopical science? We have, however, received more inquiries than one for information about this marvellous proceeding, though we certainly thought that such a veritable *canard* could not have passed muster with the most credulous. As we have been mistaken in supposing that such a transparent absurdity would have proved its own refutation, we have deemed it advisable to make a few comments on the subject at once, in order to save any of our readers from the disappointment that must certainly ensue from attempts to attain these fancied wonderful results; for we do not hesitate to affirm that by any such means as those described it is *impossible* to produce "details of structure far exceeding in magnitude those obtainable by the most powerful microscopes at present in use," and further, that only those entirely unacquainted with microscopical matters could have written or given currency to such an assertion.

Some of the most excellent photographic illustrations of microscopical objects that have ever yet been executed are the productions of Mr. Wenham, Mr. Kingsley, and M. Bertsch; but, fine as they are, those who are familiar with the objects represented cannot but admit that they fall very far short of the objects themselves when viewed in the microscope. This cannot fail to be the case, for how is it possible that a surface of so comparatively coarse a nature as that formed by the agglomeration of particles of iodide of silver can receive an impression from the details of an image so exquisitely delicate as to require the most careful management of illumination in order that they shall make an impression on the optic nerve? But when we remember that many of the visible details are much finer than the particles of the iodide of silver themselves on which they are supposed to be impressed, and that the operation of enlargement from the collodion film is directed to be performed *several times*, even if the impression of minute details were on the original film, by the time that it had been repeatedly enlarged the final result would of necessity be very like the effect of a fine line engraving upon an alligator's back!

Even the use of a very powerful eye-piece upon the visible image formed by the objective is sufficient to degrade the brilliancy of the finer details, and in some cases to obliterate them altogether; but such a method of amplification is infinitely less destructive than the successive enlargements above proposed.

There is some obscurity in the wording of the paragraph relative to "*taking the object itself as the negative image.*" It may mean that the object is to be viewed by transparence; if so this is only the usual way of viewing all microscopical objects that will bear such treatment. Or it may mean that the object used as a negative is to be brought into direct contact with the sensitive film; but in either case the assertion is equally preposterous.

It may be objected by some that in photographs you occasionally can perceive details that the eye cannot detect in the real objects; but this fact is easily explained. The camera lens, enabling the object to be viewed under a much larger angle of aperture than the unassisted eye can bring to bear upon it, acts to some extent as a telescopic object-glass, and enables the eye *in effect* to approach much nearer to the object than the spot whence the picture is taken; but there are no details in the negative that are not also equally apparent in the image on the focussing-screen, and many that are capable of being detected in the latter do not appear at all in the former—hence no amount of enlargement of such a negative can present details not apparent in the first visible image. What happens with the camera occurs to a far greater extent with the microscope, as there is no comparison between the perfection of the respective objectives employed, and as a consequence, also, of the respective images formed thereby.

Such statements as the one we have noticed are very injurious to the progress of our art. With the uninformed they give rise to most unreasonable expectations; and, when their falsity is discovered, by a natural reaction an undeserved amount of odium attaches to all the declarations of photographers in connexion with the more extraordinary facts revealed by the pursuit of our fascinating occupation.

Since writing the preceding we have received a copy of *La Revue Photographique*, in which allusion is made to the same circumstance as is mentioned at the commencement of this article, but with a slight variation that clears up the mystery about "taking the object itself as the negative image." It appears that the phrase should have run thus:—"Which consists in taking *from* the object itself a negative image, and then in taking from this enlarged image a new positive image," and so on. We may well ask where is the novelty? This mode of proceeding had been adopted by several photo-micrographists years ago, but without any idea of obtaining such marvellous results as are ascribed to Professor Gerlach's productions, simple amplification having been the end in view: the operators, instead of expecting to reveal further details having been quite content if they lost none existing in the original negative.

Of a very different character to that just noticed is the article by Professor Rood which appeared in our last issue; and, as the subject is one of much interest, we shall in our next most probably have some comments thereon.

INTERNATIONAL EXHIBITION.—A Committee of Management for the photographic department has been appointed by the Royal Commissioners, including, amongst other good names, that of Mr. P. Le Nève Foster, as Secretary. We have for several months past been aware that the last-named gentleman was destined to fill the post indicated, but the official announcement has only just taken place. Mr. Foster is a member of the Council of the Photographic Society, and Secretary to the Society of Arts.

QUARTZ LENSES.—In our last we gave details of experiments and results obtained by Mr. Edwin Emerson, of Troy University, New York, relative to the comparative merits of lenses of glass or quartz, and of a simple pin-hole for producing an optical image for photographic purposes. The conclusions at which Mr. Emerson arrived will be found at page 382; but, inasmuch, as we find an obscurity in one and an error in another, arising from a slight omission in manipulation, we deem it advisable to make a few remarks on the subject.

How the use of a pin-hole instead of a lens can have ever been recommended is to us very surprising. The advantages of unlimited focus and absolute freedom from distorting powers appear to us dearly purchased at the expense of rapidity of action and, still worse, of definition. On this point, therefore, we agree with Mr. Emerson; but when he condemns the quartz lens in comparison with a common glass lens as being, though quicker in action, not equal in defining power, we cannot help thinking that he has omitted to make the correction for variation of visual and actinic foci in the latter though possibly not so in the former case. By using a high magnifying power to focus with in the manner described, the more perfect the visible image the more certainly would it throw out the actinic rays from perfect focus. Now, although the dispersive power of quartz is small, it is quite perceptible; and it is not improbable—nothing being said upon the subject in Mr. Emerson's article—that an actinic correction was made for the common glass lens, and omitted with the quartz. In the experiments with the double lens such allowance is, as a matter of course, rendered needless by the optician.

If our conjecture be correct it will quite account for the inferior performance of the quartz lens.

The obscure proposition to which we previously made allusion is that in which it is stated that a quartz lens is very *slightly* quicker in action than that of a double combination achromatic lens, though it is before mentioned that the quartz lens is quicker in action "than a common glass lens of the same aperture, focus, and thickness"—as if the double lens, and achromatic to boot, were quicker than the single lens, when there would have been four times the number of surfaces in one case than in the other to cause loss of light. We are convinced that there is some mistake in this assertion.

A FEW HINTS ON COMPOSITION AS APPLIED TO PHOTOGRAPHIC PICTURES.

By W. H. DAVIES.

[Read at a Meeting of the Edinburgh Photographic Society, on Wednesday, Oct. 2, 1861.]

"The value and rank of every art is in proportion to the mental labour employed in it, or the mental pleasure produced by it."—*Sir Joshua Reynolds.*

ONE would naturally have thought that in a Society like ours this would have been one of the last subjects needing elucidation. Our position as photographers, amateurs or otherwise, necessitates a certain knowledge of it; and I would deprecate much the idea that I am here to-night to teach anything that you do not know, or indeed to do other than simply state a few of my own ideas on the subject, which again may evolve, by being stated, the opinions of those who are better acquainted with it, and so in that way we may all come to be benefitted.

I do not think there is any recondite knowledge needed to appreciate a good picture, any more than there is to appreciate other good and kindred things—such as music, literature, or architecture; but it is one matter to like a thing, and another to be able to say and show why it is good, and to give reasons for the preference. Thus we may know, whether we like it or not, that the first condition in the composition of a figure picture—be it *genre*, historical, photographic, or painted—is whether the point aimed at—the story in short—has been well told; whether the artist has taken advantage of every slight accessory to heighten the interest or tell the tale in its different stages, if that be possible, or to culminate the interest to its principal points. Perhaps the best examples of this may be found in our own Hogarth's works, which are, on the whole, perhaps the most perfect models of how pictorially to carry out the main idea of a story into the most minute details of the picture. Many others might be named, both living and dead, who have chosen this and simpler modes, but one illustration is enough.

Another of the requisites of good composition is to be found in the harmonious arrangement of the lines of the picture: we know that a curve is more pleasing than a straight line, and that some forms—as that of a circle for instance—are more graceful than that of a pyramid, which again is better pictorially than a square, and so on.

Many of us, I have no doubt, have been often shocked and almost ashamed of the hideous abortions we often see perpetrated by some who call themselves photographers, especially in groups of portraits. Thus we have straight regimental lines of faces—say father and mother in the centre, with a child on each side, as nearly of a similar size as possible, and behind, perhaps, a couple of older children looking over the parents' shoulders, each with the inevitable photographic paw resting thereon, and all the rest of it, *ad nauseum*. Are they not to be seen at the corner of every street? or placed on the mantel-shelf of every second parlour you enter?

The last of the requisites of good composition I need mention here is, that the arrangement or subject must be well lighted, in order that we may have a properly balanced effect of light and shade; and this is the more important, seeing that *we* are precluded from the use of colour. Thus, if we are desirous of representing a picture in sunlight let us not fall into the error of having the shadows too deep and wanting in detail, or the whole subject not sufficiently light, as was the case with a celebrated photographic effect of *Sunlight and Breaking Waves*, which the uninitiated public would persist in calling a moonlight scene. Were it not that "comparisons are odious" I could point out and contrast many of the photographic pictures in our last Exhibition; but, as *living* artists are rather touchy, and our art has not lived sufficiently long to allow of a good crop of old masters, I will refrain, although much against my will, as I believe we might learn much that would be to our advantage artistically.

These are, shortly stated, the principal points to be observed in figure compositions. But, as our worthy Secretary phrased it, I am expected to show how *artistic landscape pictures may be made.* You will admit that, before going into that description of manufacture, it will be needful to preface a little, so that I may not plunge you into the middle of how to do the "undoable."

There is among those who assume the position of connoisseurs, *dilettante*, &c., a vast amount of what must be classed as art-cant, as opposed to art-knowledge. It is true if we look only at the artificial and conventional schools of painting, and compare and judge them only with and among themselves, and hear our friends

above-noted prate in their usual style on the matter, we may be lost among the numerous technical and invented terms and apparent profundity of knowledge which they display; but, while comparing one painter with another, and one school with another, how seldom it is that we find the comparison made with the great fountain of imitative art, Dame Nature herself! There is not—nor can there be—any other standard; and the more nearly we approximate to that great silent teacher, and the more perfect our representations of her beauties are, the nearer shall we be to truth and perfection, whatever the school of art-critics may say to the contrary.

It is also true that, to appreciate the good qualities of a fine picture, we require a certain education of the eye, as I before remarked, and that a cultivated eye will be pained by a bad arrangement of form or colour, precisely as a musician is shocked by the discords of an ill-arranged orchestra. But if the pain is bad, the sense of pleasure is exquisite; and those who culpably neglect opportunities of teaching their eyes to see are truly punishing themselves. The glorious forms and tints of the clouds and sky are to them a sealed book: the ever-changing play of light on the tossing waves—the matchless variety of their forms—the deep impressive harmonies of the forest—the grand contours of the mountains, with their peaked summits piercing the clouds—the sweetly swelling lines of the pastoral country—the bubbling of the brook through the tangled brake, or the headlong rush of the mountain torrent—are, to the uneducated eye and dull mind, a dead language. To quote from Wordsworth:—

> "The primrose by the river's brim,
> A yellow primrose is to him,
> And nothing more."

Bearing these facts in mind, nothing seems more wonderful in the whole progress of *our* beautiful art than the very slight attention which has been given by many, very many, of its followers to the subject of what it is that makes a good picture. Whether it is that they are enamoured by the facile production of a successful negative—be it of an imposing series of chimney-pots and roofs as seen from the *studio* window—or of any of the numberless subjects we operate on; or whether it is that our pictures with their simple and often true representations of form satisfies the slight æsthetic desires of most of our friends, without tempting them further; or whether it may be that the education of the eye is but commencing, we will not now stop to inquire; but, if proof were needed for the statement, we have only to adopt the motto on Sir Christopher Wren's tomb and "*Circumspice*," to see that there are by far a much greater number of badly arranged and lighted figure subjects and stupidly chosen landscapes among our productions, than there are among the exhibited works of our elder brethren of the brush and palette. Primarily we might expect this. The artist has first of all that inborn spur which presses him forward and will not let him rest at any other than *this* profession; then he has years of patient study and training the hand to do the behests of the eye—teaching it to carve the lily, or to paint the varied hues of the landscape, or the delicate bloom on the cheek of beauty, till with a few movements of its wonderful mechanism it can draw the most delicate line or lay on the most subtle gradation of colour. But still, with all his born genius and acquired skill, we find the artist falling short in many respects of the effects produced by our skilled manipulation and nearly perfect instruments. It is true that with all our wondrous accuracy of delineation we do not approach in truthfulness of colour to artistic representation, however much we may surpass it in minuteness of detail or general correctness of form; and, while yielding as gracefully as we may, let us not forget how far *we* fail in rendering truthfully that Nature we think we represent so well. Indeed it is only by an intellectual effort that we can be said to do it at all.

Our pictures, being in light and shade merely, must be looked on more in the character of engravings or drawings in monotone, where the essential forms of objects are represented conventionally by lights and shadows more or less true, ignoring, as it were, the glorious accessory (if I may so call it) of colour. You will now see that, if we desire to produce good pictures (not bits), that we have the more need to be able to select or compose such materials as will make perfect pictures in black and white, limited as we are to shade and its gradations; and that there is the greater need that we be able to know how to choose such classes of objects as will be best represented by our art. If we can, by the examination of a large number of examples, deduce any rules for our guidance, we ought to do so. To show that this is perfectly legitimate, I will quote the authority of Sir Joshua Reynolds, than whom we have no higher. He says in his sixth discourse:—"It must of necessity be that even works of genius, like every other effect, as they must have their cause must likewise have their rules. It cannot be by chance that excellences are produced with any constancy or any certainty, for this is not the nature of chance; but the rules by which men of extraordinary parts, and such as are called men of genius work, are either such as they discover by their own peculiar observations or of such a nice texture as not easily to admit of being expressed in words—especially as artists are not very frequently skilful in that mode of communicating ideas. Unsubstantial, however, as these rules may seem, and difficult as it may be to convey them in writing, they are still seen and felt in the mind of the artist, and he works from them with as much certainty as if they were embodied, as I may say, upon paper. It is true that these refined principles cannot always be made palpable like the more gross rules of art"—and so on.

It cannot be expected that I shall be able, in the short time left me, to go very minutely into those questions which have employed the best minds during years of study, and have occupied many volumes; neither do I mean to set up my small canon against the great guns who have written on the subject. If I did, I suspect they would blow me to pieces for many of my heterodox opinions—that is, if they thought me worthy to be made such game of. All I can do is to simply indicate a few of the most elementary forms which experience has taught or genius shown to be those the human eye is pleased or displeased with; and in doing so I have no wish to open the very debateable question of innate ideas, but simply to show what is conceived to be right, artistically, and what wrong, at this stage of the world's progress.

[The speaker here exhibited a number of sketches, diagrams, photographs, prints, &c., in illustration, and commented on them in passing, in relation to their arrangement, picturesqueness, lines, light and shade, and other peculiarities. He then proceeded to say:—]

Perhaps the first principle to be noted in landscape delineation is that of the height of the horizon. For fine pictorial effect, this should never be in the centre of the subject, but either above or below it—as, for instance, in this view [exhibiting one] of *Eyemouth Harbour*, where the line of the pier, the harbour, with the shingly promontory beyond, and the distant sea, all come in a horizontal line right in the centre of the picture. I wish that I could have shown you a print of E. T. Crawford's fine picture of the same subject, which I am sure many of you know, to exhibit by contrast the difference that the view-point makes in taking a picture: you have evidence here, however, that by removing the camera more to the left, and getting the pier more foreshortened, that even this picture, poor as it is, could have been much improved. This is one of the points which, for photographers, is sometimes difficult; but we must endeavour to avoid it, if possible. If the subject requires a high horizon, you will be safe to keep it about two-thirds of the height of the plate: if it require a low horizon, as for coast scenes, &c., about one-third or three-eighths of the height of the plate.

FIG. 1.



Again: it is wrong, where you have to take such a picture as *fig.* No. 1 (which consists of an avenue of trees going right into the

centre of the picture, with a tall poplar on each side of the head of it, and an equal-sided tree, placed as an after-thought, right in the centre), to do it in this way, where, by so treating it, one-half of the picture is almost a facsimile of the other. You do not quite fancy, but you feel that invisible line running down the centre of it, and you find yourself mentally with your measure trying whether it is so or not. It is a very common error with stereoscopists this of getting an avenue of trees right in the centre of the picture, with the view of showing the perspective. The large tree in front is on the same principle, and to carry it out you have a poplar on each side for the purpose of balancing each other in the invisible scales, which you feel sure must have been hung there to try if they were in their proper places. It really puts one in mind of the anecdote of the Dutch gardener who caught the boy stealing apples, and put him in the stocks in one corner of his garden, but finding his eye for uniformity so much pained by one boy in the one corner, he put his own son in the other corner to balance him.

FIG. 2.



Fig. No. 2 is a similar subject; but you see how different is the treatment. You have the large tree, the avenue, the poplars; but all arranged pictorially. From this I think we may deduce that when the subject is a single one, or capable of being too equally balanced, the centre of such a subject should be placed on one side or other of the plate, as may be found most suitable, but never in the centre of the plate.

FIG. 3.

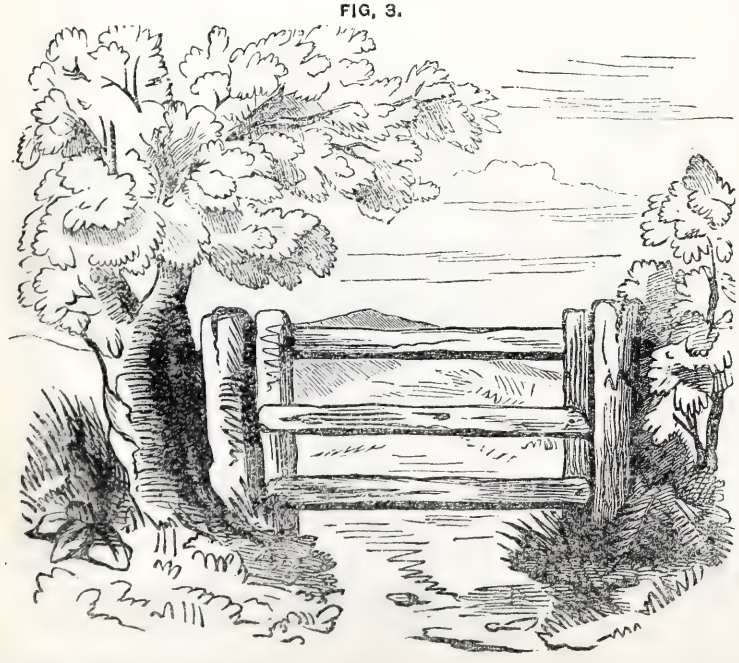


Fig. No. 3 is a somewhat different illustration. It is, as you see, a rustic gate, with a field behind, a tree on one side, and some shrubbery on the other. Of course you have a full front view of it as if it were of the utmost possible importance that we should see its construction, and with it a distinct unmistakeable statement on its face that there is no admission, or as if the maker of it wanted what an architect would call a view of the front elevation of it. If it be possible to annihilate the picturesqueness of such an object I think it has been managed here.

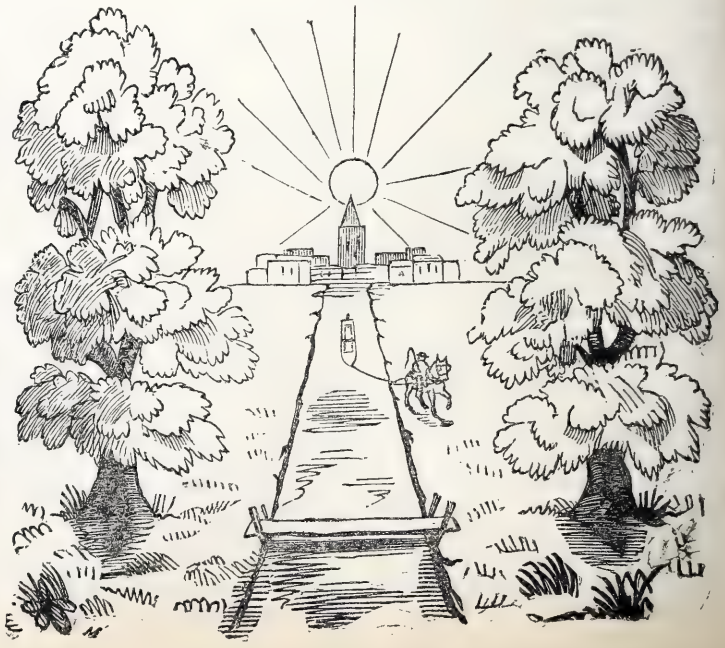
FIG. 4.



Fig. No. 4 is the same gate, but is a slightly different view of it. It is now inclined to the spectator—indeed it is what an architect would call a perspective view of it, and, as you see, the parallelism of the lines being removed the pictorial effect is much heightened, although it is by no means the best that can be made out of an old gate. Witness this print from Collins's picture of the *Woodland Gate*, or *Happy as a King* (from the Vernon Gallery): there you see in perfection what can be made of our friend the old gate. This is perhaps as perfect an illustration of what can be done in the way of landscape composition as I could bring before you. The figures assist the landscape, and the landscape, in return, with its quiet repose, contrasts so finely with the happy abandonment of everything but fun by the juvenile Joskins, that we cannot help admiring and loving the producer of so excellent a picture.

Nos. 6 and 7 are diagrams of a railway tunnel, with a train passing through, made with the intention of showing that, in all perspective views of architecture, it is unwise or unpictorial to place the vanishing point of the lines in the centre of the picture, as it is in No. 6; and although the direction as to the height of the

FIG. 9.



horizon has not been observed in No. 7, you see that by placing the vanishing point more to the right of the subject, and the train more to the front and left of it, the pictorial effect of a very unpicturesque subject has been much heightened. The same rule applies to all lines of street architecture: the light must if possible always be on one side, so that we may have the other side in shade, in order to get a proper contrast by the cast shadows of the buildings.

The photograph No. 8, which was taken as a trial plate, will illustrate my meaning. You have the sun on the right, with the cast shadows across the street, and breaking up here and there on the sun-lighted portions of the other side. Then you have another important point shown—that your figures, if any, should not be in the centre of the composition, but more towards one side than the other.

FIG. 10.



Figures 9 and 10 are landscape illustrations of the central principle:—the first, with the Dutch canal-like rivulet running straight up and into the picture, the blazing sun in the centre, and the trees on each side, all so nearly balanced, that you find yourself saying that the artist's point of view must have been from a boat in the middle of the canal. The other, which ends the series and my paper, is a similar view, showing that variety of size of the trees, the curvature of the water, variety in the form of the banks, difference of vegetation, all go to make what was a very uninteresting meadow into a rather picturesque bit of landscape.

In conclusion, I only wish that my remarks may elicit the opinions of those more able to give them than I have been to explain what I meant to say.

ON ALKALINE TONING.

By A. Robertson.

[Read at a meeting of the Glasgow Photographic Society, Nov. 7, 1861.]

It seemed at the last meeting to be taken for granted that I was this evening to express my views upon the subject of alkaline toning.

I need hardly say that toning our prints well is a very important matter. It stands, I believe, next to fixing; for fine shades of colour that please the eye are as much wanted as permanent prints. Success in toning will gradually lead to an increased public demand for our works. Some admire a fine lithograph, others a fine engraving; but to me a good photograph, well printed, is better than any plain paper picture. I think most of my hearers are of the same opinion as myself on this point.

If any acknowledge the importance of finely toning their prints, it is necessary for them to give a great deal of attention to it; for, simple and successful as many find this process, yet so varied are the results, and so numerous are the failures which some experience, that it is evident no single rule can be laid down that will lead to the same results in various hands.

It is unnecessary to search into the history of this alkaline toning process; nor is it desirable that we should follow the different improvers of it. It is enough for our purpose that Mr. Maxwell Lyte was the true author of it, as he gave it publicity and importance; and, if we do no more, we should at least accord to him our thanks and gratitude.

This toning process is of but recent date; but, like photography itself, is of rapid progress. Little more than three years have elapsed since it was introduced, and already it has nearly superseded every other toning process; and so it should, for the best of reasons—its results are more beautiful and more enduring.

Allow me in but few words to say how this process is conducted:—

With good albumenised paper use a strong silver bath, say—

Silver...	90 grains.
Water	1 ounce.

Float the paper on this bath for two minutes. Some advise that you should print very dark, while others say a little darker than the finished print is wanted is enough.

Now I think this must depend on the state of the chloride of gold and the amount of carbonate of soda that is used. If you use much soda you will find the prints bleach out a good deal.

When you have your printing all done for a day, collect the proofs and carefully cut off all the superfluous paper, and keep this, for at some convenient time a great deal of silver can be taken from it. You now put your prints into a dish of water, and let them remain there for about ten minutes. Pour off this water into a large jar or barrel. Give your prints another supply of water, and this time you may put in with them a little salt, to take out all the free nitrate of silver. After remaining in this for ten minutes, you pour off again into the barrel. You may give them one or two waters more: these are hardly worth keeping. It is important that you wash your prints well at this stage, for here arise stains and much of the unevenness that is complained of; and you must not put in the salt before the prints, for it makes a great mess of the silver surface. The importance of keeping your washings and parings is seen from such tangible results as these buttons of pure silver that are worth several pounds.

Your prints being ready you now mix your toning-bath—

1 grain chloride of gold to each sheet of paper.
4 ounces of water.

Neutralise by adding a little saturated solution of carbonate of soda. A small piece of litmus-paper shows the proper amount of soda.

It is of great importance to have good pure chloride of gold.

I believe it to be a mistake to recommend any given number of grains of soda; for there are scarcely two samples of chloride of gold that are alike.

As you have the bath ready, now take the prints out of the water and lay them evenly and rapidly on the bath, turning them over several times, and be sure there are no air-cells or parts of the albumenised surface that are uncovered; for if there be any only for a second or two, you are sure to have a bright red stain. You must watch your prints in this bath till the tones you require are obtained; then transfer them to a dish of clean water, give them two or three turns through it, and then place them in the fixing bath—

Hyposulphite of soda	1 ounce.
Water	5 ounces.

Keep turning the prints in this for fifteen minutes, then drain off all the hypo. Wash well in your delf tray, then place your prints in the syphon washing-bath and allow them to be washed by this means for say ten hours, turning them at times: if you can give them a washing or two with hot water they will be all the better.

I have now told you in my own words how alkaline toning is done; and, having thus opened the subject, I leave it for your future consideration.

Heroic Conduct of a Well-known Photographer.—At the late accident when the Scarborough life-boat was stranded, and the receding waves carried away the crew ere they could make good their footing, a rush to their rescue was made by a number of individuals in the crowd assembled on the beach, foremost amongst whom was the ill-fated Lord Charles Beauclerc, together with Mr. Sarony, photographer, and one or two others. Another wave carried them all off their legs, and those who came to save were alike imperilled. Two or three times they were carried out and back again. The remaining details are too well known to need recapitulation. Lord Charles Beauclerc lost his life in the endeavour to save the life of others. Mr. Sarony was rescued by two brave fellows when much exhausted.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

HYPOSULPHITE OF SODA.

Synonymes.—Dithionite of soda.
Composition.—Na O, S_2O_2 + 5 HO.
Equivalent.—125.

Preparation.—This salt is now manufactured on a very extensive scale in the neighbourhood of Newcastle-on-Tyne. There are several methods extant for its preparation; two only (the easiest of manipulation) need be described. In the *Chemical Gazette*, for August, 1843, a process contrived by Herr Walchner is published. It is as follows:—One pound of dry carbonate of soda is mixed with ten ounces of sublimed sulphur, and the mixture heated in an open porcelain dish to admit of contact of air: the mixture should be kept stirred, when under these circumstances the sulphuret first formed passes, with slight incandescence, into sulphite of soda, which is dissolved in water, filtered, and heated with a further quantity of sublimed sulphur. The heat should be gentle, say 180° F. and continued for some time. On concentrating the filtered solution, crystals of hyposulphite of soda are obtained.

The second method consists in the formation of a neutral sulphite of soda by passing sulphurous acid gas through a strong solution of carbonate of soda, and subsequently digesting the solution with excess of sulphur at a gentle heat during several days. For this purpose it will be necessary to obtain, first, a flask of about one pint capacity: into this should be introduced either some pieces of charcoal or some copper turnings; the mouth should then be closed with a cork perforated with two holes, in one of which is to be placed a tube funnel and in the other a bent tube, the end of which should be conducted into a wash-bottle containing sulphuric acid, for the purpose of absorbing any impurities which may come over with the sulphurous acid gas. The mouth of this wash-bottle should also be closed with a perforated cork, one hole receiving the end of the bent tube from the generating flask, and the other being furnished with a similar bent tube to conduct the gas into the strong solution of carbonate of soda. The apparatus being placed in position, and the flask being conveniently supported on the ring of a retort stand, for the application of heat, sulphuric acid is poured in through the tube funnel mentioned above (the end of which should reach through the charcoal or copper turnings to the bottom of the flask), and the heat of a spirit lamp is applied. In a few moments bubbles of sulphurous acid gas will be seen to pass through the wash-bottle: these will soon reach the solution of carbonate of soda, causing a lively effervescence of carbonic acid gas; when this ceases the formation of the *sulphite* of soda may be regarded as complete. It now remains to convert this into hyposulphite of soda, for which purpose it will be necessary to pour the solution of sulphite into an evaporating basin of suitable dimensions, and add thereto an excess of flowers of sulphur, *i.e.* sublimed sulphur; a gentle heat should then be applied and maintained for some time, occasionally as long as two or three days. For this purpose a sand bath is obviously the most convenient; but, should the experimenter be deficient in laboratory appliances, a gentle heat may be maintained in action on such a solution as is described above, by taking an ordinary saucepan, filling it with water, placing the basin containing the solution on the top, instead of the cover, and putting the whole on the fire. Should any mechanical impurities enter the solution in the form of dust or soot, these can be separated by filtration, at the conclusion of the process. This process is merely described for those who, being beyond the reach of chemists' shops, cannot obtain either hyposulphite of soda or sulphite of soda, but who yet may be able to get some oil of vitriol, charcoal, carbonate of soda (or common washing soda), and some "flowers of sulphur," and who may also possess the necessary apparatus.

Properties.—Hyposulphite of soda crystallises in large, clear, colourless, oblique prisms, belonging to the right prismatic system. They include five atoms of water of crystallisation, equal to about thirty-six per cent. of water. The salt is soluble in all proportions in water, but insoluble in alchohol. At 54° F., 100 parts of water take up 81 parts of hyposulphite of soda; it is inodorous, and tastes cooling; afterwards bitter, slightly alkaline, and sulphurous. At 122° F., the salt melts in its own water of crystallisation. It is probable that the pure salt would not possess any alkaline reaction, though many commercial samples restore the blue colour of reddened litmus: this is attributable to the presence of traces of carbonate of soda, arising in the manufacture of the salt from the employment of too high a temperature in heating the sulphur and carbonate of soda together. This salt, when pure, is unaltered by exposure to a moderately dry atmosphere, though it deliquesces slightly in damp air. Heated in the open air it burns with a blue flame; in close vessels the aqueous solution deposits sulphur; the same thing also happens if the solution be exposed to the air. An aqueous solution containing 250 grains, or two equivalents, of this salt will take up 126 grains, or one equivalent of iodine, without becoming coloured, and still remaining neutral. This reaction is accompanied by the formation of iodide of sodium and tetrathionate of soda, and forms a convenient method of estimating the purity of the sample so treated.

Impurities and Tests.—Hyposulphite of soda is now manufactured in such large quantities, and sold at so low a price, that the absence of any great pecuniary advantage to be gained by intentional adulteration almost ensures its coming from the manufacturer in a state sufficiently pure *even* for photographic purposes, except, perhaps, the accidental impurities arising from the particular process followed in its preparation. These may be sulphuret of sodium, sulphur, carbonate of soda, sulphite of soda, and perhaps sulphate of the same base, this latter salt being, it is believed, sometimes intentionally introduced. Silica is also an impurity found in some samples.

Carbonate of soda would cause the suspected salt to exercise an alkaline reaction on test paper, whereas pure hyposulphite of soda should be neutral. Each and all of the other impurities would act by decreasing the per centage of pure salt in a hundred parts. A test, therefore, which will indicate whether the right proportion of pure hyposulphite be present in a weighed quantity of the salt will be found all-sufficient for the photographic analyst, who, it is assumed, desires not so much to determine the presence of each particular impurity, as to ascertain the relative value of samples submitted for his examination, with the view of arriving at their applicability or suitableness for photographic purposes.

This result may be arrived at by weighing out one drachm of the salt to be examined, dissolving it in one ounce of water, and then adding half a drachm or thirty grains of solid iodine, and stirring the mixture until the whole of the iodine is dissolved and forms a *colourless* solution. Should the whole of the iodine not enter into solution, it is an evidence that the sample under examination does not contain the proper per centage, or, in other words, is not pure hyposulphite of soda. It would avail but little for the photographer to determine what the precise impurity is: the fact of its being unable to take up and form a colourless solution with the above proportion of iodine is sufficient to warrant its immediate rejection. The reaction which takes place in the above experiment is accompanied by the formation of new salts, tetrathionate of soda and iodide of sodium, and hence the colourless character of the resulting solution.

Uses.—Hyposulphite of soda was first suggested as a "fixing" agent by Sir John Herschel, and though it has been much abused as being to a great extent the cause of the fading of positive proofs on paper, it has done and continues to do good service to the photographer, holding, perhaps, the foremost place among photographic chemicals in regard to the *quantity* consumed, which amounts to many tons annually. Its suitableness for the purpose to which it is applied depends on the power which it has of forming soluble double salts with the oxides, iodides, bromides, and chlorides of silver. Taking, by way of illustration, a wet collodion plate (after the developing solution has been washed off, and the picture in other respects completed), it may be stated that when a solution of hyposulphite of soda is poured over the plate, and is thus brought into contact with unaltered iodide of silver, there takes place what is termed by chemists a double decomposition, the acids and bases change places, and the reaction results in the formation of iodide of sodium and hyposulphite of silver, which latter salt immediately on its formation is dissolved by the excess of hyposulphite of soda, and this is indicated by the transparency thereupon acquired by those parts of the picture unacted on by light. A similar change takes place when hyposulphite of soda is brought into contact with unreduced chloride of silver in positive paper prints; and it is of the utmost importance that this fact should be remembered, as the hyposulphite of silver so formed has a tendency to pass spontaneously into sulphide of silver—a black substance, which would mar the beauty of the proofs. This fact should prompt the photographer to renew his fixing solution very frequently, always remembering that "there is nothing like *fresh hypo.*"

Effect of Internal Use.—There is no case of poisoning by this substance on record. Should it be taken, however, with suicidal intention, it might, from analogy, be expected to act in a somewhat similar manner to sulphate of soda, or sulphate of magnesia; in

which case it would work its own cure; and no antidote, strictly speaking, would be required.

Antidote.—The internal administration of this salt, while, doubtless, producing effects similar to sulphate of magnesia (Epsom salts), would most likely, in large quantity, produce also inflammation of the mucous lining of the stomach and intestines; in which case emollient and demulcent drinks, such as milk, albumen, linseed tea, &c., may be suitably given.

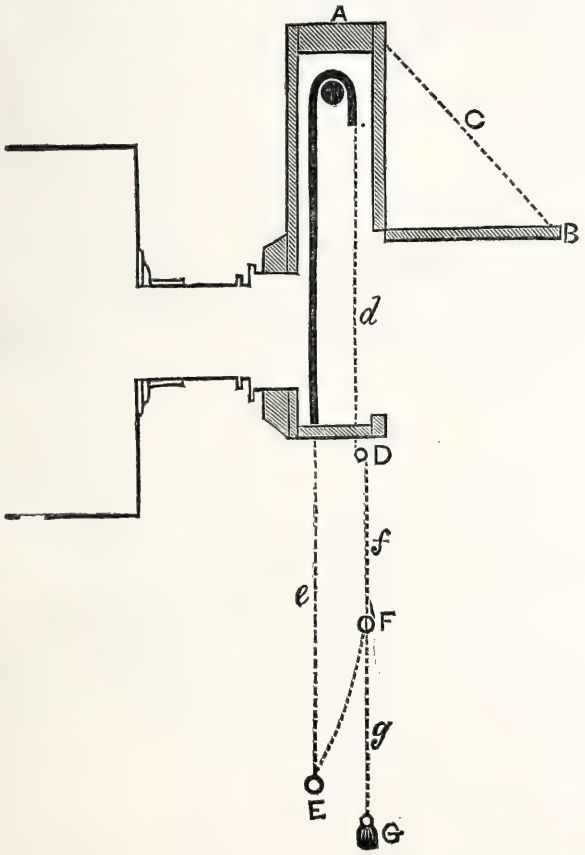
DESCRIPTION OF A NEW INSTANTANEOUS SHUTTER,

Invented by Mr. WINDOW, *and Manufactured by* J. H. DALLMEYER.

[Read at a Meeting of the London Photographic Society, November 5th, 1861.]

THE advantages of this contrivance over others designed for the same purpose may be stated thus:—It effects the opening and closing of the lens by one continuous movement, and this movement is so contrived that the foreground receives the greater amount of exposure, thus favouring the production of natural skies, similar in this respect to the one introduced to the notice of this Society by myself, in January, 1860. At the same time, also, the exposure in this shutter can be regulated at will, from a fractional part of a second to two or three seconds or more.

It is, therefore, equally applicable for portrait lenses in the studio, where the exposure is of some seconds in duration, or for instantaneous work in the field, where the exposure is completed in a small fractional part of a second.



It consists of a small box A, which fits on the hood of the lens. The front B, when in use, is kept open by means of an elastic C, and serves as a shade to the lens. Inside the box, at the top, is a roller, working on points at each end. Over this roller passes the shutter, which is of a flexible material composed of wood strips glued upon leather: this is represented in the section we have given by the thick line. From each end of this curtain or shutter depend strings *d* and *e*, terminating in the rings D and E. Another string *f* joins these rings together, and finally from the ring F placed in the middle of *f* proceeds the string *g*.

By referring to the diagram it will be seen that when either ring D or E is pulled down as far as it will go, the shutter is entirely closed. If it be now desired to uncover the lens for a definite time, as for a portrait, or dry-plate landscape, the string *g* is pulled down, which will raise the shutter half way, and fully uncover the lens. When it is wished to re-cover the lens, either of the rings D or E is pulled down as far as it will go, and the object is effected. If an instantaneous exposure, as it is termed, be desired—that is, one of only a fraction of a second in duration—the ring D, as shown in the drawing, is pulled down with the speed required, and this one movement will open and reclose the lens. It will also be noticed that the after part of the shutter rising, the lens is uncovered from the bottom, and the foreground is the first thing exposed; and the front part of the shutter descending, the lens is re-covered from the top—so the foreground is the last thing exposed.

ON THE NATURE AND TONING OF THE PHOTOGRAPHIC IMAGE.

By T. A. MALONE, F.C.S.

Director of the Chemical and Photographic Laboratory of the London Institution.

[Delivered at a Meeting of the London Photographic Society, November 5th, 1861.]

THE subject which engages our attention to-night is, it will be admitted, one of great interest and importance, and yet is not without its difficulties.

What, may I ask, *is* the photographic image? and in what manner is it acted upon by the various agents employed in its production and toning? Many answers have been given to these questions. A very decided one has been given by a gentleman to whom we are much indebted, and whose absence we all, and I especially, regret to-night. I, of course, allude to Mr. Hardwich. It is well known that considerable difference of opinion prevails amongst us on this subject. Some hold that the organic matter and size of the paper serve merely as a vehicle to support the chloride of silver, on which the image is essentially formed; others hold that the organic matter serves as an adjunct in producing the image, and remains combined with it. There is no doubt, however, about chloride of silver being the basis of our operations. How does light act upon this chloride of silver?

The question has been answered by men of some eminence as chemists. Mülder, a Dutch chemist, has written an essay upon the method of assaying silver by what is called the wet method. It is usual, by the established method, to assay it by fusion, but now it is proposed to assay it by solution. Mülder was led to investigate the production of chloride of silver. He found, in the course of his work, that this chloride of silver was liable to be darkened by the action of light; and he wanted to know, exactly, what this action might be—to what extent it was carried on—and what influences were exerted. We know that chemists, who have treated the subject previously, have given us their views. Fresenius, one of our eminent German analysts, says "chloride of silver, exposed to light, loses weight," and there he leaves it. Others have gone a little further, and say that it loses weight by losing chlorine. Exposure to the sun's rays liberates chlorine. The action of light seems to reduce chloride of silver to a state nearer the metallic. Then comes the difficulty—does the light remove the whole of the chlorine? Some hold that it does remove the whole of the chlorine, that is, as far as the action of light can go. Mülder says that it only reduces a portion of the chloride, and forms a subchloride of silver. Unfortunately this which at first sight appears to be one of the simplest of chemical problems becomes exceedingly difficult, on account of the nature of the process. Many here know that Mr. Spiller, of Woolwich, in the arsenal laboratory, has exposed chloride of silver to the full sunshine on the roof there, but never could succeed in liberating the whole of the chlorine; and it will be evident at once that hence arises the difficulty. Upon the face of things, we know that light blackens this substance. If we expose a bottle of it to the sun the surface is darkened, but that darkened surface shades the bottom. Each molecule of the surface, or perhaps I might say the surface of each molecule, has its chlorine taken away and there is a perfect reduction to the metallic state: that reduction alters the colour of the surface and no longer allows the chemical force to penetrate efficiently, thus a nucleus, or core, of chloride of silver remains. If this darkened substance be treated with hyposulphite of soda, ammonia, or cyanide of potassium, we find a singular result—the dark body disappears, and gray spangles of silver appear. So far all is clear, and I believe that the silver which is liberated from the surface of the molecule is set free from the chloride by the action of these solvents, and thus we have the thing dissolved perfectly into its elements, so far as we can expect. But this difficulty arises:—the gray spangles bear no resemblance to the darkened substance on the surface, and again, the quantity of silver is so small that it does not appear credible that it can give colour to the extent that it is known to do in photography. It will be my purpose, to-night, to combat the idea that it does not produce this result, and to give a rational

ground for my opinion as to what becomes of the black surface, and why we get gray spangles, and to show you what we can do chemically with silver and with gold. What are those spangles? They are not oxychloride of silver, as it has been suggested by some, nor are they, as it has been suggested by others, a low oxide accompanied with organic matter. Every endeavour hitherto has fallen short of a determination of the question, the difficulty being in the analysis. I, therefore, propose to get rid of the difficulty of analysis altogether, by abandoning the system and working synthetically, which may appear hazardous; but I may mention that I have the opinion in my favour, and the encouragement, of a gentleman who is a most eminent chemist in this country.

The method of synthesis is a fair one, and will help to clear up the difficulty for us. It will be confessed that all analyses have failed; and I may state that I have been led to adopt this method of synthesis by the study of Mr. Faraday's paper, of 16 or 17 pages, on ruby gold, in the *Philosophical Transactions*, which will, perhaps, repay any one for reading. I was led to see that a method of synthesis, founded upon the methods adopted by Mr. Faraday in the production of ruby gold, might solve our difficulty. I may hasten matters by stating my conviction at once. If I am mistaken in my view with regard to the possibility of the various colours and tints of the image being due to the mechanical division of the silver—if I am wrong in this, then Mr. Faraday's views, with regard to the ruby gold being the true metal, must fail. I am free to admit that it is equivocal, for Mr. Faraday has done nothing but show us good reason why we should consider the ruby gold as the metallic gold. He will require that we shall give him the atomic constitution and weight of this ruby gold before he believes in it: for example, we must take a given bulk of this gold, then ignite it to the point of fusion, and then re-weigh it again, and show that it has not lost in weight, and then he will convert it into metallic gold. Our interest is much more excited from the moment we find that it is possible to believe that we can have ruby silver as well as ruby gold, and when we find also that this ruby gold can be converted into blue or purple gold, thus giving the two extreme ends of the solar spectrum, and when we find that we can also get not only ruby silver and blue silver—the two ends of the spectrum—but as I think I can show you we can have yellow silver also.

I think if I pursue analogous processes to that of Mr. Faraday, we can come to no other conclusion than that these bodies have a wonderful analogy; and, when viewed in this way, we can explain every phenomenon as to the toning of the pictures, for we have the ruby silver picture destroyed by the gold, by the mere physical change. The particles are so altered in magnitude or thickness as to affect the rays of light in a different manner, and this will lead us to understand the whole of the phenomena which have hitherto baffled us. I have said, in times past, that I saw no reason why this image should not be finely-divided metallic matter.

Let me at once bring before you the manner of producing ruby gold. Gold is soluble in nitro-muriatic acid, and it is desirable to have altogether pure gold, which is not very easy, but by great care we can obtain it. I placed some in this little vessel. [Mr. Malone exhibited a glass jar containing about an ounce of liquid.] I then placed it in a sand stove, and allowed the acid to evaporate. When taken away it had a darkish red colour, which was a sign that the whole of the acid was expelled, which was essential. Then, having pure chloride of gold free from acid, we dissolve it in water: the strength is not material, and it is very easily soluble in water. I will now add water to this, and thus I have now the yellow solution of the chloride of gold. This chloride of gold is now ready for use. The gold may be reduced from this solution in a variety of ways. If we add oxalic acid to it, and reduce it, it is found that the affinity is such that the chlorine quits the gold—the gold is let fall. In this way we can get pure gold from the solution of this chloride of gold.

Again: by the addition of protosulphate of iron it readily absorbs oxygen—the chlorine acting with the elements of the water forms a per-oxide and we get a salt: the chlorine being taken away the gold falls. But by neither of these methods do we get it in the ruby condition. With the oxalic acid especially we get brilliant flakes, while by the sulphate of iron we get the gold thrown down in a purplish or brown powder.

There is another method of throwing it down—by the chloride of tin. When chloride of tin is mixed with chloride of gold it falls down. I allude to these cases to point out the importance of the influence we employ in the reduction. Our agent is light, which produces the chemical result called reduction, just as do the three agents I have mentioned effect the reduction in the laboratory. When chloride of tin is used it has a peculiar purple appearance, and is well known as the purple of Cassius, which for a long while chemists considered as a compound of gold and tin. Mr. Faraday has shown that it is nothing else but gold in a finely-divided condition. But by neither of these processes have we ruby gold. We can reduce the gold by phosphorus. A piece of phosphorus placed in a solution of gold and silver will reduce it. I do not mean phosphorus in the mass, because that takes time. It takes away the chlorine from the gold, and the oxygen from the nitric acid in the nitrate of silver, and the gold and the silver fall down; but they fall down not in the lustrous condition, but in the condition of a powder. Analysis has shown that in this way we get the pure metals reduced. I take a small piece of phosphorus and find a solvent. Bisulphide of carbon is a solvent. Again: ether is a solvent of phosphorus, and some may remember that for the purposes of the electrotype a portion of a plant is dipped into a solution of phosphorus in ether, and then dipped into a solution of nitrate of silver; the phosphorus reduces the silver upon the plant, which is then dipped into the solution to electrotype. This reminds us that we can get metallic silver by the action of the phosphorus upon the nitrate of silver. I need not say that ether and phosphorus are both so exceedingly inflammable that the greatest care must be taken in their manipulation. We have here some ether, which is a substance, an organic fluid. containing merely simply carbon, hydrogen, and oxygen. In it there is no metal—no base of any kind. We have also phosphorus, and bring it in contact with chloride of gold held in solution in water. These are the elements with which I am dealing, and you will see how they act when I pour it in. [Pours some in.] Yes, there, you see it is already beginning to act. By this light the colour is scarcely ruby. I will now try to produce a phosphorus light to view it by. There we have now a decomposition of the solution of chloride of gold rendered evident, and it will go on if there is phosphorus enough, until the whole of the gold is thrown down in a wonderfully fine state of division, divided to such an extent that it was thought to be a mere coloured solution. A solution of this kind has remained several years without settling. I have seen some in this college which has remained in this condition for a long time. Its density in this condition, although gold, is so small in its divided molecular state that it remains still diffused through the water. Then, again, this apparent solution of chloride of gold has become almost opaque where the greatest quantity of gold has been thrown down; and the colouring power of silver is produced in a somewhat analogous manner. Everything must be perfectly pure and clean, and the ordinary mode of washing bottles is not always sufficient. In this case, I can judge for myself that *this* is not ruby, but more of a port wine colour. This is an important point. It is a very beautiful experiment. You see how greatly I have to dilute it, and, therefore, the colouring power is enormous. I can scarcely dilute it sufficientl yto admit of the passage of light. After a time it does deposit, and then no precipitant of gold can detect any gold in the upper part of the solution if you use phosphorus; and it is this circumstance of settling that has introduced a difficulty into Mr. Faraday's investigation—he has not attempted to give us an analysis of the body. It might be evaporated and the pulvurent body weighed. I poured a sample of it into a test tube, corked it up, and took it to a friend's laboratory to show him the difficulty, and in two or three days the whole had settled, very much to my surprise. I do not know whether it is in consequence of the narrowness of a test tube, or of something in the glass, but this substance will settle in narrow vessels, and in that way I have obtained a comparatively large quantity of it. If you pour it on the filter it penetrates the matter of the filter, and forms a black mass. Having found out the way of getting it, I shall have no serious difficulty in getting at its atomical constitution.

Having shown that in this way I can precipitate gold, let me now make an analogous experiment with silver. Here is nitrate of silver. You remember that chloride of silver is insoluble in water; therefore, we take the nitrate, and we shall find that, although it may depend upon the salt we use as regards the colour of the result, it will not be so as regards the required result. I take the water, and now add the phosphorus to ether. If this should not succeed, not having sufficient phosphorus to overcome the acid, I will use the bi-sulphide of carbon solution You see there is a tint, with a slight appearance of brown—in fact, we have many photographic pictures which, when toned, present this exact appearance. Now, I will treat this by diluting it with some water, and you observe the same tint: it is almost black even now, and

we can have gold and silver, coloured evidently by this reducing means, in this pure state of division. There is no question here about organic matter in the sense of albumen or caseine, or any of the organic matters used by photographers. I am aware that, if you take a piece of gelatine, and steep it in a solution of nitrate of silver, and expose it to the light, it becomes darkened, and by solution in potash, it becomes a blood-red colour. For some reason that acted strongly upon Mr. Hardwich's mind, he was satisfied that the blood-red colour given was due to the oxide of silver combined with the albumen or the organic matter. Now, of course, my mind is biassed in favour of those views with regard to the possibility of these metals giving us colours in a fine state of division; and I contend that I have just as good a right to say that this sample is ruby silver as that the other is ruby gold, for the silver is, I believe, reduced just in the same way chemically as the gold is reduced here. In short, here is ruby silver in the place of ruby gold. When citric acid is used a red body is obtained, which is stated also to be organic salt; but I take the liberty of observing that no rigid analysis of the salt has ever been made. And I would observe, that if we grant that they are in a finely-divided state, we must not look at these bodies with an ordinary chemical eye, for they are dissolved in a variety of chemical reagents, and, therefore, the ordinary qualitative experiments—as they are called—are fallacious. I cannot carry this out to-night; but I shall be glad if others will take up the subject. If we take it by settling and filtration, we can easily mix this with gelatine or other substances used in photography, and we can simulate the photographic body, and then treat it with the various chemical agents that we have been in the habit of testing photography with, and I think it does re-act in the same manner as the ordinary photograph; and in this way the photographic question is to be solved. I shall, I have no doubt, be asked to produce this body, and show that it is ruby silver. If, by synthesis, we can produce bodies which are identical in chemical properties with the photographic image, I think that will satisfy a rational mind with regard to the true nature of the photographic image. Time itself may cause this blood-red solution to deposit its metal; but the action of the potass increasing the density of the fluid prevents the deposit of this finely-divided metal. As I believe I have said, I will endeavour to show the colour of these by lights; and for this purpose my plan is a little novel—and by-the-by, I believe I was the first to use phosphorus and oxygen for the purpose of a photographic lecture. I have here a bag of oxygen which belongs to part of an apparatus for the oxy-hydrogen microscope. You know that oxygen is heavier than atmospheric air, and if I pass the oxygen from the bag through this flexible tube into this bottle, I shall displace the common or atmospheric air; and as a proof that I have now displaced it, I will test it with this match. [Mr. Malone here ignited a wooden splint, blew out the flame, and inserted the smouldering fire just within the mouth of the jar, when the splint burst immediately into a bright flame by the action of the oxygen.] Now, instead of this match, I have here a piece of phosphorus which I will insert within the jar, and direct your attention to these three jars in front of it, containing the ruby gold, the purple gold, and the ruby brown silver, in order to give you what chance there may be of observing the tint, though I am afraid it cannot be evident to all the sides of the room. [Mr. Malone then burned the phosphorus within the oxygen, and thus transmitted a vivid white light amongst and through the finely-divided suspended metals, exhibiting the colours so beautifully bright as to elicit considerable approbation.] It is so far convenient because it gives us a white light, which I believe for this purpose is equivalent to the sunlight. This light is reflected by the white substance forming upon the inside of the bottle, which is phosphoric acid, and the light is more white than the electric light, and perhaps whiter than the Drummond light.

I have still further to make good my statement that we can precipitate gold and silver in forms having various high colouring powers, and this without uniting with other matters which form oxide of silver. I may observe that if we take the ruby gold, for example, and mix it with certain chemical reagents—hyposulphite of soda, for instance—strangely enough the ruby goes, and we get the purple colour with which we are so familiar in toning. It was said formerly that the purple colour was produced by sulphuration. I deny this, for we find that common salt, containing only chloride of sodium, will convert ruby gold into purple gold; and we must, therefore, discard the idea that sulphuration has taken place. Be this as it may, when we add common salt to ruby gold, it can hardly be supposed that we there form a subchloride of gold, which is yellow. If my view of the matter be the true one, the thing is perfectly clear. Any body in nature, if sufficently divided, can be had of any colour: a soap bubble, or a plate of any thickness, will give us any colour, but it is difficult to find out the process for each body. In gold and silver, I think, we have found out the processes. We know that gold, when very thin, is green when seen by transmitted light; but Mr. Faraday found one part, which had been pressed, which gave a red tint when seen by transmitted light. Now, I will make the experiment of the change of ruby into purple gold. I will mix a portion of this so-called ruby liquid, which is more purple now than I like to see it. However, I will mix it with hyposulphite of soda solution. Here is some of the original ruby liquid, and *this* other has now become darkened by the action of the soda. The one is inky, the other is ruby. I happened accidentally to pour some of the ruby fluid upon paper, which immediately changed to purple, which must have been by some salts in the paper, &c.; therefore, it is very evident that it is easily altered, and I believe the explanation to be this—that it depends upon the size of the particle; and I believe that we shall find that the ruby gold and silver are very soluble in many salts, which thereby alter the size or form of the particles, and so, I believe, give this colour.

You remember that, if our photographs are taken out of the solution at a certain stage, they become red again, and lose their purple. Now, I believe that that loss of purple is due to a positive action of the gold altering in thickness or thinness, or form or density. It is just possible that you may reduce it to a certain colour, and go on changing it through all the colours of the solar spectrum, until you bring it back to the same colour again. But the proof, perhaps, would require that we should have the density of these various precipitates, have their specific gravity taken in water, in fact, I do hope, at a future meeting, to bring this part of the subject before you with something more than conjecture. At present I think the colour of the deposit or image, depends upon the accelerating or retarding the deposit of metal. Heat may also affect the question. The assayers heat their gold cornets, as they are called, in porcelain crucibles, and, of course, in moving them about, a certain amount of friction is undergone; an almost infinitesimal amount of abrasion of the gold takes place, adhering to the sides of the crucible by which they are purpled. And we know that we can blacken photographs by ironing them, and that even heat alone may cause the molecule to change colour. I may observe, that if we mix the blue and the purple together, we get a brown colour; therefore, if we mix together these three, I think we shall get white light, or something like it. I have already obtained browns, mulberry colours, and lavender from this solution of gold.

I do not think this subject has been previously, perhaps, so fully brought before the minds of photographers; and, however imperfectly I have brought it forward, I trust you will indulge me by believing that I have done my best. I hope now that others will take it up, and I shall be happy if any one will run before me, and occupy my place with more effect.

I omitted to state, but you will at once perceive, that platinum may possibly be placed in the same category as gold and silver; but I have not experimented with platinum.

I have obtained, in one instance, on operating with gold, a deposit which by transmitted light gave the most beautiful blue that can be imagined; and I do hope to see the day when we can get these colours into glass. I have lately been experimenting with Becquerel's so-called sub-chloride of silver, and I got a plate which is capable of taking all the colours of the spectrum. A very minute portion of metal is sufficient to produce a high colour, and I think the colours may be metallic: a little would suffice, for I have shown in the case of iodine in the balance that $\frac{1}{8000}$ of a grain of iodine will give the requisite film used in the daguerreotype. It is found in practice that the chlorine on this Becquerel plate is nearly black, and that any ray will impress its own tint upon it; and white light will also produce white, which is remarkable. I took a rough slightly-coloured print, and found that the apparently white light went through the paper; the lines were represented by black; and I thus had black and white, and I had in addition a rude resemblance of the colours used in the print, as M. Niépce de St. Victor has also found.

I have shown that gold and silver can be variously reeduced by chemical agents; and I do not think it is jumping too far to say that these phenomena of Becquerel's are strictly due to the reduction of the silver. We know that silver rubbed on linen is produced in a black form; and Liebig has shown latterly that if we reduce the silver, by means of milk, sugar, potash, and ammonia, the

silver is thrown down on the surface of the glass. Now this silver is purple by transmitted light, and that is an additional confirmation of what I state—that it may be red or blue, but it is simply metallic silver. Therefore, I say again, that seeing we can have the silver as well as the gold in these colours, we begin to understand the phenomena of Becquerel, and the ordinary phenomena. I must now leave it to your judgment to put together these facts, but I think we have now the whole clue to the matter. *Here*, for instance, is a plate which was rose-coloured originally, and here is a white colour produced upon it by light. That white deposit may afford a starting point for the developer. I believe, for instance, that pyrogallic acid and nitrate silver poured upon this plate would be reduced by that white portion, and not by the other: yielding by the developer a deposit similar to those I produce chemically.

I say, then, that with respect to the photographic image, we assume that no chemical action has taken place because we do not see the result. I maintain that the effect is likely to be the reduction of fine particles of silver, and those particles similar to some of those which constitute the actual image in Becquerel's photochromes in development processes. It is the chemical action superadded to the physical action.

ON INSTANTANIETY IN PHOTOGRAPHY.*

By M. L'Abbe Despratz.

The following are among the most important conditions necessary to success in instantaneous photography:—

Every photographer knows that there are what are called rapid collodions and slow-working collodions. To obtain the first of these is, of course, the primary consideration, as no other photographic agent can be advantageously substituted for it. It has been observed that when ether is in excess, while always imparting to the preparation a great deal of tenacity, it gives, at the same time, a slowness of action which is very undesirable. This, however, is not the case when alcohol is in excess; it is found under such circumstances that, though the collodion may be perhaps less tenacious, it has acquired an increase of sensibility which renders it extremely suitable for the circumstances now under consideration.

This increase of sensibility seems to be the natural result of a greater permeability imparted by the alcohol, through which fewer obstacles are presented to the action of the light, and especially to the action of the sensitising bath and the developer.

It must be admitted that collodions prepared with excess of alcohol more readily undergo change by keeping, especially if the alcohol employed be not absolute; but this is only a slight drawback, which need not be considered, when compared with the advantages to be gained by their use, and which will be amply compensated for by the importance of the object in view.

A second condition, of no less importance than the foregoing, is to have a *good light*. It may be asked, is it not sufficient then to operate in full sunshine? By no means. It is certain, in fact, that there are many days during which the atmosphere, perfectly free from clouds, will be, nevertheless, much less luminous than when clouds occupy a considerable portion of the sky. Hence it arises that a landscape will be especially luminous if, in addition to the direct light of the sun, it receives also an abundance of reflected light from those beautiful white clouds which are sometimes observable.

These two conditions of the atmosphere may seldom occur together, but they do present themselves sometimes, and it is upon these occasions that the photographer should be on the alert. But this is not all. It is not only necessary to secure a good light, but it should be used with as little loss as possible; that is to say, the camera should be furnished with (for stereoscopic purposes) a pair of lenses of short focus and large diameter. It is considered, in fact, best not to use any diaphragm, not even a large one, as it is found that in such a case the loss of light is considerable, and will not admit of instantaniety. In view of these considerations it will be asked, "what becomes of sharpness?" It may be replied: there will be just such an amount of sharpness as may be seen in many of the instantaneous stereograms already published; a little imperfect perhaps, it is true, but still sufficient. It will be such as is obtainable with a whole-plate Voigtlander lens without a stop. For we distinctly affirm that it is only with a lens of such construction (*i.e.* large diameter in proportion to focal length), that instantaniety is attainable, always assuming that we are limited to the use of other known means. It is also well understood that the two lenses should act simultaneously on the same glass, should also be of exactly the same focal length, and be adjusted by means of a rack and pinion movement of the best construction.

There is a third condition, less important, less decisive perhaps, than the two first mentioned; but which, nevertheless, must not be neglected.

We refer to the nitrate of silver bath for sensitising the plates. All baths are not equally sensitive. Old baths slightly aged by use are more sensitive than acid baths. At first, however, it is necessary to procure very pure nitrate of silver, and to this end, the larger and better defined crystals should be selected from a considerable quantity. In this state, the salt is acid, but it may readily be rendered neutral by fusion. This fusion should be effected by the operator himself, in a porcelain capsule, exposed to a gentle heat upon slightly incandescent charcoal, or other suitable means. This operation should not be considered complete until the salt becomes perfectly fluid and a slight darkening takes place in the mass; indeed the action of heat may be pushed so far as to cause the disengagement of red fumes of deutoxide of nitrogen. A bath prepared with nitrate of silver thus obtained will give sometimes a slight general fogging; but, as it is a uniform deposit over the whole surface, it does not detract from the delicacy of the negative, but only makes it a little slower in printing, which cannot be regarded as a serious defect.

* From *Le Moniteur de la Photographie.*

THE COMPOUND ALBUMEN PROCESS.

By Mr. Noton.

[Read at a Meeting of the Manchester Photographic Society, November 6th, 1861.]

The preparation of a sensitive surface of albumen upon a glass plate has now for a long time been considered a difficult operation. Even so recently as in The British Journal of Photography of the 15th of October last the members of the Bradford Photographic Society are advised of "several serious disadvantages attending it"—"that it is not easy to obtain a film of uniform thickness," and that the drying of such film "must occupy several hours," and so on.

In the same journal is a report of our last meeting, which was held the day before Mr. Shadbolt's paper was read at Bradford. Towards the close of that meeting I had the pleasure of showing you three 8¼ by 6½ negatives, and two transparent positives, reduced from two of the negatives to lantern size, all upon double films of albumen, and, in consequence of some of our members expressing a fear about the preparation of plates with iodised albumen, I presumed to offer to work the process out at this meeting, and I hope that I shall obliterate the impression which has been so frequently received.

It is essential to success in coating plates with albumen that the atmosphere of the place in which it is to be done is entirely free from dust or fibres, and naturally damp, with a temperature of 60° Fahr. Such not being the case in this room, I must ask you not to expect that I shall cover the plates free from defects in the presence of those photographic enemies.

The quality of the glass plates must not be overlooked. Plate glass is of course the best, especially where contact with another plate is required; but negatives upon flatted crown will do, either for printing upon paper or reduction in the camera.

A strong solution of soda with whiting will clean them, if new, or not too bad; this may be done the day before they are wanted. Rinse them well under a tap, wipe dry with a photographically clean cloth, brushing the fibres off when the electricity has settled, and put them into a rack, with the face side to the left hand.

The albumen is the next consideration. The fresher the eggs, and if from country hens, the better. Crate eggs, not kept long, will answer pretty well. Darkness, and a low temperature, down to 40° Fahr., is good for albumen either in or out of the shell.

The conversion of the organised mass of albumen to a liquid by beating, or disintegrating as I call it, cannot be too well done, for whatever process it is required, whether plain or salted; and should be prepared about twelve hours before it is to be used, and then filtered.

Pour the albumen upon the dry glass plate as you would collodion, and if it does not flow to your satisfaction make it do so with a quill, a camel-hair pencil, or your finger: you will also have any quantity of another enemy, namely, minute bubbles. Three or four years back I thought if I could but get albumen to flow as easily as collodion I should be set up. I tried steaming, but found it did not answer, as part of the surface of the plate got dry before the albumen reached it. Ultimately I hit upon the idea of mopping the plate over with a strong solution of soda, washing off front and back, and whirling rapidly for about ten seconds; I

then found the albumen flowed as well as collodion. Another great advantage results from this—the plate is made chemically clean at the moment you are going to cover it; there is no risk of contamination from a cloth, nor fibres set afloat in your operating room. Still you must not pour the albumen on as you would collodion: albumen must never drop. The flange of the neck of the bottle must be in contact with the centre of one side of the plate. Tilt the bottle so that a quantity comes out on about the centre of the plate, then incline the latter up and down to spread the albumen. Keep working the liquid round and round, then cross-ways and length-ways of the plate several times to mix with the moisture on it. Pour off into a cup, then whirl, slowly at first, increasing the speed afterwards; detach from the holder and slip the now albumenised plate on to a hot water plate to dry, which will take about a minute. When cool, sensitise and wash thoroughly; if a second coat of albumen is intended to be put upon the first, this sensitising may be done in daylight; from the washing baths transfer it to a bath of iodide of potassium, or chloride of ammonium, then wash well again, fix the plate upon a holder, give it another swill with water from a jug, whirl rapidly, and coat and dry as before.

The plate when cool is ready to be re-sensitised in the dark room, or put away in a plate box without, for keeping.

If, in time, dust or fibres get on the surface of the uncoagulated albumen, it may be washed off, and the first film recoated.

PHOTOGRAPHIC COMPETITION.

Award of Medals at Exhibitions and Elsewhere.

By John Cramb.

Some difference of opinion exists among the friends of photographic progress in regard to the wisdom of awarding medals at our Exhibitions, and the results that have flowed from the attempts yet made have not proved at all encouraging—rather strengthening the hands of those who oppose such awards than being at all calculated to lead societies, or conductors of Exhibitions generally, to adopt the plan of offering prizes for excellence in photographic productions.

This state of things is, however, in no way peculiar to photography. A considerable section of the thinking part of the community opposes all presentation of prizes, medals, or indeed competition of any kind, holding that more harm than good is done by them. And, then, they say in principle the practice is wrong, appealing, as it does, to a base part of our nature.

It would be too large an affair to argue out the whole question now: space would not permit it, and it is, perhaps, undesirable. Sufficient that it is understood and granted that photographic competitions are in exactly the same position as other competitions. It is, perhaps, not in accordance with British prejudices to be given to wearing medals. It may be more characteristic of, and congenial to, our Gallic neighbours. Though there perhaps will come a time when such trappings will be disregarded and discarded; the fact stands out that the tide of popular feeling and general practice has been flowing in the opposite direction. Has not more than one new "order of merit," as the phrase runs, been instituted within the last few years? Instead of disregarding the antiquated and meaningless orders of the "Bath," "Garter," &c., is there not rather a keen interest manifested by the public in them, and loud expressions of indignation heard when the dispensers of these rewards have neglected to consult public opinion in their appropriation? The feeling of the people seems to be—not to abolish, but to reform them; to define their uses; and to decide to whom and for what they are to be given. This is consonant with the true British spirit of progress in everything—to take things as they are and improve them if we can, and as fast as we can; but not to abolish what exists, merely in order that we may make a fresh start, unencumbered by anything relating to the past.

The mere idea of awarding medals is consistent with the spirit of the age: let the manner of doing it be so also. The best men in the photographic world have either given no attention to the subject, or have directly opposed competition for any other purpose than that of doing what is effected for its own sake—not for the mere purpose of obtaining a medal or of securing the commendation of a jury.

The Photographic Society of Scotland was among the first to offer medals for the most excellent pictures at its Exhibitions. There can be no doubt that, besides perhaps a wish to advance our art, the Council of that Society had also in view to make its Exhibitions more attractive. What has been the result? The Exhibitions have been regularly, year by year, more and more unsuccessful, till last year, as some critics said, there was some difficulty in finding a picture worthy of a medal. It was certainly a small, and far from a high-class, Exhibition.

Again: only lately, the Birmingham Photographic Society announced the intention of holding an Exhibition, and proposed awarding medals for certain classes of pictures. Instead of a large collection, fully representing the position of our art, the Committee could not get as much as would make a decent opening till long after the advertised time; and, even after two months' persistent application to the photographic world for contributions, it was a complete failure, both as regards quantity and quality—perhaps the most meagre Exhibition ever opened.

In the case of the Edinburgh Exhibition, it was the past conduct of the Society which produced the defective result, and the Birmingham one in a great measure suffered on that account. There was no intention on the part of any one to act unfairly, or to do aught that could possibly injure the Exhibition, or in any way retard the true progress of photography. The Council of the Photographic Society of Scotland is composed of gentlemen above the suspicion of being guilty of a dishonourable, far less of an unjust, action; but they may have done unwittingly what resulted in an injustice. At the first Exhibition at which they announced that medals would be awarded see how the plan was carried out. Medals were to be awarded! Who was to award them? and for what were they to be awarded? No information was furnished on either point till the pictures were sent in. What! run a race without knowing the course, or where the winning post is? Ultimately the whole society, *unannounced*, acted as the judges! The second year there was no preliminary intimation of how the awards were to be made. Photographers were simply told that their works were to be judged—but were not told by whom—if sent to the Edinburgh Exhibition. By-and-by it oozed out that the Council was not pleased with the previous year's plan of award, and that it proposed going to the other extreme, and only one judge was to be appointed. It was hinted that there was some difficulty in finding any one brave enough to undertake the onerous duty. The selection, however, fell on a highly competent gentleman, Mr. Horatio Ross. But why, if this were to be the plan, did not the Council inform intending exhibitors beforehand? They would then have known what to expect. Photographers, like everybody else, have their likings and dislikings. If, for instance, one gentleman that I could name were to be sole umpire on such an occasion, any intending competitor who knew that he had a monomania against white skies would know also that there would be no use in sending a picture with a white sky, however excellent in every other respect it might be. One man's judgment might possibly be in itself objectionable, but still it would be much better than that of a tribunal the constitution of which is unknown till the Exhibition is opened. The turf has not the purest moral atmosphere. Does any one doubt which horse really won the "Derby" last year? No! The conditions of competition were so definite that, any one aware of them, by using his eyes could satisfy himself. If there had been any doubt, there was an umpire appointed, and before the race was commenced he was known to be competent for his office, and was placed in a known position where he could judge of the result of the race. In photographic competition there has been hitherto nothing definite as a starting point; no looker-on could tell who had won, because the conditions of competition were never sufficiently fixed. It is not asserted that they were purposely left undefined, but were so most probably from the incompetence of the promoters to deal with the question. It is much easier merely to say we will give a medal for the best landscape, than to say so with such additional particulars that any one having the use of his eyes could tell which picture in a collection deserved the medal. What is the object of offering such medals? To aid the progress of our art? If that be the object, then limit the competition as much as possible. Compare similar results. What is required to be rewarded? Is it not transcendant skill in producing a photographic result? Is not every collateral circumstance to be taken into account? Would it not be well, in some cases, even to inquire whether the picture was the result of skill—a plan of working—or the mere result of a happy chance? To test that, would it not often be well rather to require that several pictures of equal merit, or of an aggregate merit, should be sent in? Surely there could be no objection either to mark with approbation the *one* excellent picture, too; but by all means stamp with your approbation the more than mediocre productions of the artist who, though he shows no transcendant picture, shows twenty which are

all but the very best. It may be sometimes desirable to encourage experiments in a particular direction, though the finished results may be far from comparable with those produced by other means. Consequently I say that if true progress be the object of granting medals, then in such cases medals should be given for results by a particular manner of production, though these may be excelled by other features, obtained by other means. The objection to this plan of *recognising* merit in so many productions is, that there would be so many medals to give that it would be expensive; and, again, that medals would become so common, that nobody would care to possess them. Why, if medals be only as *common* as *merit*, should any one object to their possession or be *un*desirous of obtaining them? But they should only be given for transcendant merit. Well, let it be so. Is there any fair comparison between the particular ability shown in producing an instantaneous stereograph and the production of a 20-inch landscape or reproduction? There is merit in both, and it *can be measured*, and the award made to the artist whose *results* stand highest in the estimation of the umpire. There is *merit* in producing a roll of butter or making a wheelbarrow, *and it can be measured;* but would any one propose to enter wheelbarrows and sweet butter in competition *along with* photographs? If medals are to be the reward of merit, let them by all means be so, as honestly and intelligibly as possible. Floral competitions are good examples. See how the boundary of competition is narrowed there! In one case a society is formed in Scotland for promoting the cultivation of one particular flower—the pansy. Into how many sections is their prize list divided! The real competition is so narrowed that in most cases anybody could make the awards. Any photographic society proposing to offer medals or other recognitions of merit would do well to consult the prize list of some floral and horticultural exhibition, as furnishing a plan of competition that has in an eminent degree been successful in accomplishing the object in view. Let them arrange first, *what they want to encourage*, and then offer rewards for *that* in *every form* in which it may be shown in photography.

Independent altogether of the offering of medals, there would come much good out of an officially-recognised critique on an Exhibition coming from a known person or from a body of competent judges. What is the real purpose of sending our productions to Exhibitions? To show what so and so has done. And does any one imagine for a moment that those who send pictures to Exhibitions do not anxiously desire to know what is thought of them by their brethren, by the public, and by competent judges? How has it been hitherto? Critiques have been written by editors, sheltered behind the editorial "we," or, worse still, by anonymous correspondents of photographic and other publications, the worst of all being those written by gentlemen of the quill, who have been crammed for the occasion by some *official* connected with the Exhibition, or by some *officious* friend who is anxious to have his pet artist bepraised, or, more sordid still, wishes to help in filling the pocket of some professional photographer. What journalist would be stupid enough to give his *opinion* of the merits of a floral exhibition after *three honest, competent* men of acknowledged ability had given a decision? The *non-competing* part of such an Exhibition is the only part on which a reporter or sub-editor would dare to try his hand—the only part on which they *do* so. Let us have an official declaration of the merits of the productions at our photographic exhibitions, and there is an end of the prattling twaddle of anonymous critics, who at present annoy sensitive artists, and disgust honest impartial men.

Photographic competition, carried to the fullest extent, would not be unlike a rifle competition. An object to be photographed could be chosen and a time fixed for the operation: there should be certain restrictions in regard to the number of trials to be allowed, and the time occupied in such trials, and a proper measuring of the results obtained. This would be a complete trial of ability. But in photography it is the result we care for, and it is in a great measure a matter of no consequence how that is obtained. So most people think. An artist may fix his residence near a particular view, and try it every day for three months, as a successful Scotch photographer has done, and his result is fairly compared by the public with that obtained by a dry-plate man, who was not ten minutes on the spot. As far as pleasing the public and obtaining its patronage is concerned, it is a matter of choice with the artist which plan is adopted. And if excellence of result be alone what photographic societies would care to encourage, then there is no need for any other competition than one of results. If, again, societies desire to mark with their approbation the power of producing good pictures *rapidly* and certainly, then it might be open for consideration if something of the rifle competition kind of trial before indicated might not be worthy of consideration.

Whatever be done let there be no more competitions announced without publishing the terms of competition, and, above all, announcing who are to be the judges. And it might be well to require that exhibitors should *enter* for a particular prize or medal certain pictures. It would be worthy of consideration if the best *twelve* portraits, within a certain size, would not more fairly test the ability of exhibitors than simply the best *one*. The best single picture may be rewarded, but the best *six*, or *twelve*, or *eighteen*, should not be unnoticed. It would be easy, from these hints, to form an exhibition prize schedule which would be at once reasonable and equitable, and which would draw a host of exhibitors, instead of, as at present, frightening nearly all good men away.

If something like the principle which is merely hinted at here were to be adopted in connexion with our Exhibitions, there would remain much to be done both in drawing up accurate conditions of competition, and also much to do in establishing what are the qualities of good pictures of this and that kind; but in every case a nearer approach to justice and general satisfaction would be obtained than at present.

ON THE RESINISED COLLODION DRY PROCESS.*

By Saunders Van Loo, of Amsterdam.

Every photographer who has, from time to time, operated with dry collodion must have arrived at the conclusion that the question of the best method is not an easy one to settle. A number of receipts have been recommended in turn, which always produce some result; however, frequently it is not the desired result.

Amongst the better methods those of Messrs Robiquet and Dubosq, may, without doubt, be reckoned; the older processes with the hygroscopic agents having lost almost all credit.

A modification or rather simplification of the process with amber we find in the use of common resin, recommended by M. l'Abbé Despratz.

The method is excellent; and it was this process which I intended to follow when I occupied myself, some months ago, with a research for a means of using dry collodion.

Once at the work I soon saw that the method in question gives rapid and satisfactory results, provided always that the combination of the ingredients of the collodion did not oppose themselves to the formation of a perfectly developed impression, without having the fear of seeing the entire plate become foggy.

Sometimes, however, by chance, the composition of the collodion is quite suited for the proposed end, and then the sole addition of some resin suffices. I asked myself whether it would not be possible to fix the conditions of success in every case—that is to say, to prepare to a certainty dry collodion with the view of rendering the method of M. Despratz more general; and, after an infinity of trials, I was fortunate enough to arrive at a solution of my problem. I will give the description of the modifications of the wet collodion which seem to me useful to employ in the process, when the use of it in a dry condition is intended—modifications which consist only in the changed proportions of the ingredients which enter into photographic collodion.

Although we already encounter difficulties enough in general, in the practice of photography with the wet process, the processes with dry collodion require still more minute care.

To state precisely my ideas, I will give an example: Every one knows that there are two ways of obtaining on collodion a film of iodide of silver of a thickness and opacity convenient for the moist photographic manipulations. No inconvenience arises if the proportions of the iodides and of the gun cotton vary a little. It is understood that in the moist process a slight surplus of pyroxyline admits of a rather smaller proportion of iodide: in the same way, too large a quantity of the last ingredient requires less gun-cotton. In a word, with wet collodion we can always obtain films of a proper density and opacity, but with dry collodion it is quite otherwise. Numerous trials have taught me:—

1st, That there is a great difference between the two cases mentioned above.

2ndly, That the collodion exclusively applicable to the dry process with resin, requires a composition of collodion which contains a great deal of iodide and little gun-cotton. That is the whole secret of the composition of dry collodion with the resin which ensures certain results. However it is not always very easy to accomplish this; it is often necessary to overcome difficulties

* From *Cosmos*.

which arise from the proportions having been too much varied. If the proportion of iodide be too great, that of the gun-cotton may become too small. In that case a powdery film is not in a condition to contain all the iodide of silver on leaving the sensitive bath. It is especially in pouring the cyanide over the plate that the greatest part of the particles of reduced silver is cleared away by the flow of water employed to remove the fixing solution: the entire impression goes whilst the film of collodion itself remains adherent. It is easy to obviate this inconvenience, for in this collodion there is only a little gun-cotton deficient; thus, in adding to it a little of the normal collodion and taking a new proof plate, we shall see that the impression can bear the washing current, after having been fixed, however little the silver bath may be in a state fit for use. Care should be taken to avoid too great an addition of the normal collodion, for a film which is too opaque from an excess of pyroxyline always produces foggy impressions, notwithstanding the addition of resin.

We have already observed that chance may furnish us with a collodion requiring only the addition of a small portion of resin in order to produce impressions without fogginess.

Now I will give a summary of the practice of the method which has always succeeded with me. The collodion should contain—

Not too much ether (about 50 per cent.),

A great deal of alcohol,

A great deal of iodide (iodide of cadmium and iodide of ammonium),

Very little pyroxyline,

About five grains to the ounce of common resin.

A little water added to the collodion, or alcohol containing water, is found to improve its condition; it should, however, be used cautiously.

It may be asked if it is not possible to give quantities in this receipt. I reply that the required quantities will be found after a few trials; and more, that all the experiments with dry collodion require some familiarity with photographic phenomena—therefore it is impossible to give exact formulæ. One collodion will require one per cent. of pyroxyline, another double the quantity—the same proportion of two different kinds of gun-cotton rarely giving the same consistency to the collodion.

The amount of resin varies between five and ten grains to the ounce. However, I intend to make the quantitative analysis of the dry collodion, in order to find by analysis that which would be always very difficult to acquire from synthesis.

As to the silver bath I have already said that the strength of nitrate of silver is of importance: with a bath too weak the impression goes in washing the film, even if the collodion contains the right proportion of iodide and pyroxyline. Thirty-five grains to the ounce of water in the bath seems to me the best proportion: then the addition of a few drops of acetic acid ensures the transparency of the bath, which will otherwise become blackened in a few days.

Removed from the silver bath, the plate is plunged into undistilled water (in Holland rain water is preferred); the soaking must be repeated in a second bath; afterwards the plate is put to dry in a dark place.

One of the advantages of this method is, doubtless, the sensitiveness of the films; thus the time of exposure is much shorter than usual—that is to say, than when we use dry collodion with dextrine, gelatine, or tannin.

The time of exposure to the light varies accordingly as the quality of the collodion is more or less sensitive. The one which I am using at present requires thirty seconds in the sun, with a double combination lens and diaphragm; whilst the single object-glass for landscapes, with a diaphragm (of about four-tenths of an inch), requires one minute. Thus we see that the sensitiveness of the plates is sufficient. I have also made some researches upon the keeping property of the sensitive plates, so as to assure myself that they do not lose their good qualities. After nine days they still yielded impressions quite equal to those prepared the day before. When we use the same collodion for the common wet process the time of exposure is the same; but the impression is often rather weak. We see, then, that my collodion by itself is not very sensitive, and perhaps we could accelerate the dry process by choosing a collodion which gives the negative impression much quicker; but I have not yet tried it. After the exposure of the dry plate we can develop the impression at our convenience—that is to say, we can do it directly, or by-and-by: if kept, we cannot succeed without having recourse to nitrate of silver. It is necessary to plunge the plate again into the sensitive bath, and let it remain there until the last bubble of adherent air has disappeared from the sensitive film. By blowing from time to time upon the wet film it will succeed better. The impression is then developed by the ordinary pyrogallic acid; this bath, however, must not be too strong. M. l'Abbé Despratz has recommended developing the impression by plunging the whole plate into a bath containing the developer, in order to avoid a spot upon it where the pyrogallic solution has been poured. The impression will immediately appear and develop itself more and more. When the proper strength is attained the development is arrested by washing it in common water: then it is fixed with cyanide. When it is certain that all the iodide of silver is dissolved (the wrong side of the plate must be examined), it must be well washed in water; then, after drying, the proof must be varnished.

These are the whole of the manipulations of a method which must infallibly lead to the desired result. It is very astonishing that the resin process is not put more frequently into use—perhaps for the reason that there are some difficulties in finding the proper proportions, as we have seen above. If this article contribute in any way to facilitate the practice of this process I shall congratulate myself on having published it.

"A DREAM OF THE FUTURE."

Scene 1. Entrance to International Exhibition, Hyde Park. Time, May 5th, 1862. Hour, 11 A.M.

[*Enter Frenchman and Franco-Italian in picturesque costume.*]

Frenchman.—I vant un—vat you call it?—un cat-loag.

Attendant.—Catalogue—yes, Monsieur. We have two Catalogues, which do you require: the Fine Arts Catalogue or the Mechanical and Industrial one?

Frenchman.—Oui, yes, de industrial, mechanical, engineering—Anglais great in machine. Pictures—ve have more dan enough at home.

[Frenchman and Italian each pay their shilling, and opening the catalogue indiscriminately, walk away cutting the leaves.]

An interval of five minutes.

Frenchman and Franco-Italian return breathless with haste.

Both.—Monsieur! Monsieur! you have given us wrong cat-loag. Oui, oui! see, see!—[Reads excitedly, *On the Derwent, The Meeting of the Waters, Lyndale, The Valley of Desolation, Bolton Park, The Pass of Killiecrankie, The Rising Mist, Early Spring, Fingal's Cave, Top o'the Hill,* dese are pictures.]

Attendant.—No, Monsieur. The catalogue is the one you asked for: those are all the produce of machinery!

Franco-Italian (jocosely)—Machinery!!! You call men's brains machinery. Ugh! ugh! Great nation! Great peoples! Great nation! Vive l'Angleterre!!

Frenchman (wily, sarcastically).—Oh! you put some of one cat-loag into de oder, and some of de oder into dat one, so peoples must buy both—two "one shillings." Ugh! Un grande nation! Un grande nation of—of—of shopkeepares!!

[Exit Frenchman and Franco-Italian, shrugging their shoulders.]

S. T.

LEAVES FROM THE DIARY OF A LATE ENTHUSIASTIC AMATEUR.

Edited by Sydney Sunshine.

What universally interesting subjects are the old mouldering ruins of those whilome stately piles which lie crumbling in the shady sadness of some of England's greenest vales—and our fatherland has many such! How impressive is their desolate grandeur! How suggestive of the mutability of all earthly things! What lessons of humility may they not be made to yield as we contemplate the "cloud-capt" towers of former ages, now reduced to mere huge fragments,

"On which dull Time
Feeds like slow fire upon a hoary brand!"

The picturesque beauty of the localities amidst which many of them are situate invests them with additional interest. Often, far removed from places easy of access, they lie reposing in mournful beauty beneath the shadow of the cold dank wing of oblivion, unheeded, and almost forgotten, save in the pages of antiquarian lore. The distant hum of busy cities never reaches such recesses. No sounds, save those of Nature's symphonies, ever disturb the impressive solitude. Her evening vesper and her morning hymn ascends each day unblent with other sounds of aught more harsh, more turbulent, or less pure. The wave of time rolls on noiseless and unrecorded. It might seem that Silence there had pitched his

tent, and reigned in undisturbed possession. To the weary man—tired of the world and the world's ways—who can turn lovingly to Nature, or, heart-sick of strife and wrong and blatant falsehood, finds refuge in everlasting Art. There are quiet, healing influences shed around such nooks which nothing else mundane can supply—with just, and only just, enough of "the still sad music of humanity" as may serve to chasten and subdue. Freedom is here, and beauty and peace—here, among the solitary vales and boundless hills. And when the day is done and the glory has died out of the crimson west, the dim dusky hues of twilight flit past, and the stars come out and look down on scenes of tranquil, unutterable beauty.

The land is rich in remains of other days. Tintern—beautiful Tintern!—Morpeth Tower, and Rievaulx Choir, and Kirkstall Crypt, and Chepstow with arrowy light streaming through traceried windows "richly dight." Then there are the beautiful abbeys by "Tweed's fair stream." The exquisite finish and grace of Melrose—hallowed by the genius of Scott—like nothing else

> ———than frozen music or a poem in stone.
> Rich in broken arch, shafted oriel, and foliaged tracery—
> Never another scene so sad, so fair.

Dryburgh, rising in scattered broken masses from the rich shrubbery, and towering up free and far above the surrounding foliage.

> "Few moulder there but those, the loved, the good,
> The honoured, and the famed; and sweet flowers smile
> Around the precints of the Abbeyhood."

And Lindisfarne—and Fountain's—and last and sweetest of all, Raglan, in utter solitude amidst the wild wood of its own *pleasaunce*, the towers rounded with ivy, the forest roots choked up with undergrowth, and the brook languid amidst lilies and sedges: legends of grey knights and enchanted ladies keeping the woodman's children away after nightfall. It is to the religious art of the middle ages we principally owe them. When the old Greek art revived once more in modern Europe, though at first it seemed to add richness and grace to this peculiar development, it smothered and killed it at last, as some beautiful tropical parasite exhausts the life of the tree it seemed at first to adorn. Poets and painters have loved to depict them in all time—have limned them in every possible aspect, at morn, and drowsy noon, and when upon turret and tower the day-god casts the homage of his parting glittering beams; and now we have them limned by the sun's own subtle alchemy.

Different in kind, but scarcely less beautiful in degree, is sunrise amidst such subjects, affording some beautiful effects when sufficiently clear and unobscured:—The waning moon—the pale grey dawn (if in the lake district, chill and misty, with scrolls of steaming vapours rolling up the hill-sides)—the first faint streak of light in the east—then another, and another, until the mountain-tops are tipped with gold, and the black shadows melt away all around under the influence of diffused light—then the first small arc of the sun himself appearing above the horizon, coming forth from his chamber in the east, "rejoicing as a strong man to run a race." One heave more and—no! a bank of cloud interposes; another heave and it is "topped," the earth flooded with sunshine, and Nature busy making pictures everywhere.

There is little fear of æsthetic studies getting too much attention. The age is far too busy and material for that. But the photographer who would foster within himself the artist-growth should *saturate* his mind with such scenes as these. By the law of affinity he accumulates what is beautiful, and his mind becomes assimilated thereunto, and is a welcome habitation for all that is lovely in nature and art. If an artist's life is to be envied, it is often only for the capacity of subtle, refined emotions, such as these, wherewith minds of a grosser frame are not permitted to intermeddle. He is chosen for Nature's playmate, and shares the bounties which are showered upon the lilies of the field. He must not care to accumulate a golden muck-heap if he would develop the highest faculties of his nature—not excluding the idea of Providence or provision, but wholly that of accumulation—and cultivate "a heart full of sensitiveness to all elements of costless and kind pleasure—therefore, chiefly to the loveliness of the natural world." There is a beautiful German poem in which the poet is wisely depicted as coming too late to share in the division of the world, and the gods, in compensation, make him a denizen of the heavens. No poor inheritance sings Mrs. Browning in *Aurora Leigh*:—

> "Earth 's crammed with Heaven,
> And every common bush afire with God.
> But only he who sees takes off his shoes:
> The rest sit round it, and pluck blackberries,
> And daub their natural faces unaware,
> More and more from their first similitude."

The poet and the artist have much in common—the same temperament, the same keen sense of the flowers and the thorns—and often, each

> "In a golden clime was born
> With golden stars above. Dowered with the hate of hate,
> The scorn of scorn, the love of love."

"What are you in *search* of?" Turner used to say to art-students, knowing well that only passionate seeking led to passionate finding. "Better pursue a frivolous trade by serious means," says another, "than art frivolously."

It is no small thing to be able to feel intensely the inimitable grace of the Venus de Medicis—the proud defiance of the Apollo Belvidere—the anguish of the Laocöon—and the pathos of the dying Gaul. But photography has done more for the art-education of the masses in ten years than the renowned statues of the Capitol and the Vatican in centuries. Such things are but as though they were not to the majority. Yet even these photography has made familiar as "household words."

But the future of photography is not that of a mere copyist. It will go from strength to strength. Let only its disciples keep pace with its capabilities. Art is a sacred service, and will not be trifled with. I would have all enter it, and take a first lesson of Dame Nature. They will find much that is charming: hunting up pretty bits in sequestered spots and glens, "down where the blue-bells grow," far away from the seats of commerce and conventionality. Go sojourn for a season in a cottage on some Cambrian wild; and, while realising the boundless sense of freedom, take the advice contained in *Eöthen*, and do think of the poor devils who dwell in streets and squares and houses in a state of utter respectability—"presenting compliments," and "much regretting," and such-like elegant trifling. Think of them, and thank Providence for your privileges.

RECENT PUBLICATIONS.

Series of Cabinet-sized Photographs, taken by S. Thompson,

Including the *Waverly Photographs*, *Places of Historical Interest in England and Scotland*, *Reproductions*, *&c.*

[London: A. W. Bennett, 5, Bishopsgate Without.]

What is a cabinet-sized picture? We fear that it would be difficult to obtain a more direct reply to this question than that given by the cautious witness when under cross examination relative to the size of an article that had been stolen—the nearest definition that he could be brought to state being "that it was about *the size of a lump of chalk*." However, if the specimens before us be cabinet-sized pictures (and we are not disposed to dispute the assertion) they measure from about eight and a-half inches by six and a-half, to ten by eight inches. We presume that the term is intended to convey the idea of convenience for handling and fitness for close inspection, which these specimens do undoubtedly possess. It may be a mere fancy on our part, but we certainly do prefer photographs of the dimensions quoted to those of a larger size, which always appear to us cumbersome and inconvenient. As a rule, large photographs are both too large and not large enough: too large for the folio—not large enough for mural decoration.

Mr. Thompson is evidently a disciple of the same school as Mr. Bedford, than whom no better model can be selected. Not that we mean to insinuate that he is a servile copyist of this gentleman's style, but that he belongs to the same class.

The Waverly Photographs comprise scenes in the home—Abbotsford; the favourite haunt—Melrose; and the last resting-place—Dryburgh—of Sir Walter Scott; scenes that are familiar to most photographic connoisseurs, and that have been rendered by many operators, professionals as well as amateurs. Amongst these before us, that representing the South Side of Melrose Abbey is certainly one of the finest, whether we regard delicacy of manipulation or picturesqueness of effect. The point of view whence this beautiful ruin is delineated is well chosen, the light falling obliquely, so as to give the full rich architectural details of the fine south window, enhanced by the transparent shadows cast by the projecting mouldings. The various tones of this picture are exceedingly harmonious and pleasing, the only fault of the production being an absence of sufficient sky-room above the building.

The printing of this specimen, as indeed of the whole of the series, is highly commendable.

The South Door of Melrose Abbey is a beautiful study (more than the others approaching to Bedford's productions), and admirably executed.

The East Side we do not admire so much, though equally perfect as far as manipulative skill is concerned, in consequence of its having been taken too full-face, to borrow a phrase from the portrait-room.

The East Window possesses much value as an architectural illustration, and is, withal, a very pleasing subject: it, however, in our opinion, suffers materially in consequence of distortion of the perpendicular lines at the margin of the picture, produced, most probably, from turning the camera upwards in order to include the whole of the subject. This we regret to notice also in some others of the series, especially those in which the height of the picture exceeds the breadth. In all probability it was not possible for the artist to get sufficiently far away from his subject to avoid this annoyance, as he has evidently too much artistic skill to submit to such a defect, unless he were reduced to the choice known as "Hobson's"—that or none.

For richness and brilliancy of effect, combined with exquisite softness, The West Front of Melrose Abbey perhaps surpasses the whole. Shadows the most intense, yet clear and transparent, with every gradation of tone up to perfect white, may be found in this specimen, each one in the proper place, giving an excellent illustration of the value of subordination, so well descanted upon recently in these columns by our contributor, Mr. A. H. Wall.

The general view of Melrose Abbey was taken when the sun was obscured; and, though a perfect record of the external form of the edifice, it lacks the spirit of the place from a total absence of shadow, and is consequently somewhat flat.

Dryburgh Abbey has little to recommend it beyond its historical associations: such as it is, however, it has found an able delineator in Mr. Thompson; and Sir Walter Scott's Tomb therein, though in itself a commonplace affair enough, has, by the skill of the artist, been converted into quite a poetic study. The arch of the cloister under which the tomb is situated has been taken from a spot whence it can only be seen through another nearer archway and the openings between some yew-trees, which with ivy and brushwood form, as it were, a rustic framework, the value of which is still further enhanced by vignetting. This is sure to be a popular specimen.

Space will not permit us to do more than mention some of the more striking of the subjects belonging to the other series, amongst which we find

The Statue of Newton, by Munro, recently placed in the new Museum, at Oxford.

The Quadrangle of Brazennose College.

A Portion of the Garden Front of St. John's College. This is highly picturesque; and owing to an excessive obliquity of the sunlight, the shadows, oddly projected, impart to it a curious though charming grotesqueness.

The Entrance to the Hall and Chapel of Oriel College would have been a delightful picture but for the bending inwards of the marginal lines.

The Martyr's Memorial, at Oxford, is rendered effective by vignetting; and the same judicious treatment has been adopted with several of the less ornamental halls and colleges at Oxford.

But, of all the Oxford illustrations, that which will most likely be preferred is The Cloister Tower of St. Mary Magdalene's College. Though rather prim, and with a horizontal line nearly cutting the picture in two parts, there is something uncommonly taking about this subject, albeit deservedly open to adverse criticism on account of sins against several of the rules of art. The photography is pretty well perfect; and the graceful festoons of the ivy in contrast with the architectural lines of the arches curved in an opposite direction, combine to seduce the approval of the beholder in spite of the artistic defects already alluded to.

There are two views of the garden front of Knole House, Sevenoaks, Kent, that recall pleasant recollections of a ramble therein, and still more pleasant memories of the cool shade under the glorious old beech-trees in Knole Park. What a pity they are not included in the series!

Hadlow Castle, Kent, is a pleasing subject, and well treated.

Before concluding we must not omit to mention a number of reproductions of engravings, &c., including *Happy as a King*, "*Let him that is without sin first cast a stone at her*," *Musiciens Ambulous*, &c. These are all perfectly and brilliantly reproduced, which is all that lies in our province to state: to criticise the subjects would be to go beyond it, as their merit has nothing to do with the photography.

The printing and general getting up of the whole are of the best possible character.

Exhibitions.

On Saturday, the 9th instant, a collection of nearly a hundred specimens of "Pictures in Enamel Colours Burnt in on Glass, from Photographs, Drawings, and Engravings," was exhibited to a very numerous though select circle of photographers and other art-amateurs by M. Joubert, at his residence, 36, Porchester Terrace, Bayswater (London). It is well known that the basis of each picture operated upon by M. Joubert, whether the original be an engraving or otherwise, is transferred to his glass plate by a photographic process. This is afterwards burnt in to the glass itself, and remains indelibly fixed as a subject in monochrome; or it is subsequently painted upon by hand with enamel colours, the plate having to be "fired" after the application of each different tint.

Although we have before given some particulars of M. Joubert's process, the following extract from his patent specification may be acceptable to many of our readers:—

"This invention has for its object improvements in reproducing photographic and other pictures, engravings, prints, devices, and designs on the surface of glass, ceramic, and other substances requiring to be fired, to fix the same thereon.

"For this purpose, I proceed in the following way:—A piece of glass, which may be crown or flatted glass, being selected as free from defect as possible, is firstly well cleaned, and held horizontally while a certain liquid is poured on it. This liquid is composed of a saturated solution of bichromate of ammonia in the proportion of five parts, honey and albumen three parts of each, well mixed together, and thinned with from twenty to thirty parts of distilled water, the whole carefully filtered before using it. The preparation of the solution, and the mixing up with other ingredients, should be conducted in a room from which light is partially excluded, or under yellow light, the same as in photographic operating-rooms, so that the sensitiveness of the solution may not be diminished or destroyed.

"In order to obtain a perfect transfer of the image to be reproduced, the piece of glass coated with the solution, which has been properly dried by means of a gas-stove (this will only occupy a few minutes) is placed, face downwards, on the subject to be copied in an ordinary pressure-frame, such as is used for printing photographs.

"The subject must be a positive picture on glass, or else on paper rendered transparent by waxing or other mode; and an exposure to the light will, in a few seconds, according to the state of the weather, show, on removing the coated glass from the pressure-frame, a faintly indicated picture, in a negative condition. To bring it out, an enamel colour, in a very finely divided powder, is gently rubbed over with a soft brush until the whole compositon or subject appears in a perfect positive form. It is then fixed by alcohol in which a small quantity of acid, either nitric or acetic, has been mixed, poured over the whole surface and drained off at one corner.

"When the alcohol has completely evaporated, which will generally be the case in a very short time, the glass is quietly immersed, horizontally, in a large pan of clean water, and left until the chromic solution has dissolved off, and nothing remains besides the enamel colour on the glass; it is then allowed to dry by itself near a heated stove, and when dry is ready to be placed in the kiln for firing.

"It may be stated that enamel of any colour can be used, and that by careful registering a variety of colours can be printed one after the other, so as to obtain a perfect imitation of a picture; also that borders of any description can be subsequently added, such as those shown in the specimens on the table, without any liability to remove or even diminish the intensity of the colour in the first firing."

A further step in advance is the occasion of the present Exhibition, the application of colour to the photograph being now effected with more certainty and facility than has been the case hitherto. The process appears well calculated for the purpose of house decoration, at moderate cost, by providing a good substitute for painted windows, including subjects far more minute in detail and artistic in treatment than could be ordinarily obtained by manual dexterity. That there is much to be yet accomplished before the art can be considered as having arrived at maturity, it would be folly to deny; but its entire practicability and commercial success is now beyond a doubt.

We may now make a few remarks upon the specimens exhibited, many of which are surrounded by, or rather placed in the centre of, borders of a damask-like character, formed by ground and transparent glass intermixed, with a clear medallion-shaped space left for M. Joubert's operations. Copies of engravings and lined drawings in monochrome leave nothing to be desired. A copy of *Sampson and the Lion*, reduced by photography, is an excellent example of what can be done in that direction; and what is perhaps still more satisfactory is a copy of *The Irish Lovers*, taken by direct application of the paper engraving to the sensitive surface on the glass. These are both sharp, clear, distinct, and perfect as can be wished for.

The monochrome copies of photographs are many of them somewhat deficient in the more delicate half-tones; but there is indisputable evidence that this is due, when it occurs, rather to some deficiency in the original or in the photographic part of the

manipulations than essentially to the process. *A Garden Wall*, from nature, the subject being really a study of leaves—*A Faun Dancing*, being a photograph from the marble—and *Savoyards*, one from nature—are illustrations of photography proper thus applied.

With regard to the coloured specimens, the first impression which we received on entering the studio was that of the existence of too much brilliancy, that gave somewhat the meretricious appearance of coloured lithographs. This, however, is a defect which no doubt will be corrected as the art advances, as well as that of an amount of coarseness in the foliage of some of the landscapes due to the touch of the artist, which contrasts unpleasantly with the delicacy of the photographs. In some specimens, instead of attempting to paint over the subject, the artist has in our opinion much more judiciously washed in a tint, leaving the photograph itself to produce the variations of tone required; and this is the case with the most satisfactory of all the coloured specimens, viz., *Wortley Hall, Lancashire* (from nature), wherein the foliage is but little interfered with, and atmospheric effects are fairly given. Next in order of excellence we consider a *Scene near Dundee*, and a *Scene on the Thames*—we mean, of course, as illustrations of the polychromatic process. It is but right to remark that the application of many colours presents difficulties in addition to those dependent on the "firing" of the plate after each application, because not only is the colour applied quite different in tint to that which it assumes after passing through the kiln, but the application of one colour over another sometimes brings about very unexpected results.

There is one direction in which we think it is premature to employ M. Joubert's patent, until greater progress has been made—we mean that of portraiture—an unpleasant grotesqueness of aspect being generally imparted to the victims whose "counterfeit presentments" have undergone the operation of an *auto da fé*. There are two small specimens upon white enamelled glass that are exceptions; but even these lack brilliancy.

Some of the smaller subjects have been adapted to the adornment of transparent lamp-shades with very good effect, and, no doubt, they would answer well also for hall lamps.

We have little doubt that rapid strides will soon be made towards perfecting this very useful invention. Already M. Joubert has more orders than he can well supply, and a little extra pressure put upon that gentleman will compel him, in spite of himself, to exercise anew his inventive faculties, in order to meet the demand, which will assuredly increase.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

HARMONY—POETRY, MUSIC, AND PAINTING HAVE ONE COMMON SOURCE OF EXCELLENCE—TRUTHFULNESS THE SOURCE OF HARMONY IN LIGHT AND SHADE—HARMONY OF EXPRESSION OR SENTIMENT—ILLUSTRATIONS TO SHOW THE VALUE OF HARMONY—HARMONIOUS AND INHARMONIOUS CONTRASTS—ILLUSTRATION FROM THOMSON'S "SEASONS."

"The mind should be satisfied that it, the picture, is a complete harmonious whole, and not a collection of parts or motives put together at random, or without enquiry into their relative fitness, so as to jar upon sensitive tastes."—*J. J. Jarves.*

"In the composition of a picture, the painter is to take care that nothing enters into it which is not proper or convenient to the subject, as the poet rejects all incidents which are foreign to his poem, and are naturally no part of it. * * * No person, no incident in the piece or in the play, but must be of use to carry on the main design."—*Dryden.*

"Beauty is music, too, tho' in disguise;
Too fine to touch the ear, it strikes the eyes,
And thro'em to the Soul the silent stroke conveys."—*Ibid.*

"The Highest Art is the imitation of the Finest Nature."—*Hazlitt.*

MY DEAR FELLOW-STUDENT,

Following out subordination in my last, we were led to the consideration of harmony as one of its chief results; and, that we may avoid repetition of matter now fresh in your memory, I shall devote my present communication to the further consideration of the latter, as a picture's all important quality.

Harmony is the result of a complete unity of parts: all the artist's teachings tend to it, and it governs every branch of art in all their various details and qualities. It is its province to keep all the component portions right in degree and in place, so that, while order and repose may exist without sameness, contrast and variety may not degenerate into discord and disunion.

In "the very tempest, torrent, and whirlwind of passion," it 'begets a temperance that may give it smoothness," and, like the calm serenity of conscious power, frequently affects our instincts rather than our vision—is felt rather than seen.

The pictures of imitative art are like "the pictures of thoughts," as Dryden called words: we may use them for the careless expression of that which is vulgar and commonplace; or, by the studious choice and arrangement of a wise head and refined taste, we may so dispose them that—

"All the parts and words their places take,
And with just marches, verse and music make."—*Cowley.*

From outlines and the tones of the *chiaroscuro*, upwards to the sentiment and expression, all the parts in a picture are like words in language and notes in music, which have their great value, not in themselves, but in their combinations. Thus the beauty and harmonious sweetness of genuine artistic productions in Painting, Poetry, and Music, have—as I endeavoured to show you in my last—one common origin; and we, photographers, who would fain emulate the high excellences of a fine art, cannot, of course, afford to overlook so important an element of study as that to which my present epistle is devoted.

In my last communication we saw why the accessories must be in keeping one with another, and that advancing or receding parts, whether by virtue of their apparent actual nearness or remoteness, or by that of their degrees of prominence as points of attraction, must be subordinated to the chief aim or intention of the artist. We must also remember that all the lights in the picture must, by their relative degrees of intensity, indicate that they have but one source of illumination, and that all the shades or shadows should be in accordance with each other and with the character of the light; in short, that the perfection of harmony is only secured by the complete agreement of all the parts in the Unity, Character, Expression, Sentiment, and Purpose of the whole.

The great source of harmony in light and shade is simply *perfect truthfulness*. Other harmonious effects may result from the selection of the point of view, character, and degree of illumination, time of year, &c., in reference to the natural landscape; or to the choice of process, chemical conditions, exposure in camera, or manipulatory skill in reference to the production itself; but the great harmonies of light are vouchsafed only to the faithful imitator—the true disciple. But, as I observed in a previous letter, we do not all alike recognise these truths.

The photographer, whose uneducated eye has not learnt to catch the subtle and tender refinements of tone and tint in art or nature, thinks when he has secured perfect detail and gradation from light to shade in his productions, that he must necessarily have got all excepting colour which nature can give his pictures, and that if harmony does not exist therein it is a very good proof that such a quality is peculiar to art and does not belong to nature. But let him examine his works with a more jealous and critical eye, and he will soon see that all his photographs, although equally perfect in their more easily recognized qualities of focus, exposure, and development, being taken under various conditions of illumination, have yet lights of the same intensity, and shadows of precisely or very nearly the same degree of depth. Now this should prove that such productions are untrue to nature, and that at least the greater part of them must be "out of harmony." For, as in nature, the lights were varied, they must have changed in each negative, both with the character of the light itself and with reference to their shades or shadows: for instance, the stronger the sunlight the greater and more perceptible must its diffusion be, and, consequently, the more transparent are the shadows, while on a grey, dull, cloudy day, when the light is weak, its diffusion being less in proportion to its strength, the shadows are more sombre. We sometimes call the weak a diffused light, because of the absence of direct light, not because it has a greater degree of diffusion, which must always be in proportion to its power or strength. More will be said of this under the head of "Tone." Now, when we visit our photographic exhibitions, and see this gentleman's productions recognised by the *uniformly* "vigorous character of their light and shade," and this other gentleman's by the *uniformly* tender and delicate character of their ditto, ditto—when one revels in plenty of the deepest black and the purest white, and the other displays less powerful contrast—it is certain that inasmuch as they are both *always* "vigorous," or always "tender and delicate," they must both be very nearly always out of harmony and truth. Watch the changeful lights and shadows of a fine April day, when their variations are most marked and rapid; you will then see how harmoniously the shadows vary with the light—how, as the latter grows luminous, the others become less sombre, and how, as the one grows grey and weak, the other becomes dark and dull. Go, too, from such a

tudy of nature to a gallery of precious art-treasures, and study ome great master's landscape painting. You will not find *these* haracterised by the monotonous repetition of one poor scale of ones, but you will find the light which gleams out in the brilliancy of unclouded day has shadows peculiar to itself, and the light which spreads a softer radiance over the scene is served by none but dusky retainers peculiarly its own, that even where a great mass of shady sombre hues contrasts a smaller mass of tints of sunny brilliancy, the tones are so nicely true in each that the same light is as perceptible in one part as in the other. We, my dear fellow-student, must not, therefore, think it sufficient to look simply to the details for evidence of truth in our lights and shadows, but must carefully remember during the whole process of preparing, exposing, and developing, that to secure the most perfect truth in the relative degrees of intensity, in lights and shade, is the only source of harmony in reference to such important qualities, and that harmony and truth are here one and the same thing.

In the next place we will turn to the consideration of Harmony in the Expression or Sentiment of a picture.

Hazlitt, the famous art critic, in his essay upon the Elgin Marbles —of which more anon, should I treat of figures—defies any landscape painter to invent out of his own head, by jumbling together all the different forms of hills he ever saw, and adding a bit of one to a bit of another, anything equal to Arthur's Seat, with the appendage of Salisbury Crags, which overlooks Edinburgh; and this is not the only case by thousands in which "the finest nature," clad simply in the garments of its native truth, will also be "the highest art:" that is to say, art which has a soul in it—which expresses eloquently and forcibly some sentiment of grandeur and majesty, of joyous gaiety and brilliancy, of sublimity and beauty, or tenderness and delicacy, in short, which depicts not only the dead inert form, but conveys also the deathless spirit infused into it by that Great Artist of the Universe, whose mighty work it is. In securing this expression we must not forget that it is as subject to the laws already advanced as are more mechanical qualities, and, above all, it must be ruled in all its various phases by that of Harmony.

To illustrate a want of harmony in the expression of sentiment, permit me to refer to a well-known and popular work by *Perugina—The Martyrdom of St. Sebastian*, with which, doubtless, you are familiar. We there see the Saint enduring, with calm and solemn resignation, and with that gentle firmness which bears but does not mock with the bravado of a meaner courage, all the pangs and torture of his cruel death. The sentiment appeals at once to our hearts: it would be perfect were it not at the same time weakened, indeed almost destroyed, by the inharmonious character of the picture's several parts; for the background is quite a gay and lively scene, and the executioners—instead of having the spiteful or stern or even half-remorseful expression of such fearful agents—are slim, graceful youths, who, bending their bows with the most graceful curves of their Adonis-like limbs and forms, seem rather in playful sport than in such terrible and deadly earnest. To give a more homely illustration of harmony in the sentiment of a landscape scene:—Suppose you and I, with dark slides filled, and other apparatus, duly prepared, plunge into the secret shades of some ancient forest, in which tangled wildness of luxurious vegetation we discover a certain picturesque spot, so wild and gloomy in its solitary aspect that, pausing instinctively in admiration thereof, we soon find ourselves deeply influenced by the peculiar sentiments and ideas associated with such a scene—its solemn silence broken only by the awe-hushed whisper of the trembling leaves—its dim, mysterious light—its dark secret recesses—the fantastic curves and twists of the intertwined roots, showing here and there like snakes in the thick grass and weeds; these, and a hundred other *harmonious* incidents and objects, all tend to awaken in our minds a crowd of associated ideas whose influence is nevertheless rather indicated by our feelings than by active thoughts. Such are the feelings and thoughts which frequently teach us how cunning were those grim old Druids in choosing so fit a temple for the mysterious and awful rites of superstition—feelings which awaken half-timid thoughts, even here in England, of savage animals, in their no less savage haunts; of outcast, desperate men; or the concealed, ghastly evidence of murder's hideous guilt; or any other ideas associated with the mysterious or wild or terrible. Now suppose that, just as we have set up our tripods and determined that here we will expose a couple of plates, a pic-nic party of gay and fashionable friends bursts in upon us through the tangled undergrowth with merry shouts and noisy laughter, as harsh and discordant to our ears as their fashionable presence is offensive to our eye. But why is this? Just before, when we parted with these identical people out there in the full glare of the bright and cheerful sunshine, beside the laughing, unshaded river, with its myriad twinkling eyes, their romping noise and merriment were quite as unrestrained, although then we seemed to be lighter of heart and brighter of eye for seeing them, and echoed the joyous sounds as loudly as the noisiest there. The reason why is plain. Here, where all is mysterious and gloomy, they are *out of harmony;* while there, where all was joyous and bright, they fell into their places as fitting parts of the whole.

But it must not be supposed, from what I have said above, that contrast is always opposed to harmony. On the contrary, it is in the presence of contrasts only that the full value of this quality can be recognised.

I do not know that I can give a better illustration of this than is provided by the poet Thomson, in his harmonious picture of a dreary winter evening, when—

> "Along the woods, along the moorish fens,
> Sighs the sad genius of the coming storm;
> And up among the loose disjointed cliffs
> And fractured mountains wild, the brawling brook
> And cave, presageful, send a hollow moan,
> Resounding long in listening fancy's ear.
> Then comes the father of the tempest forth,
> Wrapt in black glooms. First joyless rains obscure
> Drive thro' the mingling skies, with vapour foul
> Dash on the mountains's brow, and shake the woods,
> That grumbling wave below. The unsightly plain
> Lies a brown deluge, as the low-bent clouds
> Pour flood on flood, yet unexhausted still
> Combine, and deepening into night, shut up
> The day's fair face."

Continuing this graphic description, each fresh instrument is in harmony with the rest. The birds seek their nests, "save those that love to take their pastime in the troubled air." The cattle, returning from the "untasted fields," seek, "with *meaning low*, their wonted stalls." "The crested cock, with all his female train, pensive and dripping," seek their chilly shelter; and all is gloomy, cheerless, and dreary. Now, a poet with no feeling or taste for harmony, and conscious only of the increased power and expression which such a scene would derive from its share of contrast, might turn at once to discordant images of sunny summer time with flowers and bowers, and zephyrs and singing birds, bright green grass, pleasantly basking and ruminating cattle, &c.,&c., &c., thus ruining the effect of all by putting together things which could not possibly combine into a whole.

Let us see how harmoniously, and yet how simply and unaffectedly, Thompson contrives to contrast this scene:—

> * * * * "The cottage-hind
> Hangs o'er the enlivening blaze, and taleful there
> Recounts his simple frolic. Much he talks,
> And much he laughs; nor recks the storm that blows
> Without, and rattles on his humble roof."

Here we have heat, light, and warmth contrasting with cold, darkness, and wet; cheerful laughter mocking the melancholy moan of the winter-wind; and safe shelter contrasting the associated idea of being shelterless in the boisterous, pitiless storm without. Still all this contrast is in perfect harmony with the whole, which is a winter evening.

With this we must for the present part company. I am rather too bold, perhaps, in thus urging upon your attention things which after all are very simple, but here is my only excuse. *These things have been neglected*, and I earnestly desire that this should no longer be the case. We will return to the subject of harmony when next you hear from

Yours, faithfully,
ALFRED H. WALL.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The first monthly meeting of the session, after the recess, was held at King's College, on Tuesday evening, the 5th inst. The Lord Chief Baron, Sir Frederick Pollock, occupied the chair.

The minutes of the previous meeting were read and confirmed.

The Secretary (Dr. Diamond) read a letter from Mr. Thomas Ross, accompanied by some photographs executed by Mr. Harrold, with one of Sutton's panoramic lenses. The photographs included an angle of 100 degrees, but the curved glasses were intended to include an angle of 110 degrees.

A letter from Mr. Dallmeyer was read, and a series of landscapes, six inches by five, taken by Mr. Wilson, of Aberdeen, with the triple achromatic lens, were exhibited: also some others by an amateur. They were

intended to illustrate the merits and capabilities of the triplet lens when applied to landscape photography. The whole of the pictures included a large angle, well defined, and free from distortion.

The PRESIDENT referred to the exquisite delicacy and beauty of detail contained in Mr. Wilson's pictures.

Mr. Vernon Heath exhibited numerous well-executed views in Perthshire and on the Thames, of about twelve inches by ten in size, taken with one of Mr. Grubb's aplanatic lenses.

A letter from Mr. Baynham Jones, of Cheltenham, together with some photographs taken with an ordinary view-lens of five-inch focus. were also laid before the meeting. The specimens were about six inches long—the angle being rather more than sixty degrees.

The Secretary of the Bradford Society, Mr. William Gordon Thompson, sent a letter calling attention to the projected Photographic Exhibition at Bradford.

A new instantaneous shutter was exhibited by Mr. Dallmeyer, and an explanation read. [See page 401.]

Mr. SHADBOLT thought it an error to suppose that the foreground would receive the greatest amount of exposure. The whole picture would depict itself through the part of the lens left uncovered. Uncovering one part of the lens before the other would only act in a similar manner to placing a stop in front of it.

Mr. DALLMEYER thought Mr. Shadbolt had misconceived the question, and that if he looked at the motion of the shutter he would perceive that the lower part by which the foreground was depicted was exposed first.

Mr. SHADBOLT still intended that it only acted as a diaphragm, reducing the aperture, and giving less illumination to the whole image.

The LORD CHIEF BARON said he remembered being taught at Cambridge that a bit of a lens—half of a lens—saw the whole picture.

Mr. DALLMEYER explained that this would be the case with a single lens, and in regard to central pencils; but it was not the case with eccentrical pencils. This shutter was intended to be used with his double combination lenses.

Mr. SHADBOLT said that if it were to be used with portrait lenses it would, of course, as Mr. Dallmeyer stated, expose the foreground first.

The thanks of the meeting were awarded to the various gentlemen who had exhibited specimens, &c.

Mr. T. A. MALONE then gave, *viva voce*, the substance of a paper *On the Nature and Toning of the Photographic Image*. [See page 401.] Before proceeding with the subject, Mr. MALONE stated that, in some respects, he must claim their indulgence, having been of late much employed in experimenting, and giving the most of his time to that end. He had made one or two attempts to throw the result of some of his experiments into form upon paper, but had not succeeded to his satisfaction, being, during his endeavours, seized by influenza and prostrated with a cold. It was only by careful nursing that he was enabled to appear before the meeting.

When Mr. Malone had concluded,

The LORD CHIEF BARON gave expression to the pleasure he had felt in listening to Mr. Malone, and to a desire to hear the results of his further experiments; and thanked him for the hope held out of Mr. Malone's resuming the subject on some future occasion. While observing the beautiful experiment of such a heavy substance as gold held in suspension by a minute division of its particles, he had been struck by the idea that it explained what he had often wondered at, viz., the suspension of clouds in the atmosphere.

Mr. MALONE said that clouds undoubtedly were composed of water in a minute state of division, and not in small bladders.

The LORD CHIEF BARON thought the last one of the most absurd notions conceivable. Clouds in such a finely-divided state could float about, and directly the particles were condensed into large ones, came down as water. He thought the theory of colours depending upon the size of the particles one of the most beautiful he had ever heard. He had much pleasure in announcing to the meeting that during the session Mr. Warren De la Rue would give them a narrative of his visit to Spain, for the purpose of photographing the sun during its eclipse. He must here remark that he had always expressed a hope and conviction that photography would be the means of extending their knowledge of the various phenomena of light, and of discovering facts in connexion with the sun of which they little dreamt. It had been already shown that when the human eye was blinded with excessive light, photography could delineate what the human eye could not even perceive, and thus help us to a further knowledge of the sun otherwise unattainable.

The SECRETARY read a letter from Mr. Rouch, enclosing a contribution to the Archer fund from the Photographic Society of Victoria, amounting to £5.

The usual votes of thanks were passed, and the meeting terminated.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

THIS Society held its ordinary monthly meeting on Thursday evening, the 7th instant,—Mr. A. Mactear occupying the chair.

Mr. A. Robertson read a paper on the subject of *Alkaline Toning*. [See page 399].

Mr. JAMES CRAMB said Mr. Robertson had given his manner of conducting alkaline toning, but, he thought, had scarcely touched that part of the subject intended for consideration now—the difficulties and danger of this plan of toning. He thought Mr. Robertson had given the merit o originating this system of toning to the wrong man. Mr. Waterhouse, of Halifax, *not* Mr. Maxwell Lyte, was the gentleman who first gave to the world the plan of toning by an alkaline chloride of gold. This had been so prominently remarked on by Mr. Hardwich, in bringing it before the London Photographic Society, that he could not understand how the mistake had been made.

Mr. Ewing and Mr. Mactear both expressed themselves as of the opinion put forth in Mr. Robertson's paper.

Mr. JOHN CRAMB said he had no doubt about the paternity of the improvement in toning. Mr. Maxwell Lyte had done a great deal for the advancement of photography, and been, in many cases, denied the merit of his discoveries, and he (Mr. Cramb) had a very high opinion of Mr. Lyte, and would be the last to do aught to detract from his justly eminent position in the photographic world; but here he had no doubt Mr. Lyte was not the first to propose an alkaline chloride of gold for toning.

Mr. EWING said it would be found so stated in the Almanac of THE BRITISH JOURNAL OF PHOTOGRAPHY.

Mr. JOHN CRAMB said he understood that toning by carbonate of soda and chloride of gold to be Mr. Waterhouse's plan, and the addition of citric acid to be Mr. Hardwich's. The second plan of using a phosphate along with the gold was Mr. Maxwell Lyte's. The use of acetate of soda and chloride of gold was given to the French Photographic Society by the Abbé Laborde; and the fourth modification of the alkaline toning, in which he would notice the use of chloride of lime and chloride of gold, was by Gustavus Legray, who first proposed the use of chloride of gold for toning prints many years ago.

Mr. JAMES CRAMB said he thought the permanence of prints toned by the alkaline process had been much over-estimated, and he had no doubt there was a large number of prints now produced by it which were far from permanent. In his opinion, if the greatest care were not taken to wash out the gold before putting the prints into the hypo., a worse result would follow than if they toned at once in a gold and hypo. bath. The hyposulphite should also be very frequently changed, and be abundantly strong.

Mr. JOHN CRAMB, referring to the effect produced when the print was put into the hypo. without being washed from the gold, said that the difference then from the alkaline and the gold and hypo. plan would be that, in the former, they secured the whole of the dangerous consequences by making the decomposition of the hyposulphite in the body of the print, while in the latter it was done in the bath before the print went into it. On the point of permanence, he would wish most particularly to dissent from an opinion expressed by a writer in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY; *On Cheapness*. The writer of the article seemed to think that all faded photographs had been the production of low-class photographers, and that fading was the offspring of cheapness. He (Mr. Cramb) had some years ago purchased at an Exhibition prints by Delamotte, Bedford, and others. They had completely vanished, or rather had become pieces of yellow paper. These were not cheap productions. Price alone would not be a measure of permanence in photographic productions. He need not say he fully agreed with the recommendation made by his brother to avoid the imminent risk of fading in prints toned by the alkaline process. He might mention again what he had before remarked, that there never was a faded print seen by them while they toned with the modification of the sel d'or process, which they practised before the alkaline process came into use. The alkaline process was no important improvement on any point. It took less gold and was sooner got through than toning by the sel d'or process, but there the advantage ended. Mr. Cramb concluded by promising, at some future time, to give in full the manner in which he and his brother toned their prints before the alkaline plan of toning was adopted, and by which so perfectly permanent results had been produced.

Mr. MACFARLANE said he did not believe there was such a thing as a permanent print.

Mr. JOHN CRAMB requested the members to inspect the prints exhibited by him at the Edinburgh and London Exhibitions, three or four years ago, and which were still in the same frames, and could be seen by any one to be unfaded in any degree.

Mr. ROBERTSON exhibited a silver bath made from a piece of plate-glass inserted in a wooden frame: it was likewise adapted for a printing frame. He also submitted a washing dish made by inserting a syphon into a shallow milk tub; but, while stating his opinion that the original idea belonged to Glasgow, he expressed his belief that there had been simultanous inventions of the same kind.

A conversation then followed on instantaneous pictures and moonlight photography.

Mr. JOHN CRAMB said he had, at considerable personal inconvenience, gone to Birmingham to see the pictures of Mr. Breese. If that gentleman had a process by which he could take pictures by moonlight, he submitted the question—Why were there so many *figures which had moved* in his *so called* instantaneous views of the Queen's visit to Birmingham, though it was evident they were done with the full aperture of a *double lens*, there being only a small part in the centre of the picture in passable focus? It really seemed to him that the Frenchman's suggestion, that the whole thing was a hoax on the editor of the *Photographic News*, was near the truth of the matter. The only truly instantaneous views he had ever seen

were those of M. Ferrier. In these there was not, so far as he could discover, the smallest movement in any figure, even in the view of the crowded *Boulevard de Sebastopol.*

Mr. Macfarlane showed some stereo. slides as illustrating what could be done by the collodio-albumen process. He used a Dallmeyer stereo. lens, with which he was much pleased.

Mr. Robb showed some transparent positives and negatives by the resin and tannin processes, and a negative by the Fothergill process.

Votes of thanks were passed to the exhibitors of pictures, &c.

The Secretary then called the attention of members to the panoramic lens and apparatus sent for exhibition by Mr. Ross. Much interest seemed to be felt in examining the lens and camera. Several members expressed doubt if the horizontal lines would be correct in a picture produced by this lens. It was thought by some that in pure landscape this would be of little consequence, though others seemed to doubt it.

A very cordial vote of thanks was passed to Mr. Ross for his courtesy to the Society.

The Secretary gave notice of some important alterations proposed to be made, at the next meeting, in the constitution of the Society.

BRADFORD PHOTOGRAPHIC SOCIETY.

This Society held its annual meeting on Wednesday, the 6th instant. Mr. Leather occupied the chair, in the absence of Dr. Parkinson through indisposition.

Mr. Stanley, the Treasurer, read the Annual Report, which gave satisfaction to all present.

The Chairman then said, if no member desired to ask any questions relative to the balance-sheet, he would call upon the Treasurer to distribute the presentation photograph.

Mr. Stanley said, as all the members knew the photographs before them were the production of Mr. Mudd, of Manchester, and all of beautiful tone, there could be little fear of getting wrong; but, to avoid the first person choosing having what he might regard as the best print, he had placed the name of each photograph on a piece of paper, and put them into a bag, and would select one of the members to take them out, one by one.

This occupied so much time, that several matters for the improvement of the working of the Society during the coming year were postponed until next meeting.

It was unanimously agreed that the election of officers should take place at the next meeting.

The usual vote of thanks to the Chairman terminated the proceedings.

Foreign Correspondence.

Paris, November 10th, 1861.

I had hoped that in this letter I should have to give you an account of the first meeting of the season of our Photographic Society, but that meeting has been deferred. You see that we take things pretty much at our ease in this country, and that punctuality is no more a characteristic of societies than of individuals. It is much to be regretted.

The Committee entrusted by the Society with the adjudication of the Duke de Luynes's prize as far as regards charcoal printing processes (for engraving, lithography, &c. are to be treated apart), have commenced their labours. The methods submitted to the Committee have been published, and are sufficiently well known to enable those who study such matters to form a judgment on the subject. The only really important point remaining to be examined is the practicability of the processes in question. We had been told that the Committee would require a certain number of select *clichés* to be executed by the candidates in their presence; this appeared to us the only system admissible, for if so the chances were equal for all. If, however, we are now rightly informed, this plan is not to be followed; the Committee will remit the *cliché* to the competitors *in succession*, so that they may operate at their leisure. Not only is this an unusual mode of proceeding in such cases, but it has also the inconvenience of rendering the conditions unequal. As the sunshine and temperature play an important part in the processes to be judged, it is evident that if one operator has been enabled to profit by the fine days of summer, he will have a considerable advantage over another who has but just received the negatives selected, and who will have to overcome, as best he may, the difficulties of the bad season. We trust that the members of the Committee will take these facts into their consideration, and not pronounce a decision till they have seen the competitors operate in their presence.

An experiment connected with this subject was made the other day at M. Edouard Delessert's. A large-sized prepared glass, covered with a solution of perchloride of iron and tartaric acid, in accordance with M. Poitevin's latest method, was substituted for the screenholder of the amplifying apparatus. After twelve minutes, the image appearing to have had sufficient time, the charcoal powder was applied. It was then seen that the exposure had been too short, and, as the sun had disappeared in the meanwhile, it was not possible to renew the attempt. However, the picture was perfectly distinct, very soft, and delicately modelled; with a little more time it would have surpassed those which are obtained by contact. This result proved that with the charcoal process we can obtain amplified positive pictures at least as good as those on paper prepared with chloride of silver, and that in a space of time almost as short.

M. Delessert has recently made a very amusing application of photography. It is a little instrument, which he calls the *Photographic Kaleidoscope*, and which is composed, like the old *Phenakisticope* that everyone knows, of a disk with slits, through which may be seen a succession of images, placed circularly upon another and moveable disk. The pictures represents one or several personages in different positions. Various aspects of the same object being presented to the eye in rapid succession, a very striking illusion of movement is produced. M. Delessert has made, for instance, the portrait of a bass-player in different positions. The gesture of the hands, one holding the bow and the other slipping up and down the strings, and the movement of the feet, now planted on the ground, now raised in the air, are so lifelike that the performer seems to be playing with enthusiasm and energetic *allegro*, while he conscientiously keeps time with his foot. Children will be thankful to M. Delessert for providing them with this New Year's gift of so novel a kind; and indeed, I could scarcely venture to affirm that grown-up persons will not take their share of pleasure in the amusement.

There is some talk at present of a project, the execution of which would be impossible without the aid of photography. It is said that the government intend to form a collection composed of the portraits of all the members of the Legion of Honour—from the simple *chevalier* to the *grand'croix*. This would not be a small affair, and the *album des legionnaires* would count a good number of volumes. In the chief town of every department a photographer would be required for the execution of these portraits. It is even said, several provincial photographers have received the official letter entrusting them with this mission. I have not yet been able to ascertain whether the fact is so or not; but I see nothing improbable in the report. I have seen a picture of the panorama, taken by Auguste Bisson on the summit of Mont Blanc, and I have asked myself whether the physical discomfort which is felt on that height is not greatly augmented by the profound impression produced upon the mind by the spectacle which lies beneath. That ocean of mountains surrounding you, and spreading away in countless waves, farther than the eye can scan—the absence of every sign of life—that terrifying solitude high up between the clouds and sky—the silence—the light inundating, and seeming to envelope you—all this must act powerfully upon the mind and the nervous system. I confess that I experienced an almost painful sensation in examining this curious picture, which holds you, as it were, spell-bound by an effect, not of abysmal depth, but of vastness.

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

ZINC PLATE-BOXES.

To the Editor.

Sir,—I intended to have written to you in time for your last number, as I wished to add my testimony to Mr. Hornby's, about the spots caused by the zinc plate-boxes. We have compared spots, and find them to exactly correspond, though we work different processes. I took four dozen plates to Scotland at the beginning of the autumn, and, to my extreme disgust, every plate (except six I had placed in my dark slides previous to starting) became, during development, covered with opaque spots, caused by the minute particles abraded from the box by the friction of the plates against it.

I am glad, however, that I did *not* write before, as it enables me to correct an inaccuracy contained in your note to Mr. Hornby's last letter. You advised that he should varnish his boxes with japanner's gold-size, as it will always remain slightly tacky. If you had ever used it for its legitimate purpose you would know to your cost that, after a short time, the tackiness so entirely disappears that the gold leaf will not adhere.

I happen to have by me a piece of metal, varnished with the size, and, that you may see it is not adapted for coating the plate-boxes, I enclose some varnish dust I have rubbed off it with the edge of a glass plate.

I find that there is a very simple way of avoiding the spots on any plates having a dry hard film. A soft camel-hair brush passed over the surface, previous to development, effectually removes the offending particles.

I was glad to find from the reports of the Edinburgh Photographic Society, that my letter to you had induced some of the photographers of that city to try the hot-water process, and that they were so well satisfied with it. I am quite sure the longer they practice it, the more *confidence* they will have in it, which (judging from my own somewhat extensive experience of dry processes), is more than can be said for most of them.

When I sat down to write to you, I intended to have told you for the benefit of those of your readers who like brilliancy and transparency in their prints, how I obtained both, without the use of highly albumenised paper; and so avoid the toning troubles and expenses which result from its use.

My letter is however so long that I must defer doing so till next month.

I am, yours, &c.,
A COUNTRY PARSON.

[Our suggestion of japanner's gold-size was, as it professed to be, *merely a suggestion*, and we are obliged to our correspondent for detailing his experience of its inefficiency. Our readers will, no doubt, be glad to receive the information so kindly promised at the close of the preceding letter.—Ed.]

TONING AND FIXING DEFERRED.

To the Editor.

Sir,—Printing-day has always been, by myself at least, looked forward to as a time of toil rather than of pleasure, entirely in consequence of being obliged to finish the same day all the papers sensitised, instead of being enabled to close the day's photographic work, when so disposed, for some occupation more congenial to the feelings of the afternoon. A delay till the following day, even in the completion of the proofs, I have found to materially detract from the brightness and purity of their high lights, the shadows also not being free from injury.

By adopting the following method I am now enabled to print on one day and postpone the toning and fixing until a more convenient one—it may chance to be to some non-actinic or rainy day, a week or longer forwards. Participating in the same partiality for leisure and recreation with amateurs in general, I have found my present plan of printing of great advantage and convenience, and, therefore, would desire to communicate it to my brother amateurs, more especially to those who may inherit the same propensity to love of ease as myself.

A regular reader of all the photographic periodicals, I am somewhat surprised at not having long before seen my present method proposed. Still be it understood that I lay not a shadow of claim to originality, well knowing that the use of the simple chemical effecting it is almost as old as photography itself, although not exactly applied to the present purpose.

Now for the pith of my story. Judging by the early morning that a propitious day for printing is in prospect, I sensitise as many sheets of paper as I shall be likely to require. I hang them up on a line for about twenty minutes or half-an-hour to drain. Having, in the interim, filled my drying-tin with hot water from the kitchen fountain, I place thereon a sheet or two of bibulous paper, and quickly complete the drying of each paper separately by laying it thereon, keeping it evenly down on the heated surface by a weight at each corner. The drying-tin is a closed vessel, about one and a-half inches in thickness, and an inch wider all around than the usual size of the sensitised sheet, raised a little in the middle, in order to secure the perfect contact of every part of the paper with the heated surface below, and having a tube of an inch bore at one corner by which to pour in the hot water.

A few minutes suffice to fit the papers for the printing-frame, the operation of which does not bear on my subject.

The printing process satisfactorily completed, the proofs, after careful washing in several waters, are plunged into a weak solution of common salt in water, moved about occasionally for ten or fifteen minutes, taken out and washed again in many waters, hung up in a dark room, and, when dry, stowed away between the leaves of a perfectly dry and clean blotting-book. The salting operation, after the removal of the superfluous nitrate of silver by common water washing, I need scarcely add, merely changes the remaining tinge of nitrate into chloride, thereby only adding a little more to the paper's previous stock of that salt. The proofs will now remain unchanged until a convenient season presents itself for finishing, when, after being plunged into ordinary water, taken out, hung up, and well drained, they will as satisfactorily go through the subsequent processes of alkaline gold-toning and fixing, as though no interval had taken place between their printing and final finishing operations.

Although the adoption of the above simple plan has proved a boon to myself, still its publication may be considered by you as useless, or, perhaps, unnecessary. If so, pray do not scruple to commit the present communication to the waste-basket, thereby saving the time of the printer, as well as that of your large circle of readers. If thought to be an additional and unnecessary trouble by many, who may assert that the sensitised sheets keep for several days without the least injury, both before and after being printed on (which assertion does not accord with my experience), still the above method gives the advantage of keeping the printed sheets for an indefinite length of time, toning at last as quickly and as satisfactorily as if done at any earlier date. Be it as it may, I leave it to the option of those who may think it worth their while to adopt it, or otherwise.—I am, yours, &c.,
HENRY H. HELE.

Teignmouth, November 8th, 1861.

[Though better results are to be obtained by the precautions herein given than by leaving them altogether unattended to, we have not found in our own practice that proofs thus treated, are quite equal to those in which the toning operation has been at once proceeded with.—Ed.]

ANSWERS TO CORRESPONDENTS.

Albert.—See leader.

M. M.—Received with thanks.

R. O.—A mere hoax: see leader.

S. T.—Received: notice in due course.

London Member.—The subject was not discussed.

W. Woodward.—We have forwarded your note as requested. Thanks for inquiries.

Thos. Ward.—We have an article in progress that will afford you full information on the subject.

C. J. Riesley.—Warm your developer as well as the plate, and use but very little silver at first.

Enquiris.—Received, but in a hundred or more pieces: it is quite impossible to judge from the fragments.

W. Bissell.—Both letters received. We are glad to find you have discovered for yourself, the source of your difficulty.

Pupil.—Your formula is very good, it must be your manipulation that is at fault; get some friend to give you a practical lesson.

M. O.—It would be nothing but waste of time to make such an experiment as you propose: we *know* what would be the result.

M. J. P.—1. We do not think it worth the smallest notice.—2. Useful in some cases, but not to be indiscriminately applied.—3. See Vol. IV. page 166.

Querist.—We cannot undertake to test apparatus for private information; if we do it at all, the result, whether favourable or the reverse, must be given to the public.

Fred. Grant.—Your lens is of too short a focus to give satisfactory results of the kind you desire, unless they are on too small a scale: you had better procure another of larger focus at once.

F. Barnham.—Your note arrived on the day of our going to press, consequently too late for reply in our last; but you will have found a solution of your difficulty in one of the papers therein published.

Australian Amateur.—Nearly all the dealers in photographic apparatus can now supply you with glass baths: see our advertising columns. One at least of the advertisers mentions the article very specifically.

South of France.—An old correspondent, a microscopist and amateur photographer in delicate health, proposes a trip for three or four months to the South of France, and inquires whether we know a congenial spirit who would accompany him, and share expenses. If any of our friends would like to do so, and will communicate with us, we will endeavour to make matters fit.

Perplexed.—Your collodion does not contain enough gun-cotton for the amount of iodising material used: make some plain collodion, with a large quantity of pyroxyline, and add a small portion of it to the iodised collodion. You enclose your name and stamps for a copy of the Journal, but *omit your address*, hence we can only forward it through our Glasgow agent, from whom you say, you usually procure your copy.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 155, Vol. VIII.—DECEMBER 2, 1861.

The British Journal Photographic Almanac for 1861 having been received with an amount of approval far exceeding our most sanguine expectations, it is the intention of the Proprietor and Publisher of this Journal to issue a corresponding one for the year 1862, which, like its predecessor, will be Edited by Samuel Highley, F.G.S., F.C.S., &c., and will be adapted for carrying in the pocket-book. It will contain, besides a Calendar for the year 1862, "A Retrospect of our Photographic Year;" Days, Hours, and Places of Meeting of Photographic and Scientific Societies; Formulæ for Wet, Dry, Instantaneous, Negative, and Positive Collodion Processes; Albumen Process, Waxed-Paper Process, Printing Process, &c.; "Photographic Olla Podrida," Useful Tables, Measures, Notes, &c.; and a large amount of other valuable and interesting information. A copy of the Almanac will be Presented with every copy of this Journal issued on the 1st of January next, and it will be on sale to non-subscribers at the nominal price of Threepence per copy.

To avoid interfering with the portability of the Almanac, the space devoted to advertisements will of necessity be limited. We are therefore requested by the Publisher to intimate to those wishing to take advantage of so desirable a medium for permanently advertising, that early application for space will be requisite, in order to avoid disappointment and ensure insertion. Further particulars will be found at page iv. of the advertising sheet.

The Composition of the Photographic Image.—Every scientific photographer will doubless feel gratified that Mr. Malone is engaged in an attempt to solve this perplexing problem, and probably pleased as well as surprised at his having so strongly pledged himself to an opinion upon its nature as that expressed in his impromptu address delivered at the last meeting of the Photographic Society. We must admit that we are by no means satisfied that the question is yet determined; and supposing Mr. Malone should hereafter be enabled satisfactorily to prove that his deposit of what he designated *ruby silver* (but which, by the way, was not of a ruby colour but brown), is really metallic silver in a minute state of division, although the probabilities are in favour of the photographic image being identical with it, such a proposition would scarcely then be proved, because other materials are present at the genesis of the picture which were absent in Mr. Malone's experiments. But will the ruby (brown) silver be demonstrable as merely metallic? We entertain a doubt, because wherever carbon is present with the nitrate of that metal there is always a considerable risk of its entering into combination with the oxide of the metallic base.

One remarkable statement was made in the course of Mr. Malone's address which arrested our attention particularly—we mean that relative to the very extended time the ruby gold would remain suspended in the water without becoming deposited, a hint being thrown out that it may be in some measure soluble therein, The question appears to us sufficiently easy of solution: microscopical examination would infallibly settle it. On mentioning this subsequently to Mr. Malone we understood him to affirm that microscopical examination had been resorted to without detecting any particles of matter, merely colouration being visible; and, if this be the case, we contend that, despite the subsequent aggregation of the particles, as Mr. Malone considers the phenomenon, he has no just ground for regarding the coloured liquid otherwise than as a *solution*. How else can we distinguish between a solution and mechanical diffusion? There is, however, another fact to bear in mind: it does not follow that, because any particular observer failed to detect the particles, they were not to be detected. We should desire to know who was the observer and under what circumstances was his observation made?

As a chemist Mr. Malone would scarcely deny the possibility of body being held in true solution, yet allowing of the formation of a deposit after the lapse of some more or less extended time by decomposition; therefore, the final result being a deposit, incapable of resuming its former intimate state of assumed diffusion through the liquid, it must have undergone some change of character. But, whatever way the question may be finally settled, we hail with pleasure the new researches which will be sure to be undertaken in consequence of Mr. Malone's introduction of the investigation.

Albumen Process.—The albumen process possesses some qualifications of such peculiar advantage, under certain circumstances, that we cannot forbear drawing attention to a short and very unpretending paper by Mr. Noton, of the Manchester Society, which appeared in our last number, page 404. The predominating difficulty hitherto with the albumen process has been that of rapidly drying the film, so as to retain its uniformity of thickness, &c. This, according to Mr. Noton's experience, is to be accomplished by the simple expedient of placing the coated plate on an ordinary hot-water plate for the space of a single minute. We shall be interested to learn whether the experience of other operators tallies with that of Mr. Noton.

Photography at the International Exhibition.—Photography is now a matter of such widely-spread interest that it is almost impossible even with the utmost diligence to keep *au courant* with everything which appears in the daily and periodical press in connexion with it. If the new and the true alone were concerned the task would be comparatively trifling; but unfortunately much appears which is untrue, and still more which is anything but new.

A few days prior to the publication of our last issue we read in the *Daily Telegraph*, in one of the very interesting articles which appear from time to time in that newspaper on the progress of the Exhibition, a paragraph relating to photography, in which there was a considerable amount of fiction, or rather misapprehension, based upon a very small quantity of fact. The portion of the paragraph to which we more particularly allude is the following, viz.:—

"It is a consideration, further to be taken into account, that the practice of photography has received governmental aid abroad, and has been fostered to an extent not aimed at in this country. When we see those grand architectural pictures by the Brothers Bisson, we may be

sure that accurate representations on so large a scale are not achieved without the aid of a costly apparatus. Indeed, it is a known fact that such a lens as that employed to photograph Rouen Cathedral and the Porch of Notre Dame costs from five hundred to a thousand pounds, or even more. To enable photographers to meet these vast expenses, so far beyond their ordinary means, the French Government comes forward with liberal grants of money. It is hardly necessary to say that state assistance in such matters does not accord with English notions; but this is all the more reason for extraordinary efforts to cope with the favoured art of other nations."

After perusing the preceding we could not forbear making a note for future comment. That such a statement should be made at all is surprising, but is still more so when it appears in the *Daily Telegraph*, an organ not the most likely to detract from private as compared with governmental enterprise in England. But that which excites most astonishment in us is the extraordinary mistake relative to the value of Bisson's lens, which would be more correctly described by shillings rather than pounds, in the statement above made, as to number, and in all probability has really arisen from a mistranslation of *francs* into *pounds*.

With regard to the actual relative outlay by English and French operators in apparatus, we very much fear that where the latter spend hundreds the former do the same with thousands. So much for accuracy on this point. In a previous part of the article, too, we find a singular misconception relative to "one of the most influential sections of the great modern guild," which would be amusing were it not mischievous, as promulgating amongst the outside public a very erroneous notion of the real feeling entertained by the majority of photographers on the question at issue between themselves and the Royal Commissioners. While on this subject we would refer also to an article which recently appeared in *The Mechanics' Magazine*, in which this particular phase is treated with unusual lucidity by one not directly connected with our art, and from which we extract the following:—

"We are aware that an unseemly question has arisen between the Commissioners of the New Kensington Palace and the principal exponents of the art of photography, as to the rank and position it shall take in the halls of that place. We certainly see no good reason for excluding photography from the fine arts department, as there is ground for fearing it is the intention of the ruling powers of the International Exhibition to do. The photographer, in the sense in which we understand the term, is as much entitled to be considered an artist as is the engraver or the painter, and the works he produces are as much works of art as theirs. In saying thus much, we have no wish to disparage the labours of the engraver or the painter, but rather to elevate the labours of the photographer. To form a perfect photograph, a great deal of delicate manipulation is required on the part of the operator, who also must understand completely the effects of light, shade, and distance. Chemistry must have been mastered by him—at all events so far as it has any bearing upon the art he practises—if he is to be anything like successful in the practice of the latter. The effects of careful groupings and of colours must also be known to him, and more especially so in photographic portraiture. In short, it seems to us that a gross injustice will be done to photographic artists if, in the Exhibition of 1862, photography be not allowed to occupy the position which the voice of public opinion awards to it, namely, that of one of the fine arts."

We regret exceedingly, however, that in the earlier part of the article from which the preceding is extracted (and which treats of the abridgment of patent specifications connected with photography, published a short time back) some remarks appear which, though inadvertently so, are likely to promulgate some erroneous notions. It is assumed that the 280 persons who are the alleged inventors interested in the patents specified have all, or most of them, "assisted in developing the art of photography," and that "public acknowledgment is due to each." Now, the fact is notorious to the well-informed in connexion with our art that, with some few noble exceptions, the patentees, instead of having "developed the art," have rather put shackles upon it; while *most* of those to whom honour is due on this head have freely given the results of their labours to the public: we may cite in particular, Sir J. Herschel, Mr. Archer, Dr. Percy, Mr. Robert Hunt, the Rev. J. B. Reade, and a host of others whose names are not to be found in the patent list.

Lest we should run the risk of being altogether mistaken, we may remark that we gratefully acknowledge the obligations of photography to some few amongst the patentees — Talbot, Claudet, Mayall, and some others; but such men as these are the exceptions amongst them — an overwhelming majority having been nothing less than either useless or obstructive. One of the names specially cited by our worthy contemporary as belonging to the *benefactors* is superlatively droll as appearing in that capacity, his share consisting in the addition of a small piece of looking-glass to an ordinary lenticular stereoscope—an addition so obvious as to have been practised by many long before the existence of a patent for it, and bearing but a very remote connexion, if any, with the art of photography.

Moonlight Stereographs. — Our readers will no doubt recollect some remarks published a short time back by M. Gaudin, indicative of his conviction that the Stereographs by Moonlight mentioned in the pages of our contemporary, the *Photographic News*, as having been executed by Mr. Breese, of Birmingham, were really taken by sunlight, and further giving very philosophical reasons for concluding that, in the present state of chemical knowledge, it would be impossible to produce a *bona-fide* "moonlight" view. While equally convinced of the correctness of this conclusion, we did not, like M. Gaudin, attribute the assertion made to mendacity, but to some misapprehension; and we are pleased to find that such has really been the case—the whole confusion arising from an error of diction, as will at once be perceived on perusing a communication, to be found in another column, from Mr. J. T. Brown, Jun., the Hon. Secretary of the Birmingham Photographic Society. It turns out that the pictures to which allusion was made are *instantaneous stereographs of* the moon—a very different affair to instantaneous moonlight views, for by all the ordinary rules of language the latter designation would apply only to views illuminated by the reflected light from the moon's surface. Of course Mr. Breese is not responsible for the erroneous nomenclature. We might take a negative of the flame of a candle, but we should not therefore be able to take a candle-light view. We cannot doubt that Mr. Breese has made some very considerable advance in exaltation of chemical sensitiveness, as the production even of *instantaneous* lunar images evinces; and we sincerely regret that from so droll an error of language he has been subjected to so much suspicion.

King's College Photographic Lectureship.—Few of our readers will have forgotten that our former fellow-labourer and esteemed friend, Mr. Hardwich, was the apostle of photography, as a recognised branch of scientific instruction, at King's College, London; and owing, doubtless, to his genial and amiable disposition, combined with his unquestionable skill as a chemist, the office which he filled as lecturer on photography enjoyed much popularity. After Mr. Hardwich's withdrawal the post was for a short time filled by Mr. Thomas Sutton, but was again recently vacant owing to his retirement. We have much pleasure in announcing that, by the appointment of Mr. George Dawson, of Bath, there is every reason to expect not only a continuance but, if possible, an increase of energy in the promulgation of our art. Mr. Dawson's name will, of course, be familiar to our readers as a valuable member of the North London Photographic Association, and also in connexion with some important papers, published in this Journal, relative to the action of the fixing bath of hyposulphite of soda upon the positive proofs, and others, in which a knowledge of chemistry, combined with considerable manipulative and photographic skill, were requisites to any one undertaking the necessary investigations. All these qualifications are possessed by Mr. Dawson, in addition to being accustomed to communicating instruction orally in those branches of the physical sciences to which he has devoted his attention. We are, therefore, justified in congratulating the authorities of King's College in having secured so valuable an addition to their staff.

ON SIMPLE DRIED COLLODION WITHOUT A PRESERVATIVE AGENT.

By W. Hislop, F.R.A.S.

[Read at a Meeting of the North London Photographic Association, Nov. 20th, 1861.]

ALTHOUGH the various processes for the preserving of surfaces in a state of sensitiveness to light are so numerous, it can hardly be asserted that we have yet attained perfection. Exquisite pictures have occasionally been obtained by almost every process; and yet we are continually hearing of something fresh, or some revival of something old. Some new preservative or some new method of manipulation is announced as perfection and as simplicity itself. A pamphlet is written, and it comes forth to the public so full of details and precautions as to make its utility doubtful to those whose aim it is to get *pictures* and not the pleasure of preparing plates.

The proper line of direction seems now to be to simplify details, and, with the materials which we possess, to endeavour to shorten the manipulation as far as possible.

It may probably be thought to be going too far to say that we have been experimenting in a wrong direction, in devising all sorts of applications to the plate to preserve it; still I have no doubt in my own mind that it will ultimately be found that the effect of these applications has only been to mar and spoil an exquisitely delicate surface, which requires rather to be kept from contact with any extraneous substances whatever.

It has long ago been stated that the dried collodion film is sensitive to light; but the statement has been made in so doubtful a manner and with such qualifications that few have ventured even to try the experiment. Among other things it has been said that the pores of the collodion must be kept open, in order to allow the developing agent to penetrate the film and bring out the picture. Then various substances have been applied to its surface, and in most cases carefully washed off again, and we are told that some mysterious effect has been produced on the film which enables the desired result to be obtained. Recently we have had several processes in which the great difficulty is the non-adhesion of the film to the plate, rendering some previous operation necessary for keeping it fast. Major Russell advocates the general use of some such means, as he asserts, and truly so, that it is desirable in all dry processes.

Now, it is a simple fact, and that without any qualification, that no preservative substances whatever are required: good pictures can be got without them. If the film be excited in the ordinary way, well washed and dried, it will be found sensitive still, and as sensitive as the best of any other dry process. More than this, it will be found perfectly easy to develop the picture. It comes out quickly and with ease, and is perfectly under command. The results will be found very similar to those which would be obtained with the same collodion in a wet state, except that there is a slight loss of intensity. If a small quantity of common resin—say half a grain or a grain to the ounce—be previously added to the collodion the intensity will be very materially increased, and for transparent positives a very beautiful colour will be obtained.

One great point, I find, is to keep the sensitising bath very acid with *acetic acid*. The only other precaution is to adopt some means of keeping the film on the plate. This may be done either by painting the edge with varnish or covering the surface with gelatine or albumen. I much prefer albumen. I simply add the white of an egg to eight ounces of water, with about half a drachm of glacial acetic acid, shake the whole well together in a bottle, let it stand a few hours, filter it, and bottle it for use. The quantity is sufficient for a very long time, as it is simply poured on and off again into the bottle—if necessary, helping it to spread with a glass rod. The plate is then dried before a brisk fire, put by to cool, and then the ordinary manipulation is followed.

I prefer washing in a series of dishes, pouring over the plate, when taken from the last dish, a gentle stream of water to remove any particles which may have settled upon it. The plate is then dried spontaneously, and stored away for use.

I have tried several sorts of collodion, and find the same especial results. The qualities of each sample come out on the dried plate in the same way in which they are apparent in the wet state.

Let it be understood I claim nothing as new. I only know that, after years of labour and failures, I have at length found a method of getting pictures which supply my wants. I know beforehand that if I can get a good picture with the collodion in a wet state, that I shall get the same results, or even better, in a dry condition. I speak advisedly when I say *better* results; for the amount of detail which I have thus got in my dry negatives could never be obtained with the same material in a soft spongy condition.

ON PHOTOGRAPHIC DISTORTION.

By Robert H. Bow, Civil Engineer, Edinburgh.

[Read at a Meeting of the Edinburgh Photographic Society, November 6th, 1861.]

So many peculiarities of the photographic picture may be classed under this head that the term is very indefinite, unless it be understood to mean the total bad effect arising from the accumulated distortions of various kinds. Or it would perhaps be better to use the term in the plural number, and attach distinctive epithets to the several varieties of distortion. I here offer what is probably an incomplete list of the photographic distortions.

First.—We very frequently have an appearance of excessive enlargement of the nearer objects in a picture. This is more striking in the case of photographs of objects placed very near the camera, and taken with a lens of short focus. It consists of a perspective distortion arising from the distance from the eye at which the picture is held when inspected in the hand being far in excess of that distance with which the perspective is in accordance. Now, as portraits are most liable to this kind of distortion, and show it in a most offensive way, we may be allowed to distinguish it as the "portrait distortion."

Second.—We have very commonly either a contraction or enlargement of scale at the margins as compared with the centres of photographs, producing the respective appearances calle "barreling" and "pincushioning;" and as this is most observable in, and most detrimental to the value of, copies of plans and charts, we may particularise it as "chart distortion."

Third.—We sometimes have a contraction of scale towards one margin of a picture, caused by the tilting of the camera. It is most frequently to be noticed in pictures including high buildings, the top of the picture having a contracted appearance, the result of an upward inclination given to the camera to enable it to embrace the higher objects. In copying a picture also this form of distortion may be produced, unless care be taken to have the axis of the camera so placed as to intersect perpendicularly the plane of the picture in the central point.

Fourth.—We have an undue width given to the high lights from their encroaching upon the neighbouring shadows. This is due to aberration of the lens and the use of too large a stop. The rays which are not brought to a perfect focus spread the effect of the strong light over a larger space. This distortion may be somewhat modified in magnitude by the length of exposure and the particular action of the chemicals employed.

Fifth.—We have that variety of distortion pointed out by Sir David Brewster as affecting the images of small prominent parts of a body when taken with a lens of large unstopped aperture.

Sixth.—We may note what, in some treatises on optics—as for instance Dr. Lardner's—is particularly called "distortion of the image," but this is perhaps better known by the better name of "curvature of the field."

It is to the two first varieties of these distortions that I mean to confine my remarks, viz., the portrait and chart distortions, and I shall chiefly dwell on the latter of these.

ON THE "PORTRAIT DISTORTION."

In the case of all pictorial representations into which perspective enters there is, for each picture, a certain point at which the eye should be placed in order that the apparent relative distances and magnitudes may be all correctly given. The truth of this, though known to all who have studied perspective, does not readily come home to us in a practical form, since the eye is so accommodating, or rather so little critical on this point, that a picture may be placed at a considerable range of distances from the observer without the ensuing incongruities of the perspective becoming offensive in amount. I speak thus in reference to the productions of our best masters in painting.

Another order of things, however, was established by the introduction of the quick-acting portrait camera, with its short focus, and the accompanying necessary proximity of the person to be operated upon to the instrument. Yet the distorted appearances which we find in the productions of such a camera, and which have in the public mind been attached as distinctive characteristics of photographic portraiture, are only exaggerations of a defect which is attached to every picture.

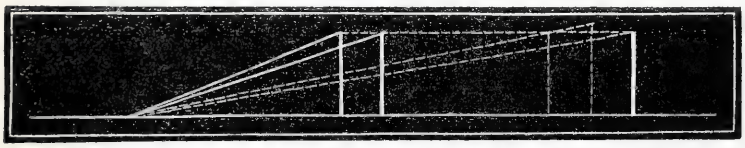
When a picture is looked at from the *proper point of view* the image in it of any object subtends the same angle at the eye as the object itself would do were it seen direct. But the error committed in taking photographs of near objects is, that the proper point of view for the photograph is at *far too short* a distance from it.

When a photograph is produced by a camera with a small unstopped lens, the proper distance at which it should be viewed to

see it in correct perspective is identical with the focal length of the lens. Now this distance is frequently not above a third of that at which the photograph would generally be held when inspected in the hand. But, not to exaggerate, I will, in the following examples, speak of this focal length or proper perspective distance of observation as six inches, and the distance at which the photograph would generally be held, when inspected in the hand, at double this, or one foot.

Let the objects of which we are supposed to take experimental photographs be two sticks or posts of equal and suitable lengths, placed five feet apart, measured in the direction of observation. Now let us first plant our camera at a distance of 100 feet from the further-off post, which we will consider the standard or undistorted

FIG. 1.



one. Let the angle subtended at the distance of 100 feet by this post be represented by a, then the angle subtended by the nearer post will be $= \frac{1}{95}^{0} - a$.

Taking a photograph of these with an unstopped lens of small aperture, it is evident that, when this is held at the focal length of six inches from the eye, the angles subtended by the imaged posts will be the same as if actually looking at the posts direct. But the photograph would not be so held: it would, we assume, be naturally placed at a distance of one foot from the eye, so that the angles subtended by the imaged posts will be reduced to half their former values,* or become $= \frac{a}{2}$ and $\frac{a}{2} \cdot \frac{1}{95}^{0}$. We have now to inquire into what change these altered angles represent, and we shall arrive at the apparent distortion or change, by arranging the actual posts so as to subtend these new angles at the eye; and this may be done in three different ways:—1st. We may double the distance of each post from the camera, putting one 200 feet off and the other 190 feet: the accompanying effect of this would be to lengthen out the distance at which they are apart from five to ten feet. 2nd. Retaining the distance apart of five feet, we must place the standard one at 200 feet off, and lengthen out the nearer post to a certain degree, ascertained thus:—The angles we would have if we did not lengthen the nearer post would be $= \frac{a}{2}$ and $\frac{a}{2} \cdot \frac{200}{190}$, and the angles we want are $= \frac{a}{2}$ and $\frac{a}{2} \cdot \frac{1}{95}^{0}$; so that the length to be added to the nearer post $= \frac{a}{2}\left(\frac{1}{95}^{0} - \frac{200}{190}\right) = \frac{1}{74} \cdot 2 = 0{\cdot}01344$, its length being taken as unity: the increase of length would therefore amount to only about $1\frac{1}{3}$ per cent. The third method of bringing about the change in the angles is by a partial adoption of each of the above expedients, and this, as we shall more particularly point out, is the actual change which the picture represents.

From the above example we see that for such objects placed at so great a distance from the instrument the amount of apparent perspective distortion is very trifling, and far less than what would be required to strike the eye. But let us now take a more trying example. Let us produce the photograph of the posts with the camera only ten feet from the further-off one; and let the angles under which they are seen direct, and their images seen at six inches off, be $= b$ and $b\ \frac{1}{5}^{0}$ or $2b$: these become in the photograph placed one foot off $= \frac{1}{2}\ b$ and b. To make the actual state of matters correspond we must—1st, either place the posts at the respective distances of twenty and ten feet; or, 2nd, placing the standard one at twenty and the nearer at fifteen feet distant we must lengthen the latter by an amount $= b - (\frac{1}{2}\ b\ \frac{20}{15}) = \frac{1}{3}\ b$, or $33\frac{1}{3}$ per cent. or, 3rd, we must so far make both changes that their combined effect will give the requisite change in the angle subtended at the eye by the nearer post.

The effect produced upon the eye by the two first alterations of the positions or lengths of the posts are identical, so that the eye alone is not capable (in so far as perspective is concerned) of judging between them, or saying in what degree either form of distortion exists to the displacement of the other; and the judgment really formed will be very much directed by the character of the picture, and the ideas respecting it pre-occupying the mind. We may venture, however, to say that, in the case of an ordinary picture, the idea of enlargement of the nearer objects will predominate over that of their exaggerated separation from the background, since this makes a less demand upon the power of calling up the idea of relief. In some stereoscopic pictures, on the other hand, where the idea of relief may be exaggerated, the nearer objects will actually appear diminished as compared with the background or more distant objects.

All that need be said in regard to obviating this form of distortion is merely to repeat directions which have already been given by others—to avoid taking a photograph of an object with the camera placed too near to it; or, when that is unavoidable, to use a lens of much longer focus than usual.

This form of distortion is peculiarly prominent in the case of portraits, but these are also liable to all the other varieties.

We now go on to speak of the absolute distortion of scale under the name of "chart distortion," as it is the great defect to which copies of pictures, maps, plans, charts, &c., are subject.

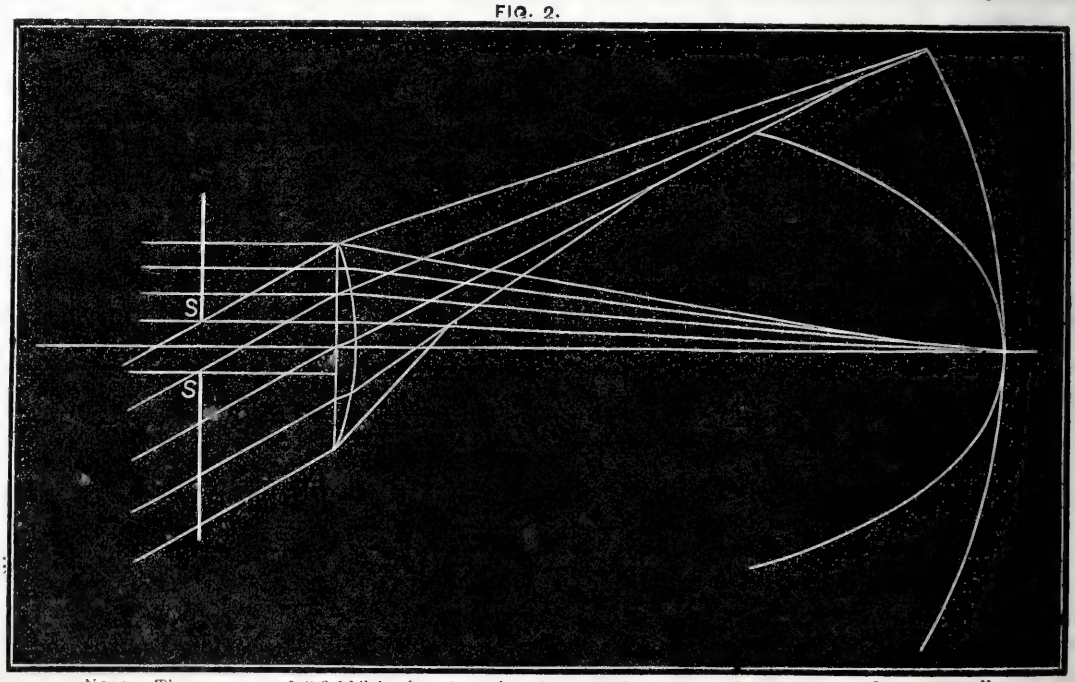
"CHART DISTORTION."

Plans and charts become worse than valueless when copied so as to have distorted scales; it is therefore a most important matter to free the copying as much as possible from this defect.

Believing that this distortion exists to a much greater degree than is generally thought, and that the usual combinations for copying are not so perfect as they get credit for, I trust the Society will excuse me for treating of the subject at considerable length, although not so fully and completely as I could have desired; but the subject is new to me, the calculations somewhat tedious, and the aid to be obtained from the ordinary treatises on optics very doubtful indeed. The chief information and the higher researches on the action of lenses are confined to the production of the most perfect image of an object seen under a very small angle of view, of which we may take the moon, or about half a degree, as the greatest; whereas what the photographer desires is an angle of 50 or 60 degrees, or more if he can get it. The questions are so different that one of the first proceedings of the photographic optician is to turn the lens exactly the reverse way of that directed by the astronomical mathematician, sacrificing fine definition at the centre of the picture for a more generally distributed though far inferior excellence.

The Origin of the Distortion.—If we were to take a copy of our chart by means of the rays passing through a pinhole, or by means of a very small lens of considerable focus, that copy would be free from the defect we are now considering: the various lines would

FIG. 2.



NOTE.—The more curved "field" is given by using the central part of the lens alone: the flatter "field" is obtained by placing a stop at S S.

* It is not strictly correct, but sufficiently so for the present purpose, to say that the angles become of half their former values. They really become such as to have tangents equal to half the tangents of the original angles.

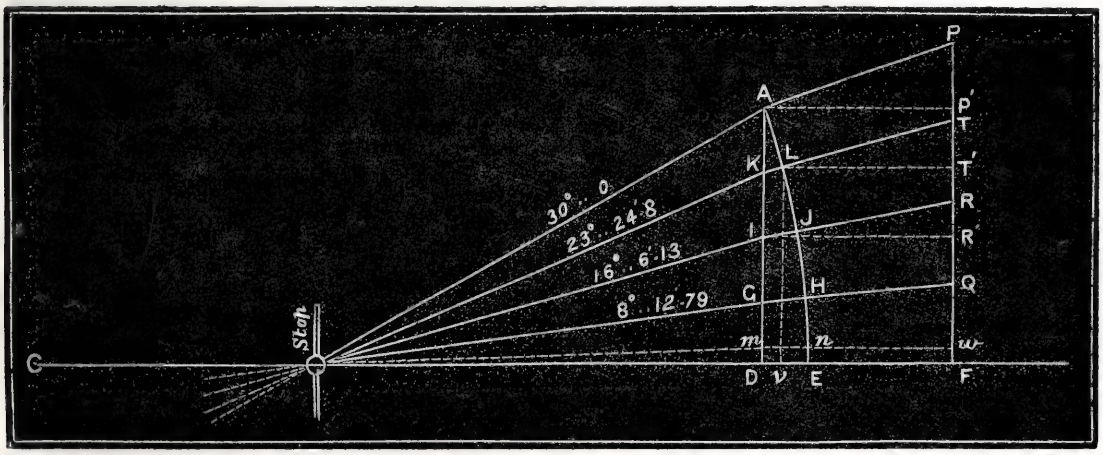
be more or less hazy and indistinct, but their positions and distances would be everywhere correct, according to the scale of the centre. The want of sharpness, however, in the best of such copies thus obtained, except when the size is very small compared with the length of focus of the lens, is so great, that we are driven from this simple to more complex arrangements in search of "flatness of field," or of such a condensing of the oblique and straight pencils of light as to bring them all to their foci in the same plane.

The diagram, *fig.* 2, exhibits the different foci for some pencils of light all at the same very oblique angle, but passing through different parts of the lens, and at once points out the use of a stop at S S, to cut or stop off all the rays which come to the shorter foci; and this device of a stop is the principal step in all arrangements for obtaining flatness of field.

Unfortunately the employment in this manner of a stop brings with it the evils of chart distortion; thus, in *fig.* 3, let A I = I D.

The rays O A and O I, coming from an object beyond the stop, would give a correct projection on the plane of A D; and therefore, in order that the image formed at P F may be correct, P R should bear the same proportion to R F which A I bears to I D, and it would do this approximately if the tangents of the angles of refraction were proportioned to the tangents of the angles of incidence, *i.e.*, if P P′ to R R′ were as A D to I D; but it is the sines of the angles and not the tangents which are proportionate, the consequence is that P F compared with R F is too small, or the ray O A P is too much refracted to give an undistorted image.

FIG. 3.



In calculating the distortions produced by the different lenses, and in comparing the effects producible by combining two lenses, one on either side of the same stop, it will greatly facilitate the operations if we assume certain rays passing the stop at definite angles; and perhaps the rays shown in *fig.* 3 are the most convenient for our purpose. The extreme ray is taken at thirty degrees with the axis of the lens, and the tangent to it, A D, is divided into four equal parts, so that the angles of the other rays are as marked in the figure. Taking A D as the unit of our dimensions, K D will be = 0·75, I D = 0·5, and G D = 0·25, also the distance of the stop, or O D will be = 1·732051. All the other dimensions, such as the radius of curvature, distance of object or image, &c., are to be referred to this same unit A D. All the lenses here considered are plano-convex.

The Unit of Non-Distortion.—The amount of the distortion will diminish towards the centre of the picture, the tangents and sines becoming there more and more nearly equal, and at the centre the distortion will be zero.

If we imagine a ray O *m* (*fig.* 3) to be exceedingly near to the axis, then the ratio which *w* F bears to *m* D gives us a standard by which to calculate the amount of distortion produced upon any of the radii, such as D G, D I, D K, or D A; and if we make the value which D A *should* possess in the picture at P F, if it were undistorted like the centre, equal to unity, the actual values of P F, T F, R F, and Q F, when compared with 1, 0·75, 0·5, and 0·25 times this undistorted value, respectively, will indicate the amount of contraction which each has undergone. The ratio which *m* D bears to *w* D when the ray O *m* is infinitely near the axis is $= 1 : \frac{D + \frac{1}{u} T}{R} + u\left(\frac{1}{u} - \frac{D + \frac{1}{u} T}{R}\right)$ or $= 1 : 1 - \frac{D + \frac{1}{u} T}{2R}$

where u = index of refraction, D = O D, T = D E, and R = radius of curvature of A E, and taking $u = 1{\cdot}5$, and since A D = 1, the value of our *unit* of non-distortion is $= 1 - \frac{D + \frac{2}{3} T}{2R}$

The courses of the four rays have been calculated for the various examples with considerable care, the effect of the thickness of the glass, &c., being taken into account. The index of refraction employed has been taken as usual = 1·5 for the sake of convenience, although a higher value would have been better.

(To be concluded in our next.)

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

CYANIDE OF POTASSIUM.

Synonymes.—Cyanuret potassium.
Composition.—K. C_2 N., or K. Cy.
Equivalent.—66.

Preparation.—Cyanide of potassium is formed in a variety of ways, as, for instance, when potassium is heated in cyanogen gas, or when the same metal is heated in the vapour of hydro-cyanic acid, or when nitrogen gas is passed over a mixture of carbonate of potash and charcoal in a porcelain tube heated to whiteness. These methods, however, of producing the substance are simply curious in a chemical point of view, and by no means suitable for its preparation on a scale suitable to meet the demand which exists for it. It may be prepared for use by passing the vapour of hydrocyanic acid into a cold alcoholic solution of potash, when the salt separates in a crystalline form, and may be dried by pressure between folds of blotting-paper. It is produced still more advantageously by the process of Mr Donovan, which consists in heating to whiteness in an iron vessel (preferably a mercury bottle) ferro-cyanide of potassium, which is converted by this treatment into charcoal, carbide of iron, and cyanide of potassium, the decomposition being accompanied by the evolution of nitrogen and other gases, which are conducted under water by an iron tube attached to the mouth of the bottle—the object of this arrangement being to obtain an indication of the completion of the process by the cessation of the escape of gas. The process, however, *par excellence*, by which this salt may be most economically manufactured for commercial purposes is the one devised by Baron Liebig. It is as follows:—Eight parts of ferrocyanide of potassium (*i. e.* yellow prussiate of potash) previously dried in a sandbath or by other suitable means, to expel water of crystallisation, are intimately mixed with three parts of dried carbonate of potash. This mixture is thrown into a red-hot earthen crucible, and is kept in a state of fusion, until gases cease to be evolved, and until the upper portion of the fused salt becomes colourless. This point may be ascertained by withdrawing a small portion on the end of a glass rod. On cooling it should appear quite white. The crucible is then removed from the fire, the contents stirred with a glass rod, and the clear portion poured off from the sediment, which is principally carbide of iron and iron in a minute state of division.

Properties.—Prepared as above, it appears in that condition in which it is generally sold in the shops—namely, as a hard white mass, having a crystalline fracture. It may be obtained, however, from its aqueous solution, in anhydrous octahedral crystals. It is very deliquescent in the air, and exceedingly soluble in water. A spirit containing sixty per cent. of alcohol, and having a specific gravity of 0·896, takes up at its boiling point a large quantity of cyanide of potassium, and conveniently allows nearly the whole to separate on cooling: this, therefore, suggests itself as a suitable method for the purification of this salt. A stronger or a weaker alcohol retains much more in permanent solution. Cyanide of potassium is readily fusible at a red heat, and without decomposition, if air be excluded: if this be admitted, however, the cyanide becomes oxidised into cyanate of potash. The aqueous solution of cyanide of potassium undergoes spontaneous decomposition, partly from the absorption of carbonic acid from the air and partly from the formation of formiate of potash; it is, therefore, *inexpedient to make too large a quantity of positive fixing solution at a time.* This salt is anhydrous, has an alkaline reaction, and *is very poisonous.* Though very fairly recommended by Liebig for use in

mineral analysis, as a powerful reducing or de-oxidising agent, this very property renders it altogether *unsuited for the fixation of negatives*, either on paper, collodion, or albumen, or for positive prints on paper; while, on the other hand, it is the *best fixing agent for direct positives* on glass. These remarks lead us now to a consideration of the uses of this salt.

Uses.—Cyanide of potassium is occasionally employed in photography for the formation of a small quantity of cyanide of silver, with the iodide in sensitive films: the propriety of this application is, however, somewhat questionable. Its principal use is as a fixing agent in the collodion process for direct positives on glass, for which, as above stated, it is especially applicable, for the following reasons:—The object aimed at, chemically speaking, in the positive collodion process, is to obtain, by development, a deposit of as *pure metallic silver* as possible, so that it shall appear of a pure frosty white by reflected light. It sometimes happens, however—through the improper employment of acetic acid instead of nitric acid in the development, and also through the imperfect or too prolonged action of the developer—that the silver goes down in combination with organic matter, and in a low state of oxidation, acquiring thereby an unpleasant yellow colour. The use of cyanide of potassium as a fixing agent under these circumstances goes far to correct this untoward result, owing to its strong affinity for oxygen and organic matter.

It will be seen, upon a little reflection, that the reasons which make it so suitable for fixing positives render it quite unfit for use in the negative collodion process. This will become still more obvious on perusing the remarks on the application of hyposulphite of soda in that process.

Impurities.—Prepared as above, directed by Liebig's process, cyanide of potassium is always contaminated with cyanate of potash though not to such an extent as to interfere with its use in photography, or with its more extensive application in the process of electroplating. The principal impurity in commercial cyanide of potassium is carbonate of potash, which sometimes exists in the proportion of 58 per cent. Some samples contain also iron and formiate of potash. There are three kinds of cyanide of potassium sold by chemists, in which the per-centage of pure cyanide is about as follows:—

No. 1.—Common cyanide contains about 42 per cent., and is sold at 3s. 9d. per lb.

No. 2.—Best fused cyanide, for electroplating, &c., contains about 92 per cent., and is sold at 7s. 6d. per lb.

No. 3.—Pure cyanide, crystallised from alcohol, contains about 99½ per cent., and is sold at 24s. per lb.

The prices given are of course merely approximative, and, subject as they are to continual variation, are simply quoted to give an idea of the comparative value of the three articles. Bearing in mind the application of this salt in photography to the removal of undecomposed iodide of silver from the *delicate* and *tender* collodion film, is it not marvellous that the preparation selected by photographers for the purpose should be the commonest and most inferior, containing more than 50 per cent. of carbonate?

Admitting that the carbonate of potash is inert as far as its chemical action on the xyloidin is concerned, it is extremely likely to cause the separation of the film from the plate by the softening action which alkaline salts exert upon such delicate textures. Moreover, the proportion of pure cyanide in a hundred parts is so variable that it is impossible to give a formula for a fixing solution which shall be applicable to every sample. The writer would therefore, upon chemical principles, earnestly recommend the employment of the salt numbered 3 in the above comparative list, which offers the advantage of being always constant in its character, without any serious drawback on the subject of cost, seeing that two grains will go as far as ten or twelve of that coarse preparation now so inappropriately applied to the refined operation of fixing a positive collodion photograph.

Tests.—The slight traces of cyanate of potash in the cyanide of potassium of commerce are so unimportant, photographically, that it is unnecessary to enter into the method of determining its presence. A brisk effervesence ensuing upon the addition of an acid to the solution of a salt under examination may be regarded as evidence of the presence of carbonate of potash. A yellow tint, possessed by the salt in the solid state, may be considered as indicative of the presence of iron; and a contamination by formiate of potash would be shown by a blackening of the salt on being heated.

Effect on Humanity.—Of all the preparations used by the photographer this is undoubtedly the most dangerous, on account of the extreme rapidity with which the fatal result supervenes on its introduction into the system, scarcely ever allowing time for the administration of antidotes. Moreover, its poisonous effects are sometimes produced by absorption into the body by contact with a cut or abrasion of the skin. A poisonous dose will produce, in rapid succession, a bitter cold taste—constriction and heat in the throat—insensibility, spasmodic respiration, the eyes fixed, pupils dilated and glistening—convulsions—spasms of the jaw and body—death.

A concentrated solution of the salt would possess such a corrosive action as to produce death by strangulation alone. Some idea of the highly poisonous character of this true *lapis infernalis* may be formed from a knowledge of the fact that two grains and a-half of the pure salt (numbered 3 in the preceding description) are equal to one grain of anhydrous prussic acid, or fifty minims of the acid of the London Pharmacopœia. It should be mentioned, also, that in cases of poisoning by this salt the breath sometimes has the odour of bitter almonds, owing to the production of prussic acid resulting from the decomposition of the salt by the acid juices of the stomach.

Antidote.—1. Let the patient inhale the vapour of ammonia—*i. e., spirits of hartshorn*—or drink a little sal volatile, diluted with *very little* water.—2. Pour cold water in a continuous stream on the naked head, neck and spine.—3. A weak solution of *protosulphate of iron*, or ordinary positive developer (if it do not contain nitrate of baryta or bichloride of mercury in excess), may be adminstered advantageously.—4. Stimulants also may be given if the patient can swallow them; but, whatever is done, must be done QUICKLY.

ON MOUNTING PHOTOGRAPHS.

By G. Wharton Simpson.

[Read at a Meeting of the South London Photographic Society, November 14, 1861.]

There are few things which contribute more to the general perfection of result in a picture than the mode in which it is mounted; and, as most photographers know, much of the permanency depends upon the adhesive material used in mounting. As but comparatively little attention has been given to this subject, I propose very briefly to devote a few words to the general question.

The first point to be considered will necessarily be that of trimming and shaping the print preparatory to mounting. In deciding the shape to which a print should be cut, whether rectangular or circular, oval, cushion, or dome, three considerations will weigh:—First as to how much of the print makes a good composition; second, as to whether the corners, &c., are perfect; and third, the general contour and character of the lines in the picture. No specific directions can be given regarding the first point: nothing but good taste and a knowledge of the laws of composition can guide the photographer in determining how the picture will gain by the retention or exclusion of an inch, more or less, of the subject in his negative. His technical taste will, however, readily guide him to the rejection of dark or ill-defined corners, unless, indeed, they aid the composition in some degree. I remember some one exclaiming, when examining some of Wilson's instantaneous sea pieces, recently exhibited as single pictures about 4½ by 3½, in each one of which the dark corners produced by loss of illumination and definition at the edge of the lens were present—"What a pity Wilson did not vignette these prints, or cut them oval or circular, so as to get rid of these dark corners!" "That," replied another gentleman, who knew Wilson, "would have entirely frustrated the intention in leaving them, which is to force the lights, and by contrast give brilliancy to the prints, as they are from very thin negatives." This is an expedient, however, which should rarely be used, and then sparingly. But it illustrates that there are occasions when power may be added to the composition from the retention of a dark corner imperfectly illuminated or ill-defined.

The best shape for the print will often be governed by the prevailing lines in the picture, and especially by the general character of the outline. Where a number of parallel lines, vertical or horizontal, prevail in the subject, an oval or circular shape will often materially help the picture, and prevent the formation of angles, which must become striking if the rectangular shape be adopted. On the other hand when the principal lines fall in curves, the rectangular shape will be most suitable. In no case, however, is a perfect square desirable. The oblong form should in all cases be chosen: whether the greatest length should be vertical or horizontal will be governed entirely by the subject.

It is never desirable, in shaping the print, to follow the outline, or principal lines of the picture. If the picture be vignetted, it will rarely look well cut to an oval, circle, or dome; the corners should

in almost all such cases be left square. The object should be to secure harmonious variety, and by the shape of the print to give the utmost value to graceful lines, or to distract attention from awkward forms. Another purpose may be sometimes gained by the shape of the print. It sometimes happens, especially in architectural subjects, that in obtaining a view of certain objects, it is immediately surrounded by others of less interest, which cannot be entirely removed without spoiling the picture. Where vignetting cannot be, or has not been, used to partially ignore these intruding elements, then the circular or oval form may be adopted with advantage, which, by cutting away portions of the objects not required, at once gives importance to the principal figure left alone in its integrity. These, of course, are but general hints, not absolute rules. I may here remark that except where the exigencies of the photograph imperatively demand it, on account of dark corners, &c., I think that the shape styled by photographers the "cushion" shape, should generally be avoided as meaningless and inelegant. In most cases where it is used the perfect rectangular shape would be much better. Where the corners are rounded, however, care should be taken to avoid a sweep which leaves it uncertain whether it is a flattened circle, an imperfect oval, or a cushion.

I may here add also one word more on the cutting out of card pictures. These are, of course, always best left rectangular. But it is an important point to remember that the due proportions of stature are chiefly indicated by the amount of space at the top and bottom of the figure. The size of the picture is generally from three inches and five-eighths to three inches and three-quarters long. As a general principle, the amount of background above the head should be from half-an-inch to three-quarters of an inch, and the space below the feet not more than a quarter of an inch. The exact amount will vary, of course, with the stature of the figure, but these remarks apply to a middle height. I may add also that it is a good thing to adopt a standard scale of proportion in taking such portraits, in order to give the pictures the value of suggesting truth in this respect. About half-an-inch for each foot in height would be found a good approximate scale for standing figures.

The best mode of shaping is to proceed as follows:—If the prints have been rolled up, and are, therefore, inclined to curl, roll them the reverse way on to a roller and leave them for a few minutes, at the end of which time they will lie straight. A thick piece of plate-glass cut to the required size and shape is the best guide, as it enables the manipulator to see exactly the position and amount of picture included. I may here describe a very good contrivance described to me a day or two ago by Mr. Samuel Fry, which he had made for cutting out the card portraits. It consists of a plate of copper with an aperture the size and shape of the photograph. At each corner of the aperture there is a slight slit, proceeding, both vertically and horizontally, a little into the copper, so that, in cutting, the knife passing into the slit cuts the corner of the print clean, which it would be somewhat difficult to do if the knife could only just pass up to the corner. A sharp knife or old razor may be used to cut with; and a piece of glass, or a piece of smoothly-planed lime-tree, to cut upon. The latter is most valuable, as it does not so readily dull the edge of the knife; and, unlike other woods, its grain and texture are sufficiently homogeneous to allow the knife to pass without the vibration which gives a ragged edge. The utmost neatness and skill in getting a clean cut edge, free from jaggedness, is imperative.

The proportion of margin is another subject on which the educated will be the best general guide; but upon which a few hints may be useful. Few things contribute more to give value to a print than a respectable margin; it is nevertheless by no means an uncommon thing to see very fine pictures spoiled by shabby mounting. Nothing would be more difficult than to lay down any absolute rule on such a subject; but a very fair approximation to a rule may be obtained by deciding that the margin on the sides should never be less than one-third of the breadth of the print, and that on the ends not less than one-third of the length.

Under some circumstances the proportion of half the breadth for the side margins and half the length for the ends will give a good result. But I have heard this principle objected to by persons of taste, as tending to formality and stiffness; it being urged that all proportions consisting of parts of even numbers tend to that formality. I have heard some attempt to establish a principle based on the analogies of musical science; but I fear that it would be difficult and unsafe to lay down definite rules on a subject which must largely be governed by feeling and educated taste.

A very excellent effect is produced by a narrow margin of india-paper immediately around the print, or of what is now commonly used as a substitute, a tint produced on the mounting board by lithography, in imitation of india-paper. This tint often gives great value to the whites of the photograph, and general relief to the tone of the picture. In some cases a good effect is produced by leaving a somewhat larger margin at the bottom than the top. In card portraits, for instance, it is better to leave about half-an-inch at the bottom, and about one-eighth of an inch all round. In all cases it is desirable to avoid intersecting corners; that is, a line drawn diagonally through the mount should not intersect the corners, first of the india-paper tint and then of the print. Where the corners thus intersect the effect is inevitably formal.

The next point for consideration is the best adhesive material, and the best method of using it. A great variety of materials has been recommended for this purpose, amongst which gum, dextrine, paste of various kinds, gum-glue, india-rubber, &c., have been chiefly used, and each has had its advocates. I do not propose to enter into any extended discussion of their respective merits, but just to offer one or two remarks on the subject.

The qualities necessary in any such material are, that it should be easy to prepare, easy to use, efficient when used, and free from deleterious effect upon the photograph. Gum has the disadvantage, if thin, of sinking into the paper and showing into the face of the picture. It has, moreover, the tendency to rapidly turn acid, and if used in this state it injures the photograph. Making it with boiling water reduces the tendency to acidity or decomposition; and if made thus, and used sufficiently thick, I think it may be used without disadvantage. Dextrine I have not used, but I believe there is no positive objection to its use. Of the various kinds of paste that made of starch is preferable, and if used fresh is, I believe, perfectly safe. I prefer the patent starch, in powder and without the blue tint, for my own use. I may here describe a simple and efficient method of making it. I take a teaspoonful of the powder and put it into a common marmalade jar; this is then mixed with the smallest quantity of water, which will make it into a thick paste. When it is rubbed perfectly smooth, boiling water is poured on it, the whole being rapidly stirred. Sufficient boiling water is used to make a thick transparent jelly, and one good teaspoonful of the powder will make a jarful of paste. This will keep good a few days in summer, and longer in winter. It is easily made, easily used, efficient, and will not, if used properly, injure the photograph.

Glue, gelatine, isinglass, &c., are used by some. Of these I think good Scotch or Russian glue will be found best. This, for persons only mounting occasionally, will be found troublesome to prepare and use, but it is very efficient, and, I believe, safe.

I may here refer with advantage to some experiments undertaken, and detailed to the Photographic Society of Scotland a few years ago, by Mr. Colin Sinclair. His object was to determine the effect upon the permanency of the print exercised by the various materials used for mounting. I will read one or two extracts from his report:—

"I prepared a small quantity of each of the substances already named (starch, albumen, isinglass, and gum-arabic) in separate dishes, and selected two of Mr. Tunny's photographs, one of them of the brown tint on albumenised paper, the other of the black tint on plain paper. I cut each of the two prints into five pieces, the fifth piece being laid aside for future comparison, and then distributed the four pieces of each picture over the four dishes containing the different materials, so that there were two pieces completely immersed in each dish. They were kept there for one month.

"I would have allowed them to remain longer in this state, but the pieces became so fragile that I could hardiy remove them from the liquids in which they were immersed. After cleaning the pieces, I mounted them along with the fifth piece, so as to show the relative effects on each, and I now lay the mounted results before you.

"It will be observed that the brown photograph on albumenised paper has suffered the most, especially the piece that was immersed amongst the albumen. It has given way very much. The pieces that were amongst the isinglass and the starch are slightly affected; that which was in the gum is the least changed of any; while the black picture on plain paper has come out of all the four different substances much the same as it was."

Conceiving that it might be more satisfactory still to test the keeping qualities of pictures mounted with these materials, he took two other photographs and cut them each into five pieces, mounting four of the pieces, each with a different material, and keeping one piece unmounted for comparison. These mounted pieces were then placed in a damp cellar, where all the conditions generally considered averse to photographs were present in an exalted degree, and kept there for twelve months. At the end of that time they were submitted to the Scotch Society. I will read a brief extract from the report. Mr. Sinclair says:—

"The fifth piece, lying on each cardboard in juxtaposition with the mounted pieces of the pictures, shows the original colour, from which it will be observed

that the whole tone is somewhat changed, but still indicating the superiority of the starch and the gum-arabic for mounting photographs.

"In the first experiment—that of steeping—the plain paper photograph, of a black colour, was less changed than that on the albumenised paper; but the result is reversed in the two mounted pictures—the one on plain paper, of a brown colour, being more injured than the other. This may be partly accounted for by the black coloured picture having been a stronger print. The four photographs thus tested had been well washed with warm water, otherwise they could not have withstood the treatment so well as they have done, as is evidenced by the third picture in the hands of the members, which, from its tone, did not appear to have got justice in the washing, and was only about a fourth of the time in the cellar along with the others.

"As regards convenience of application, I prefer starch when mounting photographs, as it can be used with greater facility and cleanliness than gum-arabic, which, however, is very useful for an occasional picture, as it is inconvenient and not worth while making fresh starch every time an amateur requires to mount a few pictures."

From these experiments it would appear that Mr. Sinclair found starch and gum the most conductive to the well-being of the photograph. My own predilection is in favour of starch, simply because I have found it so easy to prepare, and because, as it will not keep, it must be prepared fresh; there is not, therefore, the same temptation to use it when unfit which there is when a bottle of gum is kept for occasional use. I have heard the objection used to starch that it might generate acid even after the picture is mounted. I have no fear, however, that the dry particles of starch, by which my prints are made to adhere to the mounting-board, will produce me either sugar, alcohol, or acetic acid.

There is, however, another consideration which, under some circumstances, will influence the decision as to the adhesive material to be selected. There are two sources of trouble in mounting to which I have not yet adverted—curling and cockling. The cause of both these troubles is this: the print on being coated with paste or gum becomes saturated with moisture and expands, it is mounted on the board in this expanded condition, and as the moisture evaporates it contracts again to its original size, or even less, and draws with it the board on which it is mounted. Where there is a margin of board all round the print, "cockling," or uneven contraction, often results. It will readily be seen that those substances which contain the most moisture, such as gum or starch, will produce those evils in the greatest degree. Where the pictures are mounted with a margin, this is an important consideration, and for this purpose it will be found that glue causes the least trouble. In using it the print does not expand much, and there is consequently little contraction. The curling, &c., may also be obviated by sponging the mount before laying down the print, so that both shall be equally expanded. The plan described some time ago by Mr. Stuart, of Glasgow, is also a good one for preventing this defect. Each print is covered with starch paste before trimming, and then dried. When they are to be mounted they are trimmed and shaped, the board slightly wet, and the print placed upon it in position, The two are then passed through a lithographic press, which brings them into firm contract and completes the operation.

I may here mention a little hint which will be found of great service to those who have large numbers of card pictures to mount. When the prints are very stiff and dry much, it is difficult to cover them with the starch, without their curling up and smearing the surface. To prevent this take a clean sponge and damp a few dozen before pasting them, they will then lie perfectly flat, and cause no difficulty. Although this involves two operations it will be found an actual saving of time.

I will, in conclusion, just refer to the use of india-rubber paste. This is scarcely suitable for general mounting purposes, but is invaluable for fixing prints in albums or scrap-books. A slight touch of the paste at each corner attaches the print to its place in the scrap-book, and keeps it perfectly flat, without the slightest contraction or "cockling." The paste is made by dissolving shreds of india-rubber in chloroform or benzole.

I now invite inspection of a variety of specimens I have brought to illustrate my remarks, and add, that the bulk of them, all those with the India paper tint, were mounted by Mr. Fox, of Little Britain, whose neatness, skill, and taste in mounting generally I can commend in the highest terms.

I have not said anything here of hot-pressing or rolling, but I may conclude by observing that I consider it indispensable to perfect results.

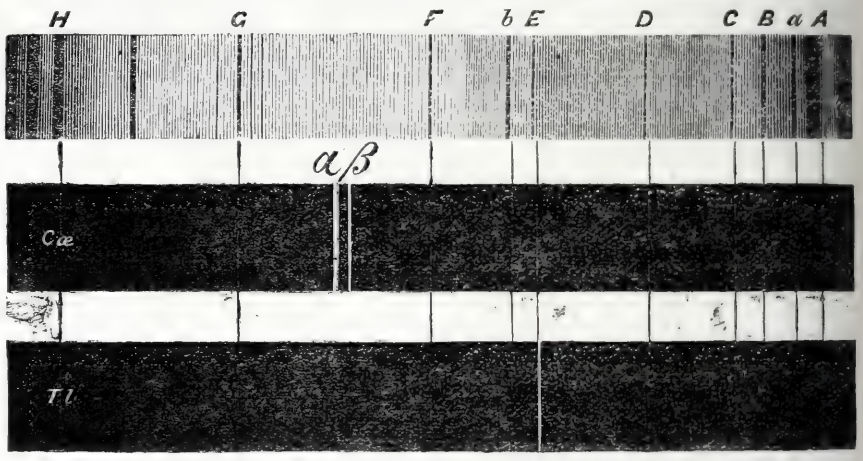
THE CONSTITUTION OF THE SOLAR ATMOSPHERE AS REVEALED BY SPECTRUM ANALYSIS.

By Samuel Highley, F.G.S., F.C.S., &c.

(Concluded from page 384.)

By means of the spectroscope three new elementary bodies have been added to the list of those previously known. Bunsen and Kirchhoff have discovered two of these, viz., cœsium and rubidium, both belonging to the group of alkaline metals, while Crookes has discovered an element belonging to the sulphur group, which he has named thallium.* Cœsium is distinguished by two blue lines *a* and *b*, shown in *fig.* (2)—rubidium by magnificent red lines †—and thallium by a single delicate green line in the position indicated in *fig.* (3).

By the method of analysis described in these articles the photographer is enabled to detect the nature of an iodiser, if it be an inorganic compound; but an organic body usually defies detection, though in some cases it declares itself, if Gladstone's method be resorted to. Dr. Miller has recently discovered that photography lends its aid to the spectrum analyst; for, on receiving the image of certain spectra on a sensitive collodion film, lines existing in the ultra-violet were delineated that were not visible in the ordinary way, unless, indeed, they were received upon a fluorescent screen. On comparing the diagrams made by Dr. Miller sixteen years ago with those of the spectra of the same bodies recently photographed by him, it will be seen that great additions have been made to the portion beyond H.‡ Hitherto we have chiefly spoken of the characteristic *bright* bands; but certain coloured gases and vapours produce spectra equally characteristic, but wherein the bands are *dark*—in fact analogous to the lines of Fraunhofer previously spoken of; for instance, the vapours of nitrous acid, iodine, bromine, &c. These dark bands may be readily seen on placing before the slit of a spectroscope a tube about nine inches long, with its ends closed with plates of glass, and filled with the vapour of nitrous acid, at the same time allowing solar light to pass through the tube. The numerous bands may be increased in number and intensity by increasing the length of the tube or the temperature of the vapour. The lines in this case will not be found to have corresponding lines in the solar spectrum if the two be examined in juxta-position as described at page 383 of this Journal. If, on the other hand, we introduce the vapour of sodium in the path of solar light on its way to the spectroscope, we shall find that a *dark* line occurs coincident with Fraunhofer's line D. Now it will be recollected that, when soda was volatilised in a Bunsen's burner or other flame, a *bright* yellow line presented itself, likewise coincident with the line D. Whence this mutual coincidence? It has been found that bodies that, in a state of incandescent vapour, *emit* particular rays have the power of *absorbing* the same rays emanating from other incandescent bodies. This may be demonstrated in the following manner:—If a beam from an electric lamp be allowed to fall upon a prism, a *continuous* spectrum will present itself upon a screen placed in a proper position. If the positive pole of the lamp be now moistened with a solution of chloride of sodium, the well-marked bright line will present itself in the yellow space of the spectrum: this *defines the position* we wish to experiment on, but the result would be the same were we to omit this precaution. If, now, we place a small



* See *Phil. Magazine*, April, 1861.

† See *Phil. Magazine*, November and December, 1861.

‡ See *London Review*, No. 66, p. 437.

piece of sodium in a platinum capsule, and heat it over a gas burner placed between the lamp and the prism, as soon as the sodium begins to burn and give forth vapour the bright yellow line is immediately obliterated and replaced by a dark one. If, in a similar manner, volatilised lithium, strontium, magnesium, calcium, &c., were introduced in the path of the beam, each elementary vapour would obliterate its own system of bands from the continuous spectrum, and thus produce an effect similar to Fraunhofer's lines. This experiment is the keystone to Kirchhoff's theory of the constitution of the solar atmosphere, and the explanation of the cause of Fraunhofer's dark lines, which has for so long been a vexed question among philosophers; but, as Gladstone has recently pointed out, this theory must be received *cum grano salis.**

Kirchhoff's Theory is to the effect that the sun is an incandescent nucleus, which, *per se*, would afford a continuous spectrum, but that it is surrounded by a flaming atmosphere of elementary vapours which absorb those rays of the nucleus which they themselves emit; consequently, if the solar nucleus were to be extinguished or removed, we should have a bright coloured band in the place of every dark line of Fraunhofer's. These lines, therefore, are not absolutely dark, but dark by an amount corresponding to the difference between the light of the nucleus intercepted by the photosphere and the light which issues from the latter.

As Tyndall phrases it, this theory "has been nibbled at" by many previous investigators of spectrum phenomena, among whom stand prominently Miller, Angström, and Fourcault.

To determine the nature of the elementary bodies that are present in the atmosphere of the great luminary upon which photographers are so greatly dependent, it is, in the first place, necessary that we should attain to a very accurate knowledge of the solar spectrum and its dark lines; and, in the second place, of the bright spectra of the individual elements. But it is confidently stated by Kirchhoff that we are at the present moment in a position to assert that potassium, sodium, magnesium, iron, nickel, and chromium are present, while silver, copper, gold, lead, tin, and antimony are absent from the photosphere.

These spectrum observations palpably open up a new and wide field for research in terrestial and stellar chemistry, which must ever lead onward to a more intimate knowledge of the constitution oft he solar atmosphere, and to which photography will lend its assistance

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. X.

Before entering into the next part of my subject I have anothe remark or two to make on distortion, which should have been in cluded in my last paper. I believe it will be found that in every picture in which distortion occurs the evil is always greater when a large stop is used than when a small one is employed on the same subject, and, further, if any objects situated near the margin are somewhat out of focus, the mischief with a large stop is still more glaring and obnoxious.

As the results of photographic operations are influenced by very trifling causes, being delicate, requiring great care in the manipulation, and considerable judgment in directing them, so as to avoid waste of time and material as well as disappointment and chagrin, it is of the highest importance to be able to determine with great accuracy the conditions by which success and *certainty* may be achieved—such as the size of stop, focal length of lens, intensity of light, condition of chemicals, &c. No doubt it is pretty generally known that the quantity of light which passes is in proportion to the square of the diameter of the aperture in the stop. But this rule does not indicate exactly the *practical* proportions of the acting power of light in its results when different sizes of stops are used, or, in other words, the results are not produced in time exactly proportional to the squares of the diameters of the apertures. Take, for instance, one-inch and half-inch diaphragms: the one-inch ought to produce a result in one-fourth the time of that of the half-inch; but, instead of this being so in practice, the half-inch will do it in three times instead of four times that of the inch.

If we compare a quarter-inch with the half-inch and one-inch by the same rule, the quarter will be three times that of the half, and nine times that of the inch; or, with a two-inch stop, it would be twenty-seven instead of sixty-four times. These variations from the rule I account for by stating that, when a small stop is used, the light is concentrated more accurately to a focus than when a large one is employed. In these cases I am, of course, supposing the focal length to be the same in all of them.

I consider photography quite in its infancy yet; and one of the greatest wants to be supplied in bringing it to maturity is a lens or combination which will require no stops, having such an intensity of light as to take any sort of picture instantaneously, and whose pencils shall be so attenuated as to define with the greatest sharpness either near or distant objects simultaneously. I may be derided for harbouring any such expectations; but I quite believe they will yet be effected, notwithstanding the *apparently* insurmountable difficulties. I cannot conceive that this object will be gained so as to be generally practicable by extreme sensitiveness of the chemicals, as, supposing such to be discovered, I believe that pictures taken therewith would be fogged, in consequence of the amount of light by which it is needful to work; for, even with the faintest light, and that of a reputed non-actinic colour, some effect must be produced on an extremely sensitive film, and that of an injurious character.

With regard to the proportions of the times of exposure for different focal lengths, the rule is that the times of exposure are in proportion to the squares of the focal lengths. I do not think this rule *exactly* correct in practice; for, of two focal lengths, one half that of the other, the shorter one will take the same picture, all other circumstances being the same, in about one-fifth instead of one-fourth the time of the larger one. This I attribute to the same cause as that mentioned in connexion with stops, viz., the more accurate concentration of the rays to a focus with a short focal length than a longer one.

In changing from one focal length to another, or from one size of stop to another, or using any size of stop or focal length as may be needed, it is very useful to have some criterion to judge by or calculate from as to the time of exposure required under any given conditions. My criterion or standard of reference for portraits or views is that when the sun is shining in the middle of the day in summer or winter, as the case may be, with the atmosphere perfectly clear, and no cloud in the sky—or, if any, white, and few of them: I take a picture or two under these conditions, with a lens of such focal length and size of stop as I have most frequently in use, and note the time. The next degree of the acting power of light is when the sun is not shining, but yet a clear bright day, with white fleecy clouds in the sky. The time of exposure in this case, when taking portraits in a room, is not much more than when the sun is shining—say about one and a quarter that of the "standard." In taking a view in the open air under the latter conditions the time will be about three times that of the standard. The second degree of the power of light I calculate on is when the sky is covered generally with sombre-like clouds, intermixed with some of a more or less light hue—what may be called dull. In this case I find that the time of exposure is from two to three times the standard in taking portraits in a room; but with views it will take from six to nine times the standard. The third degree with portraits will take from four to six times the standard—that is, when the sky is covered with dark or leaden-hued clouds, an idea of which may be comprehended by the term "very dull." I will not attempt to indicate any time under these conditions for views, as I consider it a waste of time, and unwise to attempt to take them under such circumstances; for I am convinced that good views cannot be so obtained, except, perhaps, in some cases when all the objects are near.

I merely give these approximate data as a kind of guide-point in a sea of uncertainty and conjecture; for it is somewhat temper-trying to have to take a picture two or three times over, in consequence of being a little wide in one's calculations, or guesses, as to the time of exposure. There are, of course, several causes which influence the time of exposure beside the lightness or dulness of the day; as, for instance, the colour of the light, the state of the chemicals, the temperature of the weather, &c. The colour of light I spoke about in a former paper; and perhaps it may be sufficient here just to remind the reader that whenever the light is of a yellow, red, or even green tinge, it must be taken into account in connexion with the time of exposure, because its actinic power varies greatly under such circumstances. These matters, to old practitioners, may seem trifling, and anything but novel, but to some, and particularly those who have not studied the nature and properties of light in relation to actinism, they may be of considerable service; and, as uniformity and certainty is a desideratum much needed in photographic operations, it cannot be a waste of time to discuss anything which may be the means of contributing to that desirable result. Perhaps if I give an example or two they may be the means of bringing about a clearer understanding

* See *Proceedings of the Royal Society*, Vol. XI., p. 305.

of the subject by some who may not be well up in these things than all I have written before.

First Example.—Suppose, then, I take a picture in twenty seconds, with a lens of ten inches focus and one inch aperture, that is the criterion or "standard of reference."

I wish to take another picture double the size, and, of course, with a lens of double the focal length, with the same aperture, and under the same conditions of light. What must the time of exposure be?

As $10^2 : 20^2 :: 20'' :$ $\quad 10 \times 10 = 100$

$20 \times 20 = 400 \times 20'' = 8000 \div 100 = 80''$ ans.

Thus the second picture would require 80″, according to the rule; but in practice it would require 100″, as before explained in this paper.

Second Example.—I want a picture taken with a lens of five inches focus, same aperture as before, and light the same. What must be the time of exposure?

As $10^2 : 5^2 :: 20'' :$ $\quad 10 \times 10 = 100$

$5 \times 5 = 25 \times 20'' = 500 \div 100 = 5$ ans. by rule, but by practice 4″.

Third Example.—Same as last, except that the aperture is half an-inch instead of one inch.

As $\frac{1}{2}^2 : 1^2 :: 4'' :$ $\quad \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

$1 \times 1 = 1'' \times 4'' \div \frac{1}{4} = 16$ ans. by rule, but by practice 12″.

Fourth Example.—Same as last, except that this is taken in the first degree of light in a room, whereas the last was taken with the "standard" light. What the time of exposure?

Then $12'' \times 1\frac{1}{4} = 15''$. Thus this picture, taken with a five-inch focus, half-inch aperture, and first degree of light, would have three-quarters the exposure of the "standard," under its conditions of focus and stop.

STEREOGRAPHS.

Instantaneous Views of Paris.

London Stereoscopic Company, Cheapside, London.

Instantaneous photographs of street scenery are, it must be admitted, as superior to those taken by ordinary exposure as living animals in a menagerie are to stuffed specimens of the same kind—the bustle and animation of the scene in the former case being retained in all its exciting stimulus, while in the latter a sense of desolation always more or less prevails. These instantaneous views must be of immense advantage to artists in arresting and recording, for their future benefit, the actual attitudes of numerous figures in varied phases of movement—one of the most difficult feats at which an artist aims. Take, for instance, one of the most satisfactory of the series now before us, No. 38, the Boulevard de Strasbourg, in which we find a couple of men standing for a gossip together at the street corner, one with folded arms, the other with the right hand resting on the hip, and suggestive of a regular cosy chat. Most of the passengers are sauntering along, though here and there one or two are seen in evident haste:—one gentleman has his right leg poised in mid air, while advancing quickly towards the spectator; another is evidently running across the road, for, rapid as the exposure has been, a portion of the right leg is blurred, and, to some extent, so also are the spokes of the wheel of a phaeton just whirling round the corner. A man with a basket walks lazily across the road, and one with a truck has stopped to rest, leaning against it with his legs crossed. A huge block of stone, drawn by four horses, is evidently heavy—for notice how the animals strain at the collar. These are only a few of the more prominent figures: there are numbers of others, each in its turn worth studying. There is a little snowiness of effect due to the brilliancy of the sunshine and shortness of exposure; but the subject is unusually picturesque for one of modern street architecture.

No. 44, Rue de Rivoli, is an excellent companion to that previously noticed. Numerous examples of the advancing legs of the pedestrians are observable, including those who "slouch" along—those who turn out the toes, and consequently the knees, somewhat grotesquely—and those who move as nature, not too much sophisticated, dictates. While the preceding scene was taken from the sunny side, this is from the shady side of the way. Both are excellent examples of their class.

No. 40, Rue Montmartre, is of a more quiet character, but still including many figures. In the foreground is an omnibus, with the conductor standing in the doorway, and three passengers on the double-seated roof; a hooded phaeton is retreating in company with the omnibus, and also a laden cart still further ahead. At the kerbstone, on the left, stands a woman selling something contained in a basket suspended in front of her, much as one of her English sisterhood would arrange it; and midway along the right-hand side is a man in pretty brisk movement, with his hands up to his mouth, apparently bawling out something for the edification of the neighbourhood. What a pity we cannot photograph the sounds also! Though an excellent slide in other respects, it is rather under-exposed for the shadows, where unfortunately most of the figures are congregated—a predominance of very white caps, waistcoats, shirts, &c., testifying to this assertion.

No. 42, Boulevard des Italiens is another capital illustration, the chief features of which are to be sought in the road traffic, consisting of carriages, omnibuses well laden, drays, water carts, and vehicles of every description, including their human and four-footed appendages.

No. 34, Fontaine St. Michel.—In this slide the very unpicturesque incident of the greater part of the road being "up," apparently for sewer construction, mars the subject as a picture, and the passengers are either in a greater hurry than those seen in the other specimens, or the exposure has been more prolonged, for there are many with only one leg, or say a leg and a-half, the remainder having been "lost by movement."

No. 41, Boulevard Montmartre.—There are two specimens of this slide, both numbered alike, and indentical, except in the passengers included therein: both are somewhat spoiled in consequence of "blacking out the sky," interfering sadly with the outline of the upper parts of the houses; but, as studies of people in motion they are capital. In one, two labouring men are carrying a heavy package suspended between them, the tense muscular action from head to foot in both being admirably portrayed: they form also a striking contrast to the quiet repose of an old woman seated under one of the trees knitting, and the leisurely promenade of several gentlemen taking it very easily—one young man alone, who is approaching towards the spectator, appearing in any hurry. In the other specimen, if there be less unity and harmony of composition, there is more variety. A consequential individual in military uniform, including very "peg-toppy" trowsers, is strutting towards the observer, and beside him a civilian is walking—as a civilian should do; two ladies, with parasols, are partly seen beneath the sun-blind of the shop on the left, while two men in blouses are walking on the other edge of the *trottoir* in an opposite direction; a third is carrying a parcel on his shoulder, and a gentleman is running along the edge of the kerb-stone; a shopman is standing outside his door looking down the street, apparently directing the attention of a pedestrian, who is approaching him obliquely, to something in the distance. But we must call a halt: it will never do to go on describing a whole streetful of passengers, however much we feel interested in them.

Subjects of this class will always be popular, and deservedly so; for, though they may not contain much of a high artistic value, they cannot fail to appeal to human sympathy and curiosity.

PHOTOGRAPHIC COMPETITION.

By John Thomas Brown, Jun.,

Honorary Secretary of the Birmingham Photographic Society.

On reading the characteristic remarks of Mr. John Cramb upon the above subject, in your last number, I determined, as perhaps the more dignified course, to allow them to pass without comment; but, having an evident tendency to mislead your readers, and impugning, as they do, the character of the judges upon whom the responsibility of the award devolved, I am in duty bound to set the public right, and, by explaining a few facts, remove the imputation.

In the case of the Birmingham Exhibition, the medals were awarded by Sir Francis E. Scott, a gentleman who occupies an important position in the world of art, if not as a *practical* photographer—though in the latter capacity he held the office of President of our Society for one or two sessions. In connexion with his general knowledge of art, his *social* position would, of course, place him above even the suspicion of unfair dealing; but, coupled with his own, I am sure the name of his coadjutor, Dr. Anthony, would meet with the approval of every competitor. As to the competency of the latter gentleman, it would be presumptuous on my part to offer any comment: his scientific and artistic acquirements, as well as his long and intimate *practical* connexion with photography, are highly appreciated by those acquainted with the art, and wherever it is practised; and, therefore, I believe that no appointment could have been made more satisfactory to the general body of photographers, or more beneficial to the interests of the art itself.

No other complaint, or even the least reflection upon the competency of the arbitrators or the fairness of their decision, has yet reached me; and I therefore can only accept the remarks of Mr. Cramb as both ill-advised and not over charitable.

I must request Mr. Cramb to explain the grounds for his statement—that "the Exhibition, both as regarded quantity and quality, was the most meagre ever opened—*a defect attributable to the past conduct of the Society.*" It is almost superfluous to state that we opened up a new feature in photographic exhibitions, by offering medals for the best enlarged pictures from the solar camera; and the paucity of the competition in this class arose from the absolute want of sunlight to enable the operators to use the instrument.

Further comment upon Mr. Cramb's almost impracticable suggestions is uncalled for. I think he has quite failed in his attempt to elucidate the subject, either of competitions or awards generally. In the instance in point, the Birmingham Photographic Society laboured under every disadvantage that could possibly stand in its way; and, if the Exhibition has fallen short of producing that satisfaction and interest in the mind of Mr. Cramb and others that was intended by its promoters, I can only say that a part of the *onus* reverts to that gentleman himself, with others, the presence of whose productions would have greatly increased the *quantity* and, perhaps, the *quality* of the Exhibition.

A few remarks on the instantaneous stereographs and moonlight views of Mr. Breese, remarked upon by Mr. Cramb, at the City of Glasgow Society's meeting of the 7th ult., are perhaps necessary.

I think the best refutation of Mr. Cramb would be practically to test the powers of *instantaneous exposure* at his command, and therefore suggest a comparatively easy subject for him to operate upon—say an object under the *combined* influence of *rotary* and *progressive* motion, as the wheel of a cab; or, to place the matter more under the control of his own studio, I should be content with an impression of the "gyroscope" *in motion*. If he will honestly keep a register of the number of his *failures*, and forward it with the best stereographic image he can obtain, I shall have much pleasure in submitting it, side by side, with any of the works Mr. Breese has *already* produced, and have no fear that those of the last-named gentleman will suffer by comparison.

The views of the Queen's visit to Birmingham, alluded to by Mr. Cramb, were produced some *four* years ago: his more *recent* ones are not considered worthy of notice. The inference, therefore, is, that Mr. Cramb either was actuated in his remarks by some personal bias or was not a sufficiently competent judge of their relative merits. Had he seen the *Power's Court Waterfall*, or others which *must* have escaped his attention, he could not but in fairness have admitted that they are *unsurpassed* even by the works of M. Ferrier.

As to the moonlight views, I trust, with Mr. Breese's sanction, shortly to prove, before a thoroughly qualified tribunal, that they are what they pretend to be, *instantaneous views* of the *moon* (that is, *instantaneous* in so far as such an exposure can be obtained by a simple removal from and replacing of the focussing-cloth over the lenses of the camera); until which time Mr. Cramb must rest, if he can, in the disagreeable position he has thought proper to assume.

I may, in conclusion, state that Mr. Breese is an *amateur*, practising photography simply for the *love* of the art, and without any hopes of making a gain by it. He has already gone far ahead of any *professional* in the production of *instantaneous* stereographs; and I feel convinced that such unpleasant remarks as those of Mr. Cramb, though they may stimulate him to increased exertion, yet are calculated to leave anything but a favourable impression on the mind of a sensitive individual as to the class of men who occasionally act as the self-appointed judges of works they evidently cannot appreciate.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By John Cramb.

No. XI.

Intensity of Light in Syria—Preparations for Visiting the Dead Sea and the River Jordan—Bedouin Escort.

The last part of my "notes" left me in Jerusalem. I now propose to give a brief account of my visit to Jericho, the Jordan, and the Dead Sea. Before doing so, however, I will answer a question that has been often put to me regarding the actinic power of the light in eastern countries.

Photographic friends have generally expressed astonishment when I have assured them that I found the light in Palestine to be exactly as intense, photographically, as it looked. Gentlemen writing from India and elsewhere, where the bright light would lead one to expect short exposure, have bewailed the actinic feebleness of the light in warm climates. That always seemed to me extraordinary, though not impossible. In all calculations of the comparative power of actinism at different times, in the same place, the want of a constant measure—a reliable actinometer—has been felt. It is so much more felt in attempting to estimate the strength of light in places far removed and under very different physical conditions otherwise. Philosophical research or observation was not the object of my visit to Palestine. I was not specially equipped for such, even if I had been disposed to undertake it, and capable of doing so successfully. But so far as careful observation made in carrying out the purely practical purpose of my visit can avail in settling this question, I must unhesitatingly declare the light to be of the same quality, photographically, as one meets with in this country. I could easily see how a wet-collodion operator — working under a burning sun with the atmospheric temperature at perhaps 100°, as I had during my journey for months, and, perhaps, with old decomposed English collodions, obliged to use an almost unbelievable amount of acid in his developer and his silver bath too—might have very much longer exposures than he could get good pictures with in the old country under more favourable conditions. But no one capable of forming an opinion on any philosophic question would receive such a trial in evidence on the question of the comparative intensity of the light in the two countries. My plates, albumenised in Glasgow and silvered in the same bath as I had used at home, had only to be washed in a *similar water* to that I had used in Scotland to be a pretty fair test of the strength of the light if the development were the same. Any other dry process would be the same. As I have elsewhere observed, the purpose of my visit to the Holy Land was purely to get pictures of places interesting from Scriptural associations, and there was nothing in it to induce me to try very short exposures, far less to attempt making instantaneous pictures. From my experience there, however, I have no doubt it would be very easy to get instantaneous pictures. Without at all making any effort to do so with short exposure, I seldom exposed longer than two minutes with the ½-inch stop on the 15-inch Ross lens, and more than once I made good pictures with fifteen seconds' exposure.

The conclusion I wish my readers to draw is, that I found no difficulty with the light in the East. When it seemed bright it was so. Every photographer knows how many other evils are covered by *full* exposure to good light. The quality of the light in Palestine is the same as in England: you have plenty of it, and scarcely ever know there is such a thing as fog or mist. Generally the air is so free from moisture that objects miles off are as sharp and *intense* as those in the immediate foreground of the picture. There is, generally, no atmosphere; for the artist's atmosphere is not air, but water. The mere photographic enthusiast, who desires clear definition alone throughout his entire picture, will have his utmost wish satisfied in such countries as Palestine. Planting his camera on the top of any house about the centre of Jerusalem, and turning his lens toward Olivet, how delighted he will be to find the Church of the Ascension as clearly defined and as intense in shadow as the roof of the next house, though in reality some two miles distant!

Every traveller and pilgrim who visits Jerusalem has a wish to see the Dead Sea and the River Jordan, and nearly all make it convenient to gratify the desire. The usual plan for Frank travellers is to make a three days' journey of it. The first day they go to the Convent of Mar Saba, passing on the way through Bethlehem; and, if they have not previously been to the "City of David," to "do it" then. The second day they go from Mar Saba to the Dead Sea and the Jordan, and encamp for the night at or near Jericho. On the third day they return to Jerusalem. Some again reverse the order and go to Jericho the first day, and so on inversely. Before I left Scotland I had been informed of the serious difficulties that lay in the way of my visiting the Plain of Jericho at the season of the year when I would be in Jerusalem, and my instructions permitted me freely to leave that undone, or to employ the Jew photographer at Jerusalem, if he would be more able to endure the heat or more willing to brave the dangers of the journey. I had, however, made up my mind from the first, if it were possible for me to see the Dead Sea and the Jordan, that I would be willing to risk a little both of life and property in carrying out the desire.

The Dead Sea is about 3,000 feet below the level of Jerusalem, and the whole Plain of Jericho is about the same level: it is, consequently, at all times very much hotter than at Jerusalem—how much I found impossible to ascertain without experience, but all agreed as to the greater intensity of the heat. It was generally from

75° to 85° in the shade at Jerusalem just before I purposed making my trip to the Dead Sea. Travelling during the night obviates the danger and uncomfortableness of the great heat, but that would not suit a photographer who wished to take views as he went along; and, besides, it would be impracticable, from the risk incurred. And that brings me to the second difficulty in the way of any one going to the Dead Sea and the Jordan—the well-known dangerous character of the inhabitants of the country through which the traveller must pass, and the still more dangerous and thievish propensity of the people of the country to whose borders he approaches at the Jordan. I learned that one way of getting over this was to obtain an escort from the Pasha at Jerusalem, which is easily obtained for a trifling sum. Though that would look well enough on paper, or even while marching out of Jerusalem, I was assured by Mr. Finn, Her Britannic Majesty's Consul at Jerusalem, it would just be the way of insuring my being robbed, if not murdered, before getting back to the Holy City. The only safe plan we learned was to place ourselves under the protection of a chief of the scoundrels themselves. Earlier in the season, when there were many travellers in Jerusalem, I was informed that parties of ten or twelve persons generally went together, with a Sheikh of the Jordan Bedouin tribes—as their guide nominally, but really as their protector.

Having made all preliminary investigations, and finally decided on going, I published my intention throughout the Holy City. There were very few travellers, and fewer still disposed to risk their heads under the burning sun of the Plain of Jericho, or to consign their persons and property to the tender mercies of its tawny inhabitants. Ultimately I found two reverend friends willing to share the dangers of the journey. Long before I had made up my mind about when or how I was to go, I was waited upon by a Sheikh of the Jordan, as he called himself, who assured me he would guarantee the safety of my property, and, if anything was lost, restore it fourfold, though he assured me it was quite impossible that such could ever take place under his protection. Those whose opinion I was disposed to trust informed me that this Chief was the "right man in the right place." Let the reader realise the picture. The day before we proposed starting, one of my clerical friends and myself were sitting in the British Consulate, and under the shadow of the royal standard we made a contract with the Bedouin Rob Roy, Sheikh Salih Abun Sere. He promised security to person and property, and we promised in return so many royal mint medallions, bearing the effigy of Her Britannic Majesty. There was no document drawn up. Sheikh Salih gave his word—and was he not a gentleman? He saw the money put into the Consul's hands, to be delivered to him on our safe return.

I had determined on leaving out Mar Saba and going the nearest and most direct way to the Dead Sea. After consulting with our guide, I decided on trying to do the whole in two days, taking the greater part the first day. For the more easy accomplishment of all we proposed, I resolved on making a very early start. As usual, our muleteers were of a different mind. It was nearly five o'clock before they arrived—fully an hour after the time we had hoped to be beyond the walls of Jerusalem. We left by the St. Stephen's Gate, rode down into the valley of the Kedron, passed the Garden of Gethsemane, and took the camel road to Bethany, where we had arranged to meet our Bedouin guide, that being as near Jerusalem as he cared to be except in full daylight. There his country begins, and, consequently, there ends any little of law and protection of property which the Turkish government, in its feebleness, is able to maintain.

Winding round the south-western shoulder of Olivet, we had a fine view of Jerusalem. Again and again we turned and admiringly gazed on it, but we were compelled to hurry on. Soon we passed Bethany. How quiet and lovely it looked in the soft light of an eastern morning! I resolved to come over again, and, perhaps, many times; and very reluctantly we followed our dark-eyed guide down the steep stony path that led to Jericho. We had, by advice of Mr. Finn, left our revolvers at home. We were quite unarmed, and had alone to depend on the protection of our Bedouin Chief. I had some dim notions of a large number of attendants being a necessary concomitant of chieftainship: our Chief had but one follower. The Sheikh was well mounted, but totally unarmed: the attendant was on foot, and carried a long gun and a sword. This was all our warlike equipment, if I except the four-and-sixpenny pistols of my Maltese dragoman, which, however, I observed he had stuck in his belt in as defiant a manner as he could. We soon left the Jericho road, as we proposed going to the Dead Sea first. About an hour and a half below Bethany we turned off to the right, and took a more southerly direction. There was no road there—not even a trace of one. Our guide became light-hearted and cheerful as he seemed to feel he was out of all traces of what we call civilisation. My reverend friends commented on his Ruffianship, as the American minister called the Sheikh. I cannot say that I liked him *then;* but I dared not call him bad names. I had elected to trust him. I did do so implicitly, and if he fulfilled his contract he was no scoundrel. So far as my connexion with him went, he was an honest man—a true gentleman. It was astonishing how soon this untutored son of the desert fathomed our thoughts, though he know no word of our language. I trusted him, and never regretted it: my friends were obliged to take his protection, but called him bad names in a language he knew not. He read our thoughts in our faces as well as if we had spoken in words he understood.

The first object I proposed taking a picture of was the place which Moslem tradition has fixed on as the tomb of Moses. I do not believe it is so; but, as I was to pass it, I thought I might as well have a picture of the building—nearly the only remains of buildings in that part of the country. Neby Musa is about an hour and a half from the Dead Sea, up in the wilderness of Judea. That was our first resting-place, and we arrived about one o'clock. While the horses of the remainder of the party were resting I was at work with my camera. Soon after leaving this we were in sight of the Dead Sea. Far below us there it lay, and every eye was strained to take in a vivid picture of it. I was already, as we rode along, speculating on where I was to take *my view* from. Down the steep precipitous path we ride on, keeping our eyes, whenever we could, on the glistening distant lake. Hitherto we had felt no intolerable heat: at Neby Musa the thermometer stood at 92° in the shade. As we descended it got hotter.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

HARMONY *(continued)*—THE COMPOSITION OF LINES AS ELEMENTS OF HARMONY—POWER OF LINES IN AIDING HARMONY IN THE EXPRESSION OR SENTIMENT OF A PICTURE—QUALITIES COMMON TO THE VARIOUS LINES—OF SPHERICAL, STRAIGHT, AND CURVED LINES IN COMBINATION — ILLUSTRATION OF HARMONY IN THE COMPOSITION OF LINES—ILLUSTRATIONS SELECTED FROM HOGARTH'S "ANALYSIS OF BEAUTY."

"To produce an agreeable effect, *every part* must bear a varied and proportionate relation to all the rest."—*H. Howard, R.A.*

"Fitness of parts to the design for which every individual thing is formed, either by Art or Nature, is first to be considered, as it is of the greatest consequence to the beauty of the whole."—*Hogarth.*

"The most harmoniously beautiful outline is that which approaches more or less nearly that of the ellipsis. The curve or the circle is excess—the straight line is deficiency—the ellipsis is the degree between."*—*Haydon.*

"Forms of most grace have least of the straight line in them."—*Hogarth.*

"When you do dance, I wish you
A wave of the sea, that you might ever do
Nothing but that: move still, still so,
And own no other function."—*Shakespeare.*

"So varied he, and of his tortuous train
Curled many a wanton wreath in sight of Eve,
To lure her eye."—*Milton.*

"As to *lines*, I know of none that may not be graceful, elegant, and beautiful in proper circumstances and situations, and none that are not the reverse when employed improperly."†—*Payne Knight.*

MY DEAR FELLOW-STUDENT,

Having considered subordination, truth of light and shade, expression, contrast, &c., as productive of harmony in their artistic combinations, we shall now, if you please, turn to an element of no less importance to the production of harmonious effects, viz., that which is to be found in the selection and composition of lines.

And here I can imagine some sceptical lover of the easy and mechanical exclaim—"selection and composition of lines! Why how can we select and compose when we are obliged to take them just as they come?" To such, you, my dear fellow-student may briefly reply—for it is not worth while to waste many words on such a benighted being—"by selecting lines which compose;" after which reply most probably your scornful inquirer will turn away muttering something about "all that *bother* and *trouble* for getting a something which after all *he* don't see the value of," which being very true, let him go, content that his ignorance excuses his indolence, although both, like nearly everything else that is mean, unworthy, and ignoble, have their origin in that love of ease which does not sound quite so well when called by the more forcible and, to my thinking, more truthful appellation—*laziness.* And now let us proceed to business.

* Curves vary. Haydon refers to those which more nearly approach the spherical.

† As the reader will see, I agree in the main, although not altogether, with the sense of this quotation. I do not think certain lines can ever be made, by any treatment, "graceful, elegant, or beautiful;" but I do believe that the most beautiful may be destroyed "when employed improperly," as my present letter is intended to demonstrate.

The boundary lines of vision, technically called *outlines*, are of the utmost importance in a picture's composition; but, however lines are formed—whether they be positive outlines, or simply lines indicated by the position of forms, or the grouping of lights and shadows—they are no less objects of careful consideration. I shall more fully explain this when treating of lines, but our present object is the consideration of such as elements of harmony.

As I have hitherto allowed one branch of our study to glide gently into some other nearly akin to it in purpose, character, and effect, suppose we now take up the consideration of *lines* as aiding in the *expression* or *sentiment* of a picture—harmony of expression having been the last subject of my previous epistle.

Now, the sentiments or feelings associated with straight or angular lines are perceptibly different from those suggested by circular and curved ones. In the square we recognise rude simplicity, strength, solidity, and uniformity or equality; in curves we have motion, gentleness, delicacy, and subordination; and in the circle we have, to some extent, a combination of the qualities of both, although with a very decided leaning towards those of the curve. Thus—as we may point out by way of illustration—in the figure of a man, more rudely simple in its outlines as compared with the refined and variable contours of the female form, we have frequent repetitions of the square, and more nearly angular abruptness in its variations, while in woman the gently swelling lines glide smoothly one into the other and are in the most harmonious accordance with her gentleness, amiability, delicacy, and gracefully subordinate character. To perfect the illustration spherical surfaces are to be traced in the contours of either form, although most frequently in those of the woman. But here we have only one of the great harmonies by which Nature unites the material to the spiritual world. The philosopher might give you them in hundreds.

In further illustration, however, let us remember how commonly we associate ideas of strength and power with angles and squares, and how almost invariably we find objects of universally admitted beauty made up of graceful undulating lines. In the Hercules, as representative of physical power, we have the massive squareness of jaw and shoulders, the abrupt swellings of huge muscles, the head, well supported by the thick column-like neck, standing squarely up, and the general appearance that of massive angularity and squareness. Again: does not architecture show how straight lines and right angles are the types of stability and strength only, and that to make them unite in harmony and beauty we must combine with them, as the very elements of such qualities, the spherical and the curved. Thus a series of straight columns have their unity in the arches which unite them as parts of a whole, and their straight vertical lines are beautified with the curved ones of their capitals.

Dr. Darwin attributed the pleasing character of the sphere—fancifully enough—to the fact of its being the form of the maternal breast, so precious to the infant; and somebody else—even more fanciful than the good doctor, thought the fact was accounted for,—in common, perhaps, with "the milk in the cocoa-nut"—by that of the world being round. But I venture to think a still more satisfactory reason may be found in the absolutely perfect unity and harmony of its parts, unity and harmony being the chief component portions of all beauty. The peculiar expression of a sphere is largely dependent upon the position it occupies and the use it serves. In the swelling contours of infancy it seems in perfect harmony with the simplicity and innocent purity of the infant, while it is no less harmonious when, in forming the mighty roof of some huge cathedral, it emulates that glorious dome, "fretted with golden fire," the orbed expanse of heaven. In ancient Assyrian and Egyptian art a winged orb signified eternal wisdom; and even now the circle is used to shadow forth both wisdom and eternity. It has also been used as the symbol of kingly power, and of the universality of Christianity. Lines then having, as parts in a picture, their own individual expression, good taste tells us that such should be in accordance with the expression of the whole, for the sake of *power, unity, harmony*, and their resulting *beauty*.

Let us now, passing over (just to serve our present purpose) the more varied denominations, consider lines as separated into three divisions—viz., straight, circular, and curved—and glance at them separately as our elements of harmony in their combinations.

Circles blend very harmoniously together, but do not do so in close combination with angles.

Curves are also harmonious in all their infinite variety, but, when directly opposed to straight lines, they are said to be out of harmony.

Straight lines also blend in their associations, but do not mingle harmoniously with the curved or serrated lines.

Compositions of lines which are complete in their parts are also harmonious in their combinations.

To obtain contrast and variety, then, and not miss harmony, is the aim to be adopted in our practical studies of lines.

To glance at the unity of variety in lines, let us take a beautiful Greek statue, from time immemorial the type of harmonious beauty. What variety and contrast do we perceive, and yet how every part aids the expression of the whole! The contours are a succession of delicate curves, undulating in "wave"-like, "wanton wreaths," from the delicate flexions and flowing lines of the neck and shoulders to the no less smoothly graceful boundaries of the extremities. Look at the eye!—

> "Where is any author in the world
> Teaches such beauty as a woman's eye?"

See how the *curved* lid, so suggestive of the *drooping sweep of the* lash, contrasts the *circular* lines of the iris or pupil, the *convex* brow, and the *oval* orbit! Then trace the bolder, yet perfectly delicate, curve of the ear, the flow of the undulating locks of hair, the gently swelling rotundity of the lips, the playful hollow separating them from the rounded chin, and the perfect oval circumscribing the face; and here we have such a lesson in the harmonious combinations of lines as should not easily be forgotten. Well might the poet sing—

> "From Harmony—from Heavenly Harmony—
> This universal frame began;
> From Harmony to Harmony,
> Thro' all the compass of the notes, it ran—
> The diapason closing full in man."

It is said that Raffaele changed his taste in lines from studying some such specimen of Grecian art as I have described, and, from a stiff, formal manner, became, in his glorious works, a most eloquent advocate for curvilinear and serpentine outlines.

Hogarth points out, in his famous "Analysis of Beauty," how in the pine apple, the shape of which partakes of the *oval* and the *cone*, the outline contrasts harmoniously with the serpentine lines, and with the cavities and round prominences of what gardeners call the pips. Of this branch of composition, in the same work, he says:—"The way of composing pleasing (or harmonious) forms is to be accomplished by making choice of variety of lines, as to their shapes and dimensions; and then again, by varying their situations with each other by all the different ways that can be conceived; and, at the same time—if a solid figure be the subject of the composition—the space or contents that is to be enclosed within those lines must be duly considered, and varied, too, as much as possible *with propriety*. * * * Nature, in shells and flowers, &c., affords an infinite choice of elegant hints for this purpose; as the original of the Corinthian capital was taken from nothing more, as it is said, than some dock-leaves growing up against a basket. * * * St Paul's Cathedral is one of the noblest instances that can be produced of the most judicious application of every principle that has been spoken of. There you may see the utmost variety without confusion" [that is to say, harmonised], "simplicity without nakedness, richness without tawdriness, distinctness without hardness, and quantity without excess—where the eye is entertained throughout with the charming variety of all its parts together. The noble projecting quantity of a certain number of them, which present bold and distinct parts at a distance when the lesser parts within them disappear—and the grand few but remarkably well varied parts that continue to please the eye as long as the object is discernible—are evident proofs of the superior skill of Sir Christopher Wren."

And here, my dear fellow-student, we will once more pause; for my lamp burns dim, the fire is nearly out, and the church clocks are giving to the frosty air their varied voices in the solemn sound of One. More of Harmony in the next epistle from yours, faithfully,

ALFRED H. WALL.

BIRMINGHAM PHOTOGRAPHIC EXHIBITION.

AWARD OF MEDALS.

Silver—Best Portrait ..... A. Claudet, London.
Bronze—Second Best Group ..... H. P. Robinson, Leamington.
Silver—Best Landscape ..... F. Bedford, London.
Bronze—Second Best Landscape.. Vernon Heath, London. / James Mudd, Manchester.

In this class the judges recommended two Bronze Medals to be given—placing Mr. Heath and Mr. Mudd.

Silver—Best *untouched* Solar Picture Mr. Owen Angel, Exeter.
Bronze—Best coloured do. do. Mr. John Turner, / Stafford Street, Birmingham.

Sir Francis E. Scott gives an extra prize to Mr. O. G. Rejlander, of Wolverhampton, for his works generally; and the judges recommended the Society to give an extra Bronze Medal to Mr. Breese, for his instantaneous stereographs.

Notes of the Month.

Great events or startling discoveries in photography now but seldom disturb the "even tenor" of its steady progress, and all eyes are naturally turned to the coming Tournament of 1862. The Exhibition building itself is making almost marvellously rapid progress. The appointment of Mr. Le Neve Foster (a member of the Council of the Photographic Society) to the management of the Photographic Department, is a guarantee that we shall not have an uninterested or ignorant *chargé d'affairs*. Mr. Foster has just returned from the Exhibition at Florence, and, doubtless, brings with him many hints which will be of value, both for adoption and avoidance in the arrangements which he is now commencing. The names of Mr. Foster's colleagues are not yet made known, but they will consist of amateurs chiefly distinguished by their social position.

The Memorial of the Great Exhibition of 1851, by Mr. Durham (another member of the Council of the Photographic Society), is rapidly progressing towards completion, and will, we have little doubt, be ready for inauguration soon after the opening of the Exhibition of 1862—though, probably, casts of three of the figures around the pedestal will have to do duty at first for the bronze statues. Mr. Durham has had the courage and forethought to try the effect of the crowning figure of the Queen as "Peace" in its future position—one of the happiest, perhaps, it has ever been the good fortune of a modern sculptor to secure—ere finally dismissing it to the caster's hands, and has considerably altered and improved it. This was the practice of the ancients, and it would be well if the same practice were followed by modern sculptors more generally. It is impossible for a sculptor working at a colossal model in a confined studio or shed to guess accurately its correct appearance at a vast height above the ordinary level of the eye, and in an open space.

The last number of the *London Review* contains an excellent article on photography as a fine art. Terse, logical, and vigorous in style—calm and dispassionate in tone—it should carry conviction to any mind still halting between two opinions. In the beginning of the controversy we directed attention to the importance of defining terms. We are glad to see that the writer dwells upon this point, and also upon the incongruous place the photographic pictures will hold if enumerated in the Industrial Catalogue. The concession of a separate department, on the ground that photography is an art *sui generis*, will be nullified if this be the case. As there will be but two catalogues, the photographs must necessarily be placed in one or other of them. The public neither know nor feel interested in the question, and photographs coming before them in the mechanical catalogue will help to associate in their minds for ever the art with all other mechanical contrivances.

The writer of some "Papers on Physiognomy," in the *Cornhill Magazine*, ascribes the want of trustworthy portraits as one of the main causes that have retarded the science, and he trusts that, henceforth, photography will adequately supply that want. With such portraits, and engravings of portraits, as we have had, it has been utterly impossible to get beyond the nebulous science of a Lavater. We required the photograph. The physiognomist cannot be independent of portraits. Living faces are not enough for him. For the purposes of comparison he needs marked characters and picked specimens. Though it is a hard thing to say, portrait painters, however great, "are unreliable." Most of them have a mannerism. In the upper lip—a most important feature—they are quite untrustworthy. Raffaelle had a favourite lip, without which he hardly ever painted a face. So with Kneller and Fuseli. "Sir Thomas Lawrence gives it with a vengeance to all his sitters—curling the curves, and making the little drops in the centre almost drip. Nothing short of the photograph can correct this uncertainty and make the physiognomist feel that he is on sure ground. The photographs produced by such men as Mayall, Dickenson, Lily, Watkins, Williams, and others, leave little to be desired: nothing more truthful and nothing cheaper. A collection of good portraits is now within everybody's means, and everybody is making a collection. Let us hope that something will one day come of these numerous collections."

Anent "Photography in Natural Colours," M. Niépce de St. Victor is said to have succeeded in fixing the coloured image so as to be capable of resisting four-and-twenty hours' exposure to light.

By the death of Mr. Clarkington, of Regent Street, another of the few remaining early Daguerreotypists is lost to the photographic world. Having travelled with success throughout the South of France, he afterwards practised photography in the Strand, and ultimately in Regent Street, where (possessing one of the best appointed glass-rooms in London) he became known for his successful portraits of theatrical celebrities. S. T.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

An ordinary meeting of the above Society was held on Wednesday evening, the 20th instant, at Myddleton Hall, Islington,—George Shadbolt Esq., Vice-President, in the chair.

The minutes of the last meeting having been read by the Secretary, and confirmed by the meeting, the Chairman called on Mr. Ross, who had kindly undertaken to exhibit a complete set of apparatus for taking pictures by means of Mr. Sutton's patent panoramic lens.

The whole apparatus was neatly packed in a case, measuring about 36 in. by 18 in., by 18 in., and furnished with divisions to keep each piece of apparatus in its place in travelling. The size of the pictures yielded by the lens was 12 in. by 4 in., embracing an angle of 100 degrees, and the cost of the whole was stated to be £22.

While displaying the individual pieces of apparatus, as camera, lens, bath, pressure-frame, &c., to the meeting, Mr. Ross took occasion to remark that the essential difference between this and the usual apparatus for landscapes was, that everything in this was *curved*. The glass plates upon which the pictures were taken were made expressly for the purpose, and cut from cylinders blown to such a diameter as to suit the curve required by the lens. This being the case the bath, camera, back, plate-holder, pressure-frame, &c., must necessarily also be curved; and, with regard to the last-mentioned piece of apparatus, he directed attention to the fact that no plate-glass was required upon which to place the negative, the negative itself being placed in the frame. A gentleman present having alluded to the risk attending such a method of printing, Mr. Ross stated that Mr. Bedford had taken as many as 60 or 70 impressions from one negative without breaking it.

Mr. Moens directed attention to the disadvantage of using gutta-percha baths, which, as he imagined, could not be avoided in this instance, from the necessity of having the vessel curved.

Mr. Ross expressed a hope that he should, ere long, be able to supply curved glass baths, as he was then negotiating with a manufacturer with that object in view. He had stated that ebonite would be *too brittle* a material, as he had been using a tray made of it, and, having accidentally let it fall, it broke into a thousand pieces.

Mr. Simpson and Mr. Ross, in reply to a question as to the coating of the curved glasses with collodion, bore testimony to the fact that they had found little or no difficulty in the operation.

The Secretary mentioned the want of a flexible transparent material as a substitute for glass, and regretted there should be such difficulty in procuring plates of mica of uniform thickness and free from striæ and scratches.

Mr. Simpson stated that one objection to the use of mica was that it contained iron.

Mr. Garnham thought the waxed-paper process a convenient one to follow when using the panoramic apparatus.

In reply to questions from various gentlemen, Mr. Ross stated—1st. That the focus of the lens was five inches, measured from the *centre*. 2nd. That the curved wood-work was cut out of the solid, and clamped to prevent warping. 3rd. That the lens certainly required focusing, as the aperture was large in proportion to the focal length of the lens. 4th. That its chief use was in taking a particular class of subjects, consisting of extended views, &c. Some remarks were made relative to the curvature produced in the lines that should be horizontal, &c.

An animated discussion then followed on the form of shutter adapted to the front of the camera in lieu of a cap to the lens.

Mr. Dawson advocated the use of a black cloth in front of the lens as being quite as instantaneous as the arrangements then before the meeting.

Mr. Ross replied that he was aware that the plan alluded to by Mr. Dawson was adopted by some of our first photographers, as, for instance, Messrs. Negretti and Zambra, in taking their Crystal Palace stereographs, and Mr. Wilson, of Aberdeen, in his sea views. He submitted, however, that the hinged shutter (now under notice), opening and shutting by means of a milled head, or by raising it with the finger, possessed the advantage of allowing the operator to regulate the exposure with greater nicety, and also to direct the actions of the light with regard to the sky or foreground of the picture for a greater or a less time as occasion required.

Mr. Dawson, without desiring to disparage the instrument in any way, must object to its being called an instantaneous shutter, as it possessed no advantages over black cloth.

Mr. Simpson was of opinion that the shutter would act as a screen to the sky better than cloth: anything at a given distance from the lens would shade the sky.

Mr. Seeley had observed, in practice, that a stop had always the effect of cutting off the corners of the picture.

The Chairman explained that anything in front of a lens would act as stop *or* object. If it were so close to the lens as not to act as an object, it would then perform the part of a stop. He proposed a vote of thanks to Mr. Ross and the gentlemen who had taken part in the discussion, and called on Mr. Martin to read a short paper *On Simple Dried Collodion without a Preservative Agent* [see page 417], which he had undertaken to do for Mr. Hislop, who was unavoidably absent on that evening.

Mr. Martin, before reading Mr. Hislop's paper, exhibited two stereographs taken by that gentleman, and sent by him to illustrate the capabilities of his dry process without a preservative agent. He mentioned

also the collodions used and the times of exposure; but these were points which could not be appreciated without an examination of the pictures.

The discussion which followed the reading of the paper was characterised by a singular misapprehension on the part of most of those who engaged in it; for, whereas Mr. Hislop distinctly stated in his paper that *he claimed nothing as new*, but desired only that the Society should participate in the satisfaction he had himself experienced at having worked out an easy and efficient mode of operating, it was repeatedly stated that there was "nothing new" in the process—a fact already fully admitted by the writer of the paper.

Mr. Simpson said he had obtained pictures by simply washing the nitrate of silver from the sensitised collodion film.

Mr. Dawson said that the finest dry collodion pictures he had ever seen were some taken by Mr. Sparling, and shown to him in Dublin, and they were taken upon plates which had been simply washed and dried after removal from the bath; moreover they were kept for one month before exposure, and for one month after, before they were developed. He (Mr. Dawson) further said, in reply to questions from Mr. Seeley and Mr. Bingham, that there was no sign of the film leaving the plate during development, nor had any peculiar form of developer been employed.

The Chairman said Dr. Hill Norris had adopted a similar method of preparing plates in 1854, and Mr. Barnes had subsequently done the same; this, however, to his mind, was a point of less importance than the view taken by Mr. Hislop, with reference to the supposed inert condition of the albumen used in coating the plates before pouring on the collodion. He (the Chairman) was satisfied that the nitrate of silver came into direct contact with the albumen in virtue of its complete penetration of the collodion film, and had no hesitation, therefore, in regarding the albumen as playing an important part in the formation of the picture.

Mr. Dawson described a simple experiment by means of which any one might convince himself of the complete penetration of the nitrate of silver through the collodion film. On one occasion he inadvertently placed a sensitised plate in his camera back with the wrong side inwards, and he found on developing, after exposure, that by *reflected light* from the surface of the film no picture was to be seen, but on looking through the glass a picture perfect in all its details became visible, clearly demonstrating that the actual image was on the under side of the film, *i.e.* the side in contact with the glass.

Mr. Bingham remarked, in reference to the question whether the albumen was really coagulated by drying before coating the plate with collodion, that the point might be ascertained by treatment with water.

Mr. Martin stated that he had mentioned that point in his conversation with Mr. Hislop, further suggesting that, if through the non-coagulation of the albumen any portion should dissolve off on treating the plate with water, evidence of its presence might be obtained by the addition of a few drops of solution of nitrate of silver, or bichloride of mercury, which would produce a white, cloudy precipitate, if albumen were present.

Mr. Simpson said it was well known that dried albumen was not coagulable by heat; the evaporation of the moisture, when plates so coated were dried in an oven, prevented the coagulation.

The Chairman stated that Mr. McNab, of Glasgow, who was in the habit of employing diluted albumen as a preliminary coating to his plates, found that, if kept for any length of time prior to use, they were apt to become mouldy in some places, causing spots in the picture—thus tending to show that the albumen was not coagulated. He (the Chairman) suggested to him the immersion of the plates in a solution of protosulphate of iron to coagulate the albumen, and this was found entirely to prevent the defect complained of.

Mr. Martin mentioned the fact that Capt. Dawson, of Trichinopoly, had adopted the use of protosulphate of iron with equally satisfactory results.

Mr. Simpson alluded to the importance of being furnished with a collodion which would adhere to the plate for a process like that of Mr. Hislop's.

Mr. Martin said that there were some collodions which, while adhering to the plate in a very satisfactory manner, had the singular property of parting with their nitrate of silver in a very unequal and patchy manner, notwithstanding the most careful and complete washing: he thought it especially important to avoid such a collodion for working the process now under consideration.

The Chairman thought the non-adhesion of the film not so dependent on the character of the collodion as on the surface upon which it was poured, as he had found that almost any collodion would adhere if the plate were first coated with albumen.

Mr. Seeley was of opinion that gelatine would do better than albumen, as it had less action on the bath than albumen.

The Chairman said there was no doubt that gelatine had less action than albumen on the bath.

Mr. Moens mentioned that temperature materially influenced the rapidity with which albumen affected the bath. He had sensitised albumenised paper at a temperature of 110° Fahrenheit, and had found the bath solution turn black in half-an-hour.

Mr. Simpson directed attention to the fact that Mr. Hislop recommended the employment of acetic acid, doubtless with the object of assisting the coagulation of the albumen; and when that plan was followed with a paper bath, the discolouration spoken of by Mr. Moens was slower in making its appearance.

A vote of thanks to Mr. Hislop was proposed and carried unanimously.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The second ordinary meeting of the above Society was held on Thursday, the 14th instant, in St. Peter's School-room, Walworth. The Rev. F. F. Statham, President, occupied the chair.

The minutes of the last meeting having been read and confirmed, the secretary, Mr. A. H. Wall, addressed the meeting on the subject of the memorial forwarded to the Royal Commissioners by the South London Photographic Society, and which had been courteously acknowledged by their Secretary, Mr. Sandford.

Mr. Wall said:—I have to inform the members that the memorial addressed by this Society to Her Majesty's Commissioners for the Great International Exhibition was duly forwarded, and its receipt politely acknowledged. But although a circular has been addressed by the Commissioners to the Secretaries of the Sub-committees detailing the various applications for space, and urging such investigations as may tend "to do credit to the present state of national and local industry," photography is as yet unrepresented. It is true that the Commissioners have promised, since the receipt of this Society's memorial, that such a committee should be appointed; but this promise is not yet fulfilled, and precious time is, consequently, being lost. Of all classes of exhibitors few need more time for the preparation of their various works than photographers, especially when such preparations must be made at the worst possible time of the year. It is, therefore, important, both to the interests of the art and the interest of its professors, that any investigations which may be necessary should be promptly made, and such decisions as may be arrived at quickly published, in order that British photography may do honour to the national character. By way of hint to such of our professional photographers as may have greater respect for individual profit as opposed, in their thinking, to national gain, I may, perhaps, venture to point out to them that, so surely as the prejudice against English as opposed to foreign photography (which already shows signs of existence) is proved by next year's great show to be but too well founded, so surely will the encouragement and patronage which photography has met with in this country be, to a very serious and damaging extent, taken from them and bestowed upon their continental brethren; while, on the other hand, if this country carry off the palm for photographic excellence, *we* shall gain crowds of patrons from other lands, and our art thus encouraged must necessarily march more rapidly upwards and onwards to perfection. We cannot, I think, whether as a Society or as mere individual lovers of our art, too frequently urge upon the photographic world the vital consequence of preparing *earnestly* and *thoroughly* for that glorious contest of nations of which this country will next year be the theatre. Holding such opinions as I have ventured to refer to, then, your Committee, at our last meeting, laid before you *the memorial you so unanimously adopted*, fondly hoping that their active energy and promptitude would find the most hearty welcome and appreciation in every section of what the *Daily Telegraph*, in respectfully naming this Society, calls "the great modern guild." I have no reason to believe this is not the case; but the editor of our late organ, The British Journal of Photography, strangely misconceiving the spirit and purpose of our memorial, has not only protested against it as an individual member of this Society, but has denounced it as illegal, and satirised it to the best of his ability in the leaded type of a leading article. Mr. Shadbolt holds that "such a document could not be adopted as that of this Society without previous notice of so important a measure being contemplated." Now, whether judged by our own laws or by precedent and custom, I hold that the course we adopted cannot be questioned. If Mr. Shadbolt think otherwise it is very easy to show cause for such a belief, until which is done little or nothing can be said in reply to this accusation. With reference to the article in that gentleman's journal, it indicates chiefly that Mr. Shadbolt must have a very fertile imagination. Our memorial points out that a Committee for the management of the photographic department is of vital consequence, and urges that such a Committee be promptly organised. Surely no one will deny either the necessity for, or the non-existence of, such a Committee. But our imaginative friend, the Editor, trembling with fear lest what he calls "a small (not to say a very small) suburban society" should prove a second Curtius, and leap into "the yawning gulf *supposed* to exist in the form of a vacant space where a Committee for managing photographic affairs ought to be found," quite overlooked the fact that this Society, in its memorial to Her Majesty's Commissioners, never implied or intended that it should "sacrifice itself by leaping *bodily* into the void space." I trust, therefore, that this assertion will calm down the eager fears of our too susceptible censor, and convince him that there is no fear of this Society taking undue precedence of its elders, *unless they choose, by retreating, to leave their southern relative foremost in the van.* I trust that, as a Society "established for the advancement of photographic art and science," we shall never be deterred by the fear of misrepresentation from taking any steps clearly and closely united with the duties we have voluntarily sought and generously undertaken.

The President, in making a few introductory remarks, desired to apologise for his absence on the occasion of the first meeting of the Society for the session 1861-2. It was not necessary for him to say more than that family matters of pressing importance demanded his attention, which he regretted the more, as he had since been informed that the unfavourable state of the weather *on that occasion had caused a very limited attendance of members.* In reference to the remarks which Mr.

Wall had just read to the meeting, he (the President) might say that the feeling which was uppermost in his mind was one of regret at the evidence of ill-feeling displayed by the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY towards the framers of the memorial alluded to in a leading article of that Journal, which article had called forth Mr. Wall's remarks. He (the President) could not but think that the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY was making charges without due consideration, since he (the President) had always understood that a similar course of action had been proposed for each and all of the Photographic Societies; and had this intention been carried out, greater weight would have attached to the combined representations of a number of Societies, and more solid advantages would doubtless have been secured in the interest of photography. He (the President) could not but be sorry that a subject which should have proved a source of harmonious action among photographers, especially those of the metropolis, should have acted rather as the "apple of discord," and caused disunion among those who should have been united. In justice, or rather charity to the gentleman who had made himself so *unpleasantly prominent* in the matter, it must be assumed that he adopted his course of action from a sense of duty, however much we might conceive him to be mistaken therein.

The CHAIRMAN then announced that Mr. G. Wharton Simpson had kindly prepared a short paper, which he would now read to the meeting, *On Mounting Photographs.* [See page 420.]

[In illustration of the paper, the author exhibited a considerable collection of fine photographs by Rejlander, Robinson, Heath, Thompson, Mudd, &c., which were much admired, eliciting the especial commendation of the President.]

Among so many rare gems it would be difficult to select any one for especial notice: there were, however, some two or three which attracted the attention of the meeting, as very apt illustrations of the advantage of judicious mounting. The actual photographs, in the instances alluded to, were cut into ovals of the size which would be yielded by the ordinary ninth and sixth size gilt mats; but, being mounted as they were, on a thin board with a lithographic tint, of about the outside dimensions of a whole plate, they were set off in a remarkable manner, and seemed to acquire additional importance and have their beauty greatly enhanced.

Mr. SEBASTIAN DAVIS asked if the *carte de visite* pictures, now so deservedly popular, had been mounted on tinted mounts.

Mr. HUGHES replied that the pictures alluded to by Mr. Davis had been mounted in that way, but without any obvious improvement in their appearance—the method being, in his opinion, unsuitable where so little margin was displayed as in a *carte de visite* portrait.

The PRESIDENT felt that he was only giving expression to the feelings of every one present when he acknowledged how much the meeting was indebted to Mr. Simpson for the interest which he had thrown around a subject which, at the first glance, would seem to have been so barren, and for the very efficient method he had chosen for illustrating his paper, by the exhibition of so valuable a collection of photographs. In view of the general scope of Mr. Simpson's paper, the truth of the adage, "beauty unadorned is adorned the most," became somewhat questionable; for, as in society, a tastefully chosen dress, and the exercise of a refined judgment in the selection of ornaments, were found to add grace to and increase the attractions of even the best-looking either among men or women, so he conceived that in art, and especially in photographic art, a carefully chosen and appropriate style of mounting not only displayed a good photograph to the best advantage, but, in many instances, successfully concealed defects in inferior photographs, which would otherwise have become unpleasantly conspicuous. He desired to corroborate in every point, and bear testimony to the importance of Mr. Simpson's remarks on the shape which should be given to the photograph before placing it on the mounting board; and, in reference to the securing of greater accuracy in cutting ovals, he was of opinion that there was room for the introduction of an ingenious and not too expensive machine for shaping elliptical photographs with a nearer approach to mathematical accuracy. Glasses had been recommended as guides in cutting photographs, but as some difficulty, and consequent expense, was involved in first shaping the glass, it occurred to him (the President) that a good substitute for the purpose might be found in a peculiar preparation, something like horn, which was procurable at the artists' colour shops. He (the President) regarded that portion of Mr. Simpson's paper which referred to the adhesive materials employed in mounting photographs as of great importance; for he had observed that, when paste or starch was made too thin, there was a great tendency to the growth of fungi, and that when isinglass or glue was made too thick, there was a tendency to peel off. It occurred to him that it might probably be an advantage in the preparation of starch paste to triturate it in a mortar, with the object of removing grittiness and any insoluble particles.

Mr. SIMPSON remarked that many amateur and professional photographers had experienced difficulty in separating a photograph from the board upon which it was mounted when an occasion arose requiring it to be done: he would, therefore, mention that he had always been successful in his trials in that direction when he had adopted the plan of laying upon the photograph a piece of clean white blotting paper, dripping wet, which supplied just sufficient moisture to penetrate the picture and admit of its complete separation from the cardboard. He was of opinion that the horn-like paper shapes, suggested by the President, would be found too thin for the purpose, glass having the advantage of perfect transparency, and a sufficient thickness to act as a guide to the knife. It was usual, also, before cutting, to use various sizes and shapes of openings, cut out in cardboard, by placing them temporarily on the picture, to see which suited the subject best.

Mr. MARTIN, in reply to the suggestion of the President relative to trituration in a mortar in the preparation of starch paste, remarked, that as starch generally occurred in commerce in a tolerable state of purity from inorganic or siliceous grit, there would be no necessity to triturate on that account; and if the object in view was the mere mechanical contusion of the starch granules themselves, it was equally unnecessary, as the effect of the boiling water used would be to cause the entire disruption of these granules, resulting in the production of a paste possessing complete homogeneousness throughout its entire mass.

Mr. SIMPSON corroborated the remarks made by Mr. Martin.

Mr. HOWARD said that his experience led him to give the preference to dextrine as a material for mounting. In mounting small pictures he had found it advantageous to correct the cockling, and, at the same time, to impart an additional gloss to the surface, by turning the picture face downwards on a piece of thick plate glass, and rubbing on the back with a key.

Mr. WALL remarked that a glass bottle had been recommended for the same purpose, but a still more appropriate instrument was an agate burnisher.

Mr. SIMPSON expressed a hope that Mr. Blanchard would favour the meeting with some remarks on the analogy assumed to exist between the rules applicable to the mounting of photographs and some of the laws of music.

Mr. BLANCHARD did not think that the matter alluded to by Mr. Simpson admitted of any very elaborate statement; briefly, it stood thus:—A succession of straight lines in a photograph and its mounting was apt to become as wearisome to the eye as a succession of thirds and fifths to the ear in music; the object, therefore, to be aimed at was, by the adoption of a tasteful and judicious style of mounting, to produce a harmonious variety which should be pleasing to the eye. There was one subject which had not been mentioned by any gentleman present upon which he should be glad to receive some information: he alluded to the *difficulty* of separating a photograph from the cardboard upon which it had been mounted when the mounting had been effected by means of starch, he having had to soak the print as long as twelve hours in water. He would mention also that he had found it convenient to cut out his photographs with a very sharp *knife* upon plate glass; and in mounting *carte de visite* portraits he found it best to moisten the cards first.

Mr. WALL had experienced the same difficulty in removing starch-mounted photographs, and would be equally glad to receive a suggestion on the subject from any gentleman present.

Mr. SEBASTIAN DAVIS regarded gelatine as the best material for mounting. He prepared his solution by soaking the gelatine first in cold water until it had swollen considerably, and then adding the hot water, when it would be found to dissolve very freely. It should be applied to the paper hot, and be brought into contact with the mounting board just at the moment of setting. It offered the advantage of allowing great facility of *un*mounting, as it was only necessary to hold the photograph over the steam of boiling water for a short time, and the gelatine became at once soft enough to admit of the complete separation of the picture from the board.

Mr. SIMPSON remarked that there was a considerable analogy between Mr. Davis's method and the plan followed when Scotch or Russian glue was used as the mounting material. Some persons had recommended metagelatine as a suitable substance for mounting: it was, however, by no means in general use.

The PRESIDENT suggested, in reply to Mr. Wall's remarks, that as it was so difficult to remove the photograph from the card, it might perhaps be easier to separate the card from the photograph.

Mr. SIMPSON said he had resorted to that plan with advantage: he had soaked the card by floating it on water, and when saturated with moisture, turned the picture face downwards, and *rubbed off* the card with his fingers.

The PRESIDENT thought it possible that starch-mounted photographs might sometimes, near the sea, become stained blue from the action of iodine.

Mr. MARTIN begged to remind the President that one of the essential conditions necessary to the reaction to which he had alluded was, that the iodine should be in the free state. Now it was fair to assume that any minute traces of iodine contained in a state of diffusion through the atmosphere in the neighbourhood of the sea would exist as iodide of sodium, in which case the blue colour would not be produced. In reference to the remarks of Mr. Blanchard and Mr. Wall, on the difficulty of unmounting starch-mounted photographs, it had occurred to him (Mr. Martin), during the discussion, that it would perhaps be possible to effect a separation more readily by floating the card on a solution of some weak vegetable acid, as for instance oxalic or tartaric acid, which would have the effect, especially if the solution were warm, of converting the starch into dextrine, and this latter substance would then become readily soluble in the water. He merely offered this as a suggestion, sensible of course that its value would have to be tested by experiment.

Mr. Howard thought the acids suggested by Mr. Martin would exercise a deleterious action on the photograph.

Mr. C. Jabez Hughes directed attention to the advantage which a large margin was to small pictures in some instances, though, of course, the same proportion could not be extended to the larger sizes. Some persons objected to moistening mounting boards on account of the destruction of the glass. He (Mr. Hughes) had found india-rubber solution sparingly applied to the corners of a photograph very convenient for mounting: the pictures so mounted were also easily removable, by means of a paper-knife, and the book or board was unsoiled by the solution.

The President, in conclusion, remarked that the subject introduced by Mr. Simpson had assumed such unexpected importance in the discussion, that it was not altogether improbable there might, one day, be consulting photographers, to indicate merely the best style of mounting, just as he had been told there were in Paris consulting barbers, who merely gave instructions to the really working barber as to what style of hair-cutting was most appropriate to a particular style of countenance.

The Secretary announced that, through the kindness of Mr. Hughes, the Experimental Committee would meet at his house, as being a more central point of rendezvous.

It was proposed by Mr. Wall, and seconded by Mr. Hughes, that Mr. Wormald be elected a member of the Society. The proposition was carried unanimously.

The Secretary announced that, in accordance with Rule II., the next meeting of the Society would be special. One of the subjects for consideration would be the appointment of a place of meeting in a situation more convenient for the members of the Society generally.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary monthly meeting of this Society was held on Wednesday, the 6th ult.,—J. Sidebotham, Vice-President, in the chair.

The Chairman said that it had been their custom, and he thought it was a very wise one, to call attention to old matters which were published as novelties. At the last meeting he had pointed out an instance of this kind in reference to a camera described in The British Journal of Photography by Mr. Cramb. That gentleman had treated his observations as a personal attack. He (the Chairman) should be sorry for such an impression to exist; but when an invention which had been before the public for years was published as something original he thought it his duty to correct it. Mr. Cramb might not have seen Mr. Dancer's camera; but if he doubted the correctness of his remarks an instrument should be forwarded for his examination. The Chairman also said that, since the last meeting, he had made some experiments on the use of coloured glasses for dark rooms, and had found that the green spoken of by Mr. Petschler would not answer the purpose. He exhibited a sheet of paper which, when sensitive, had been exposed under glasses of different colours: the portion covered by green was considerably darkened. Where the light had to traverse a yellow medium, its action was also observable, and those two pieces of glass combined were insufficient. Ruby and orange tints preserved the paper entirely; and it therefore appeared that some tinge of red must be present to prevent the passage of the chemical rays.

Mr. Petschler said that in recommending the green glass he did not intend it to be used alone. He assumed that there was in the first instance a screen, which would of itself be sufficient, and that the green should merely be used to modify the tint of light and render it more pleasant to the eye.

In reply to an inquiry, the Chairman stated that he had found the same results in transmitting light through the coloured glasses to sensitive collodion.

Mr. Nevill suggested that, if a modified tint of light for the eyes only were required, spectacles of green glass would be a ready method of obtaining it.

Mr. Noton then illustrated the preparation of plates upon his "compound albumen" method. [See page 404.] The excellence of the plan adopted for coating the plate was strikingly evident; and it was admitted generally that one great difficulty in the use of albumen was removed. In reply to inquiries, Mr. Noton stated that he used six grains of iodide of ammonium and one and a-half of bromide of potassium in the albumen. He had tried ten grains, but with inferior results. Generally he found that a drachm of water was sufficient for the white of one egg; but no positive rule could be relied upon, as albumen varied considerably in quality.—Mr. Noton also developed a picture during the meeting, and the result was perfectly satisfactory. Several negatives which had been taken since the previous meeting were handed round, and a general desire was expressed that the process should be thoroughly tried.

Mr. Töbler exhibited a blow-pipe he had received from Germany. The blast was effected by squeezing an India-rubber bag, from which the air was thus propelled into a second India-rubber bag, furnished with a tube for directing the current to the flame. The second bag contracted by its elasticity when the first was released from pressure, and thus a continuous blast was kept up. Mr. Töbler fused some chloride of silver upon a lump of charcoal with this blow-pipe and an ordinary gas-jet.

Votes of thanks to Mr. Sidebotham for his experiments with the coloured glasses, to Mr. Noton for his illustrated paper, to Mr. Töbler, and to the Chairman, closed the proceedings.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The opening meeting of this Society for the session was held in George Street Hall, on the 12th ult., the chair being occupied by W. Scott Elliot, Esq., There was an average attendance, the meeting being graced by the presence of a few ladies.

The following gentlemen were admitted as members:—Mr. A. B. Fleming, Mr. John Scarth, and the Rev. D. T. K. Drummond.

A paper was read by Mr. T. B. Johnstone, giving an account of a new difficulty in photography.

Although we trust that this "difficulty" has merely a local application, it may be interesting to our readers to know what it was, and accordingly we insert a digest of it.

Mr. Johnstone, who is well known in artistic and commercial circles in Edinburgh, and who is an amateur photographer of some standing, had occasion, during a temporary summer residence at the Bridge of Allan, to set out with his camera to take a view of the Ochil Hills. He had planted his camera at the side of the public road which leads to Blairlogie. While his picture was being impressed, he was accosted by Lord Abercromby (who was described as a fair-haired young man, who wore his hat on the back of his head), along with two attendants, and in a bullying tone was told by his lordship that he had no right to be there with a camera. The reason his lordship assigned was, that his pony might perhaps shy at seeing the camera. Mr. Johnstone answered his lordship respectfully, but declined moving, on which the aggressors rode away. His lordship next sent three men, one of them a county policeman, to order him away. Mr. Johnstone handed them his card, and desired them to inform Lord Abercromby that he refused to do so. Artists, Mr. Johnstone argues, may be excluded from private property; but if, according to Lord Abercromby, they have "no right" to study art on the high road, where, he asks, in the name of wonder, is art or nature to be copied or studied?

The sentiments of those at the meeting were decidedly adverse to Lord Abercomby's interference; and Mr. Harvey, R.S.A., said they were all much indebted to Mr. Johnstone for his spirited resistance.

Mr. Walker briefly described the method of operating with the panoramic camera, which he stated Mr. Ross had kindly sent down for the Society's inspection. There were no specimens of its performance accompanying it.

There being no other business the meeting separated.

CHORLTON PHOTOGRAPHIC SOCIETY.

The members of this Society met on the 14th ult.,—Mr. Wm. Griffiths, Vice-President, in the chair.

There being no paper before the meeting, the Chairman proposed that the evening should be devoted to a discussion of the wet and dry processes; and, judging from the energy with which the subject was taken up, the suggestion seemed to be well-timed and agreeable.

The discussion was quite of a conversational character, and opened, of course, with the consideration of glass, the prevailing opinion being that good flatted crown is generally to be preferred for ordinary work, but that thin plate should always be employed for choice subjects, or for negatives that are likely to be subjected to much work in the printing-frame.

A Member said it might, perhaps, be better to always use thin plate, as in that case photographers were probably less inclined to sacrifice a plate to an inferior subject.

Next came the operation of cleaning. Here tripoli and all dusty agents were unnoticed, except to condemn them as being a fertile source of spots. The majority of the speakers were in favour of dilute nitric acid for new glass; and many also advocated it for glass that had been used.

Mr. Wardley thought it the simplest and safest article that could be applied for the purpose of cleaning glass: stains and impressions of former pictures were not known to manifest themselves after its employment.

Mr. Fawcett said he always used equal quantities of water and commercial nitric acid for any kind of glass, new or old. His practice was to rub it well over the plate with a tuft of cotton, rinse, and dry, and afterwards polish with a bit of clean wash-leather. He said all glass should be cleaned immediately before using it.

Mr. Wardley recommended those members who did not clean their plates just before using them to store them away with their faces in contact, so as to prevent access of dust, &c.

In allusion to varnished plates,

Mr. Knott informed the members, that plunging them into boiling water would quickly remove any varnish. A very adhesive film of collodion only would almost instantly yield to an application of wood naptha.

A Member asked if it were really essential to saturate the silver bath with iodide of silver?

In reply, several members said they usually dispensed with that precaution, and had so far met with no evil result to induce its adoption.

Mr. Knott said the presence of iodide of silver in excess had given him pictures full of small transparent spots, or pin-holes, these spots ceased to annoy him after he had removed the excess of iodide from the bath. He found that iodide of silver was less soluble in a hot than in a cold solution of nitrate of silver. He first suspected this from the fact of being able to obtain clear pictures in winter while he was frequently

annoyed with spots during the short months of summer. To test this he warmed his bath, and found it became milky-looking: he then cooled it, and the original appearance was restored—consequently when he had reason to suppose there was too much iodide of silver in his bath, he made it hot, and passed it through a filter while in that condition, By this simple operation the insoluble excess was of course removed. He should be glad if any gentleman present could explain to him why certain comet-like marks, which sometimes found their way into collodion films, should, when developed with salt of iron, be opaque in the head or nucleus and transparent in the tail, and the reverse when developed with pyrogallic acid. The marks to which he alluded were apparently caused by a bit of undissolved cotton or set collodion from the neck of the bottle.

Mr. Rogerson, replying to a member, said the presence of nitric acid in the silver bath would cause streaks in the film.

The further discussion of the subject was adjourned to next meeting. A vote of thanks was passed to the Chairman, and the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

A meeting of this Society was held on the 6th ult.,—G. H. Slight, Esq., Vice-President, in the chair.

Mr. Neilson was admitted a member.

Mr. Bow, C.E., read a paper *On Photographic Distortion* [see page 417], illustrated by some large and beautifully-executed diagrams, which were suspended on the wall.

After some remarks on the subject by several members, the Secretary intimated that the meeting that day fortnight would be of a popular character, to which the members might introduce their friends by means of tickets, which he would duly forward to each member; and that through the courtesy of Mr. Moule, of London, the patent photogen would on that occasion be exhibited in operation.

After the thanks of the Society had been awarded to Mr. Bow, the meeting separated.

A popular meeting of this Society was held on the 20th ult., in Messrs. Dowells and Lyon's large saloon, George Street. The hall was quite filled with the members and their friends, a great number of ladies being present.

The chair was occupied by J. D. Marwick, Esq., President of the Society, who, in a few remarks, called attention to the remarkable degree of success which had attended this Society since its formation in April last, the number of members on the roll being above 70. Without anticipating the report of the Council, which would be read at their annual meeting that day fortnight, he might say that they anticipated having classes for their more inexperienced members, in order that they might be brought as far as possible to the level of the rest.

Mr. John Lennie then exhibited a number of dissolving views, embracing several views of Paris, statuary, &c., which were frequently applauded.

Mr. Moule's patent photogen was next exhibited. Mr. Nicol briefly explained the nature of this invention, showing that a small quantity of a peculiar powder was ignited in the lantern-looking apparatus in a receptacle for the purpose, and the light generated was of such a nature as to admit of a photograph being taken with an ordinary camera in little more than a dozen of seconds.

Some gentlemen selected from the audience then sat for their portraits, and the results were such as to show that good portraits may be taken altogether independent of *daylight*, and at a very cheap rate, without, of course, the hitherto necessary and, to amateurs, disadvantageous glass house.

A cordial vote of thanks was awarded to Mr. Moule for his kindness in giving the use of the photogen; to Mr. Lennie, for his exhibition of dissolving views; and to Mr. Horsburgh, by whom the greater number of the pictures had been taken.

Foreign Correspondence.

Paris, November 28th, 1861.

The French Photographic Society's first meeting of the season was principally taken up by a report of the results of the late Exhibition—which were very satisfactory from a pecuniary point of view—and also by a discussion, of which I will say a few words presently.

Numerous pictures were presented to the Society at this meeting. M. Jeanrenaud exhibited some new and very remarkable landscapes which he had obtained with the Taupenôt process. M. A. Thouret, who had tried Major Russell's tannin process, showed a series of pictures, constituting in themselves the highest eulogium on that method, which at last is beginning to receive the attention it deserves.

MM. Bisson presented some specimens of the new collection of views which one of them had brought back from his journey to Mont Blanc and Mont Rosa. They are splendid panoramas, delightful pictures of the sites most sought after by tourists, and are distinguished by the skill which marks all the works of those laborious artists. Lastly, M. Migurski passed round a large number of portraits, groups, types, and views, all relating to his own country (Russia). M. Migurski has experimented on most of the processes which are known, and has turned them to good account in the execution of his very diversified collection.

Some new carbon pictures were presented by M. Charavet, the proprietor of M. Fargier's patent. They are inferior to those by M. Fargier, although M. Chavaret has announced, as an improvement, a modification by himself of the process which he has acquired. To use his own terms, he employs the salt of uranium and sal ammoniac. We think he meant to say the azotate of uranium and the bichromate of ammonia, which cannot advantageously be substituted for the bichromate of potash indicated by M. Poitevin, as is proved by numerous experiments.

The long discussion referred to above need not be given here. It arose from a laudatory account by one of the members of a visit he had paid to the *atelier* of M. Dagron, the maker of the microscopic jewels. Two points alone appear to me sufficiently interesting to be reported. The first is that the development of this application of photography to rings, pins, watch-keys, and other small objects, is so great that M. Dagron employs 150 workmen. The second important point is that, according to M. Dagron's formal declaration, publicly made the other evening, that gentlemen by no means asserts that he is the inventor of microscopic photography, nor of the rectangular prismatic microscope, known under the name of Stanhope's. M. Dagron only claims as his own the idea of fixing the photographic picture to the microscope, and the application of this kind of photography to jewellery. As M. Dagron possesses patents in France and in other countries, and as there is a lawsuit pending before the French courts, this declaration is of importance.

M. Wothly sent to the Society several pictures obtained with his salt of silver printing process. From what M. Wothly gives us to understand, and from the analysis which has been made of them, they must be executed with the help of the gallates of copper and of iron. It is well to add, while on this subject, that M. Poitevin published, some years ago, a formula, by which he produced pictures with gallate of iron. The paper—one side only—was placed upon a solution of 10 grammes of perchloride of iron in 100 grammes of water. Thus prepared, and then dried, it was put under a *direct positive* on glass, and exposed to the light. The paper, at first yellow, became white in all the parts corresponding to the lights of the positive *cliché*, so that there was a yellow design upon a white ground. To change the yellow into black, the sheet was plunged at first into distilled water, and then into a solution of gallic acid; or else, according to the tone desired, into an infusion of nutgall, or into a mixture of gallic acid and pyrogallic acid.

It is, doubtless, by an analagous process that M. Wothly prints his pictures, which are, it must be added, very fine.

An amateur, the Abbé Guiraut, sends me the following observation:—

"If, for the space of five minutes, I place a sheet of albumenised paper upon distilled water, it loses its albumen and its brilliancy. If I place it for the same interval upon a 15 or 20 per cent. silver bath, it preserves its qualites and its appearance. Profiting by this fact, I have convinced myself that the poorer a bath is in crystals the more it detaches the albumen. I have found also that nitrate of silver, especially dissolved, coagulates the albumen. Starting from this principle I break my crystals as small as peas, and, after ascertaining with the *pèse-sels* the quantity of silver that the bath has lost, I introduce therein these crystals. I stir the bath well, then filter it, and, to my great satisfaction, it is purified, without the addition of any foreign substance such as kaolin, aluminium, earth, &c., and without the loss of a centigramme of silver. Afterwards, I have only to add distilled water, so as to keep the per-centage at from 15 to 20."

For correcting the reddish tones that are often seen in pictures on albuminised paper the Abbé Guiraut dissolves in alcohol as much iodine as it can contain. He also prepares a two per cent. solution of cyanide, a small quantity of which he preserves in a phial. He pours the first solution into the second, till the latter assumes a violet hue; then he adds, drop by drop, the solution which he has kept apart, till the colour disappears. With five or six grammes of this liquid per litre of water a bath is formed. The picture is plunged herein till its lights and shades have taken a good tinge, after which it is well washed.

I have before me a statutette, which has just been executed by M. Willème by means of his process for photo-sculpture. It is the result of twenty-four images, which represent twenty-four different

profiles, and from which the pantograph has fashioned the head, according to the system described in one of my previous letters. The hand of the artist has had but to complete the work of the instrument, just as that of the *retoucheur* stops up the holes and removes the blemishes of ordinary photographic images. It is said that this ingenious invention is shortly to be worked on a large scale for reproductions, the manufacture of bronzes, and also for portraits. I have no doubt that it will obtain the favour of the public. Perhaps, before long, every one will be wanting his photo-sculptured bust, in addition to the visiting-card of the present day.

ERNEST LACAN.

New York, October 29th, 1861.

I HAVE called upon some of our prominent photographers for precise information as to their present methods of working. I have no difficulty in procuring the information desired, but I am somewhat restricted in the communication of it to the public.—1st. I am desired to omit any mention of names. Our photographers, like artisans generally, desire their neighbours and rivals to believe that there are profound mysteries: very few are willing to confess that they are no better off than others. Every ignorant man has his tremendous secret: it is only the most intelligent who have any modesty and feel that there is a narrow limit to their knowledge. I know no animal more piggishly obstinate and self-contented than your "artist" who threw away his lapstone only last week to become a photographer.

The omission of our photographers' names, inasmuch as they are seldom heard among the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, I trust will not detract from the interest of, or faith in, the account I shall give of practical photography here.

A large majority of our photographers manufacture their own collodion. The reason probably is in the fact that the ingredients of collodion are everywhere cheap and accessible. Alcohol, suitable for collodion of 95 per cent., is sold for fifty cents to one dollar per gallon, and ether for twenty-five to fifty cents per pound. The most ordinary proportions for ether and alcohol for collodion is equal parts. There are those who prefer an excess of one over the other, but the old dictum of "five to three" is wholly abandoned. Every one here uses a bromide in the collodion. In the early days of photography bromide of potassium was universally employed; now no one thinks of it, and only for the reason that it requires too much water to be introduced into the collodion in order to dissolve it. For a few years iodide and bromide of magnesium were great favourites, chiefly on account of their recommendation by one of our then high authorities, Mr. Moulton.

For developer, the sulphate of iron is in universal use. Pyrogallic acid was laid on the shelf six years ago.

The independent gold toning is adopted by all those who use albumenised paper.

I present the following formulæ as the most relied upon:—

COLLODION.

Ether	5 ounces.
Alcohol	5 „
Gun cotton	50 to 80 grains.
Iodide of ammonium	50 „
Bromide of do.	20 „

Or with the above plain collodion—

Iodide of potassium	2½ „
Do. of cadmium	4 „
Bromide of do.	2 „

OR,

Iodide of potassium	5 „
Bromide of cadmium	2 „

The silver bath—40 to 50 grains of nitrate of silver to the ounce of water.

DEVELOPER.

Water	20 ounces.
Sulphate of iron	2 „
Acetic acid	3 „
Alcohol	2 „

In the remainder of the process there is nothing worth mentioning, unless that the impression seems to be extending that it is unnecessary in printing to use over fifty grains of nitrate of silver to the ounce of water, for albumenised paper.

As a strengthener for negatives sulphide of potassium may be found in every gallery.

CHARLES A. SEELY.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

IRON DEVELOPING, &c.

To the EDITOR.

SIR,—Will you kindly allow me, through your Journal, to correct what I am afraid is a wrong impression conveyed by Mr. Hughes's reply to Mr. How's remarks on iron developed negatives, at the meeting of the North London Photographic Association, held on the evening of the 23rd Oct., a report of which appeared in your Journal of Nov. 1st. Mr. How did not claim for my collodion the mere property of giving dense negatives when developed by iron, because (as Mr. Hughes justly remarked) that was common to most good preparations of collodion; but what he *did* claim was what we must all consider the *desideratum* of collodion, *density without losing half-tone, or sensitiveness without subsequent intensification.* With your permission I will give your readers my formula for development.

BATH.—Pure nitrate of silver thirty-five grains, distilled water one ounce. Having made sufficient bath for use—say fifteen ounces—shake up with it half-an-ounce of collodion (iodised in the proportion given on the bottle) and five drops of glacial acetic acid; let it stand for an hour or two, occasionally shaking it; after filtration it will be found fit for use.

DEVELOPING SOLUTION.—Protosulphate of iron ten grains, glacial acetic acid thirty drops, water one ounce, dissolve thoroughly, then add one drop of strongest liquor ammonia. Intensity in the negative may be carried to any extent, after well washing, by re-developing the impression with a solution of pyrogallic acid two grains and acetic acid one drop to the ounce of water, mixed with a few drops of old nitrate of silver bath. A better method is to add to the silver bath (to be repeated when necessary) a drachm or so of a solution containing two grains of fused caustic potash to an ounce of distilled water: in this case re-developing is generally unnecessary.

FIXING SOLUTION.—Cyanide of potassium or hyposulphite of soda.

The reasons why I was induced to prepare this peculiar collodion were these:—

Some three years since I was operating in India, and was annoyed at the density, hardness, and length of exposure of the negatives I obtained with pyrogallic acid. I lowered the strength of the bath in order to see if I could get better half-tone, but to no purpose. I now tried iron; but here the fault was the other way. I could get no density at all, unless I blackened with pyro.; and then the high-lights still blackened out of all proportion to the half-tone. This I found to be the result with all the samples of collodion I could there obtain, which I attributed at the time, and still do, partly to climate and to the unaccountable partiality which amateurs possess for ridiculously dense negatives. In this fix I was compelled to turn to, with such materials as I could obtain, and make my own collodion to suit the climate, when my difficulties at once vanished, and I adopted the developer and collodion which I have ever since used, with the greatest success, both in India and in England. It is a curious fact that, although the ammonia and acetic acid form acetate of ammonia in this developing solution, yet if acetate of ammonia, soda, or potash be added, the same results are not produced.

Now comes the point where I cannot quite agree with Mr. Hughes. I contend that there is no advantage in developing collodion negatives (although advantageous to paper) with a weak solution of pyrogallic acid or iron if after-intensification be necessary, because its action is quite uncontrollable, seizing on those parts most acted on by light at the expense of half-tone; whereas, by making a normal solution of iron and acetic acid the desired density of a negative may be secured to a mathematical nicety beforehand, at one development, by simply adding a proportional quantity of liquid ammonia to the iron solution, thereby avoiding those annoying stains and markings so difficult to avoid in development. In adding the ammonia, I find (supposing the normal solution to give a flat negative) the proper quantity to add is just one drop to the ounce, as more than that gives too much density, and causes it to act in a similar manner to pyrogallic acid, in being uncontrollable in its action on the high lights. I may add that the most of our eminent photographers are taking the same view of iron as a developer. The beautiful views of China, Japan, &c., published by Messrs. Negretti and Zambra, of Hatton Garden (who use my collodion exclusively) are developed by my formula; so are the Art Union views of the Crystal Palace, Sydenham; and also those wonderful and well-known productions by Mr. Frith, of Egypt, Nubia, &c., the quality of which needs no comment.

I trust this explanation will be acceptable to your readers, as they are the results of my many years' experience as a practical operator; and, so far from wishing to take up the valuable space in your journal unprofitably, I can only say it was simply the earnest wish I have to contribute my mite to the general information on our beautiful art which induced me to send the prints and negatives for inspection.

I am, yours, &c., HENRY MATHESON.

PRINT-WASHING.

To the EDITOR.

SIR,—Some two years ago I devised a plan for washing photographic prints, combining the advantage of a roller covered with sponge, washing in hot water, and leaving the proofs all night in running water. Until lately, I flattered myself that my plan was infallible; but alas! I now find that some of my most cherished pictures—which were printed more than a year and a-half ago, and have since been mounted on card-board, and carefully kept in a portfolio in a warm room—are beginning to show unmistakeable *yellow spots*. They are toned with chloride of gold and carbonate of soda, according to the usual formula, and fixed in the usual bath of hyposulphite of soda.

I suppose that most photographers, after fixing their prints and washing them in several changes of water, leave them for the night in water—running water, if available—and probably wash them in the morning in hot water, before drying them.

Now, it is easy enough, if you have command of a tap, to arrange a box, or, better still, an earthenware vessel, so that a small stream may be caused to flow through it in almost any direction: *the difficulty is to prevent the prints from sinking to the bottom, and adhering together*. Can you, or any of your public-spirited correspondents, suggest any mechanical contrivance which will obviate this difficulty.—I am, yours, &c.,

November 21st, 1861. A SUBSCRIBER.

[We are strongly opposed to washing proofs in running water, and, indeed, to *very* prolonged washing at all. The really effective way is to use many changes of water, taking out the prints and hanging them up to drip for a few minutes between each change. It has been asserted that this method is impracticable on a commercial scale: the validity of this assertion, however, we cannot admit. This operation requires no skilled labour, and is therefore not at all costly. When the prints sink in water, it is an indication that the size is removed from the paper; and this is, in our opinion, highly injurious, both to the beauty and stability of the proofs.—ED.]

PHOTOGRAPHIC LOCALITIES.

To the EDITOR.

SIR,—I am much pleased to notice that you are to present your subscribers, at the end of the year, with an Almanac similar to the one we received last Christmas. I am sure it will be good and useful; but I think you will greatly enhance its value if you would add to its usual matter a good list of places, and how to get at them, suitable for obtaining good *views*. A long list could easily be made up and condensed from the various tours described in the Journal during the last three or four years, and, no doubt, from other and original sources. A hint in the next number of the Journal (if you think that necessary and advisable) would, I am sure, bring you "no end of information."

To amateurs, who have often to lose half of their *one precious day* in discovering good sights, this information would be invaluable.

I am, yours, &c., A SUBSCRIBER.

London, 16th November, 1861.

[If our subscribers will favour us with any information on the subject above indicated we shall be happy to "lick it into shape," if possible. At any rate it is not improbable that we may include something of the kind from our own resources, if we do not receive the assistance contemplated. The places named should be referred to the nearest *important* towns, with approximate distance and readiest mode of access therefrom; also hints relative to the class of scenery or subjects to be obtained, *e.g.*—

Seven Oaks, Kent.—Ancient mansion in Knole park—fine groups of trees—rural spots—general undulating landscape, &c. From London 37 miles. Access by Mid-Kent railway to Bromley; thence by omnibus or by South Eastern railway to Tunbridge; thence by omnibus 4 miles.

Chatsworth, Derbyshire.—From Sheffield miles by coach to Bakewell; thence by omnibus 4 miles. From Buxton miles (coaches daily). From Matlock by rail to Rowsley; thence 2 miles. From Manchester miles by coach to Rowsley, &c.—ED.]

ANSWERS TO CORRESPONDENTS.

S. S.—Received with thanks.

AG. NO 5.—Messrs. Johnson and Matthey, Hatton Garden, London.

SARAH RIDLEY.—Should not your name have been Betty Martin? Your tale is o'er wondrous for us.

SWARTBRIDGE.—If you are resident in London you cannot do better than take lessons at King's College.

A.—If you will refer to our paper recently read at the Bradford Society (see page 357,) you will learn our opinion upon the point.

VIATOR.—We have never noticed the kind of annoyance mentioned by your friend in carrying plates in the manner described.

THOS. L. F. AND SAMMY.—We cannot direct you to any particular house: all three you name are highly respectable dealers.

WOULD-BE EXHIBITOR.—We do not think you have much chance: the 30th September was the last day for receiving applications for space.

R SMELLIE.—See Volume II, new series, page 250, October the 15th, 1858, in reply to your first query; and *ibid*, page 269, 1st of November, 1858, for the second.

BLACK TIPS.—We do not approve of the use of kaolin for the purpose: it is wasteful and tedious. Adopt Mr. Barber's plan, and simple decantation will suffice, instead of filtration.

J. M.—We fear, from what fell from Mr. Ross the other night, that it is too brittle a substance to fit it for lens-mounting. See report of the North London Photographic Association.

SANITARY JAMES.—Ventilation of the dark room we think so obvious a *desideratum* that it needs no recommendation from us to ensure its adoption. Any simple plan is sure to meet with success.

J. O. T.—It is advisable, as a rule, to develop as soon as you conveniently can after exposure; but with some processes this operation may be delayed longer without detriment than with others.

ROBT. QUEENSLY.—Any of the *dry* processes will answer for producing transparencies by contact printing: perhaps the simple plan mentioned by Mr. Noton in our last number will answer your purpose best.

V. H.—G. D.—R. M.—JAS. STONE.—PHOTO.—We are obliged for your approval of the article to which you allude. We have received, orally, many similar expressions of opinion from those with whom we have come in personal contact.

QUAKER.—An obvious misnomer. It is clear you do *not* quake about the matter, or you would not take it so coolly. No direct information has yet been issued on the subject. You are not the only one by many who have, in no measured terms, condemned the proceeding.

C. LARPEY.—We do not see the use of a "swinging back" to your camera, if you use a "panoramic" lens. If you have a sliding front so as to enable you to raise the lens you can tilt the camera when requisite, and it will amount to the same thing as a "swinging" back, as there are no oblique pencils with such a lens. For price, &c., we must refer you to Mr. Thomas Ross.

J. B.—If you require *true* stereoscopic effect—that is, the actual effect to an observer of the scene viewed from the spot where you plant your camera—sliding the lens in front will produce it accurately; but, if you require an *exaggerated* appearance of distance between the distant and nearer objects, you must move the camera also. The lens indicated is quite adapted for instantaneous pictures with suitable chemicals.

RT. ANDREWS.—See a paper by Mr. Simpson in the present number relative to mounting. With regard to stereographs, we have long advocated the use of black or dark grey mounting-boards, as far preferable to the light colours generally in use at present. They may not look so well out of the stereoscope, but they certainly have a much better effect in it. We have frequently discussed the subject before, and must refer you to back numbers, which will be revealed by the index.

D. S. R.—The various changes have been necessitated in order to keep up with the advance of our art, and to meet the requirements of the time. We have handed your note over to the Publisher, in whose department your suggestions more particularly lie: we may, however, mention that what you designate an impolitic proceeding has not proved so. Your pyrogallic acid cannot be restored to its original colour; but it may very probably not be injured so as to prevent your using it.

UNFAIR USAGE.—We have to remind the Editor of *Humphrey's Journal* that he has again copied, *without acknowledgment*, from our columns an article written exclusively for this Journal by Mr. Wall, and which appears in our American contemporary's issue for 1st November, occupying four and a-half of his pages. Our brother Editor of *The American Journal of Photography* has treated us in a similar manner with respect to an article by Dr. Maddox, occupying three and a-half pages.

H. H. H.—Proofs which have been treated with chloride of sodium, and the toning deferred, are apt to be "flat" in appearance. The affinity between chlorine and silver is so great that, even when the former is in combination, it will act upon the latter if in contact therewith for any length of time: it is therefore not improbable that the reduced silver forming the proof may be to some extent acted upon by the chloride of sodium, and, if so, it may interfere with the deposition of the gold in toning. We do not think the permanency interfered with, but the brilliancy is somewhat impaired. It is not needful to darken chloride of silver by light prior to its reduction by chemical agency.

T. B.—M. Joubert is quite "in working order" with his burnt-in process upon glass, and is ready to undertake any commissions. You had better address to him direct at 36, Porchester Terrace, Bayswater, London, W. He requires a transparent positive upon glass to work upon; but if you have negatives, and do not care to make your positives, he will undertake that part of the operation as well. The subjects suitable would, in a great measure, depend upon the place to be ornamented. In your case—a glass door between a hall and conservatory—we should select a group of fruit and flowers, *à la* Lance, such as were produced by Mr. Fenton, and exhibited at the last Exhibition of the London Photographic Society. We have no doubt also that these would "colour" well.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 156, Vol. VIII.—DECEMBER 16, 1861.

Photography at the International Exhibition.—The Royal Commissioners have appointed a Committee, consisting of the Earl of Caithness, Mr. Kater, and Dr. Diamond, with Mr. P. Le Neve Foster as the official representative, to manage the photographic department at the Great Exhibition. It will be satisfactory to our readers to know that all these gentlemen are practical photographers and art-amateurs of no small repute, and all directly connected with the Photographic Society. We are assured, also, that, as they all regard the classification adopted as a decided mistake, they will exercise such power as they are entrusted with to remove, as far as possible, the offence which photographers have generally felt at the position assigned to their productions. We therefore bespeak for them the cordial co-operation of those who do not regard photography as a mechanical art. It is, in our judgment, a fortunate circumstance that the Committee consists of but few in number, especially when all its members are so thoroughly unexceptionable. We have reason to believe that no specific amount of space will be allotted to any particular exhibitors of *photographs*, but that those who have applied for space will be permitted to send in pictures not exceeding a certain quantity—the Committee retaining the uncontrolled power of selection and rejection, so that nothing unworthy shall find a place on the walls of the Exhibition room. This will not only tend to elevate the quality of the collection, but will be a positive advantage to the best operators. Another "straw" indicating the course of the wind is worth notice. We have learned from a member of the Committee of the Philosophical Instrument Department that applications for space to exhibit cameras, lenses, &c., have been referred to his Committee. This also is satisfactory, as tending to show the intended separation of the tools from the results of their application.

An Abuse of Photography.—It is always with regret that we observe anything having a tendency to draw down contempt upon or to degrade our beautiful art; and, as a rule, we pass over such matters in silence. Some time ago we were sorry to see several foolish productions in the form of likenesses, in which an enormous head was placed upon a diminutive body, both being taken from the same individuals on separate negatives, and subsequently united. As these were identical in treatment with certain lithographic portraits (!) which came to us some years back from across the Channel, we have no doubt that the photographs to which we now allude had their origin in the same locality.

Although we could not admire the taste of those individuals who thus suffered themselves to be held up to public ridicule, of course it was their own affair; and, as we felt convinced that the public in this country had too much refinement to allow of such an application being remunerative as a commercial speculation, we were satisfied that the folly would soon die out of itself. We have, however, within the last few days noticed a still more offensive misuse of photographic skill; and, as we cannot for an instant suppose the person thus insulted to be a consenting party, we at once record our earnest condemnation, feeling assured that it will meet with a response in the sentiments of the majority of our readers. We may premise that we do not at all admire the gentleman who in this instance has been made the subject of ridicule, and therefore our protest is perfectly disinterested. We now proceed to indicate the nature of the abuse under condemnation.

In the shop window of a certain firm in Regent Street, London, is (or was a few days ago) to be seen a sort of tray containing about a dozen or more small photographs, known as *cartes de visite*, all bearing the likeness, so far as the head is concerned, of a certain noted dissenting minister, but having in some instances appended thereto the body of a gorilla, placed in an attitude commonly assumed by members of the Simian tribe; and, as if to add to the scurrility, these were all labelled—"The Rev. C. H. Gorilla." In others of these precious productions the same head is attached to the body of a man bearing placards hanging before and behind—in the manner jocularly described as "a walking sandwich"—and who, with hat in hand, is in a begging attitude. The placards allude to a lecture on the gorilla at a certain Tabernacle, and are, no doubt, some of the very bills used on the occasion of a lecture which was really delivered.

Surely there must be some simple remedy for such gross impertinence. Of course our remarks do not apply to what might have been done by a personal friend of the victim for a little bit of private fun, though even then the practical joke in this instance would not have been of a very refined nature; but it is the publicity given to the matter which makes it so obnoxious. It is far worse than an ordinary caricature, because, in the latter, however skilful the drawing, it is not the *express image of the person* that is delineated, as is the case before us. We have seen a good deal of harmless fun created in a private circle by carefully cutting out the figures of a number of the operator's own personal friends—male and female, adults and children—and then dexterously mismatching the heads and bodies, attaching them neatly to a mounting card; but in that case the whole of the parties were participators in the fun, and willing to lend a head or body, as the case might be, for the occasion. It will, however, be at once admitted that what may be done with consent and in a private circle with propriety may become highly indecorous if done without consent and in order to excite ridicule in public. But the case we have cited is not even so harmless as we have just indicated; for a gentleman would scarcely like to see his head upon a lady's body exhibited to the public gaze, and still less so one who is known as a professed minister of the Gospel, but least of all would he like to see it attached to the body of an ape. Lastly we consider that the insult does not rest alone upon the individual caricatured; but is almost equally offensive to every one who holds him in esteem, as it is also to many others who, like ourselves, regard him with simple indifference.

Amateur Photographic Association.—We have much pleasure in noticing the continued favour with which this Association is regarded—the number of members having now increased to nearly two hundred, including most of the names of highest renown amongst amateurs; and, although but little more than half the members have as yet sent in their negatives, there are about one thousand of the latter already in hand—all good, but the majority are of a high standard of excellence. It is probable that the time for distributing the prints and the prizes will be settled at the next meeting of the Committee; it is therefore desirable that all who contemplate contributing negatives for competition should do so without further delay. It is manifest that with such an immense number of negatives it is quite impossible to get into full working order without some little delay; but as soon as the prizes are chosen the general distribution will commence.

It may not be amiss to remark, also, that members will be enabled to procure copies of any of the prints sent in by their brother members (*in addition* to those selected for their subscription) at a rate of charge for the extra copies that will be highly satisfactory to the recipients; thus a new feature will have been imported into those of the ordinary exchange club.

Epilogue.—The present number (with which we supply title-page and index) closes the current volume. For the past we have much to be thankful, "journalistically" speaking. A glance through the pages of the volume now brought to a close reveals the fact that the subjects on which we have dilated are numerous and varied; while amongst the names of authors of many valuable papers we find some of the highest repute. Our position is therefore good, and still continues to be progressive both as regards circulation and contributions to our pages. Judging from the many flattering remarks which we are constantly finding in the letters of our correspondents we have reason to conclude that we have been "useful in our generation," and, from the numerous expressions of good-will, that kindly feelings attend our appearance. For the future we are full of hope. Those interested in our art increase and multiply exceedingly in number; and, though we have several competitors in the field of photographic literature, there is ample room for us all. Each one of us may find something special for our hands to do in elevating, refining, and improving. Many of the followers of our art are also cultivators of microscopical science amongst the latter, also, a strong feeling is setting in favourable to the more extended application of photography as a means of delineating microscopic structure. We have, therefore, thought it advisable to endeavour to draw still more closely the bond of union between them; and to that end have arranged, as one of the new features of the volume of 1862, to give reports of the meeting of the Microscopical Society of London. We believe that this arrangement will be acceptable to a great number of our subscribers. Let our motto be—Forward! We shall not be found lagging behind; and where we are assured that there is good to be done, we shall struggle for a place in the front rank of the battle. The last word is an ominous one; for, though written in a spiritual and not in a literal sense, the dark shadow of war hangs over us. We trust, however, that as the New Year dawns brighter hours may be in store, both figuratively and literally; and, with the kindly wishes of the present time-honoured festive season, we bid our readers—"A Happy Christmas."

COLLODION SUBSTRATA.

By John Glover.

In the present state of dry-plate photography a few hints may not be out of place in connexion with supports for collodion films, especially as one of the weakest points of this interesting department of our art is the liability of the collodion to become detached in development, or in the final washing, more especially the latter. This fact is one of the most perplexing character, when we bear in mind the varying moisture of the atmosphere and the constan change our chemicals are undergoing—the collodion especially which, on trial, may give excellent and permanent results, but after the lapse of a short time, may produce negatives sufficiently satisfactory, but which cannot be saved from destruction during final washing or drying. Of course this observation applies only to operations without a substratum.

The substances which have been found to be most efficacious as supports for collodion films are—albumen, gelatine, and India-rubber. For some time past the general favourite has been dilute albumen, rendered more fluid by addition of ammonia or acetic acid. This, in careful hands, answers every purpose; but, when it is used, every corner of the glass must be coated with collodion, or the nitrate solution will become contaminated—in fact, the action takes place through the collodion itself in course of time.

Next on the list comes gelatine as a supporting agent, Major Russell's formula being decidedly the best. It has been so minutely described in his work on *The Tannin Process*—with which it is supposed every photographer is familiar—that it requires no further comment here.

After careful experiments with all three substances on the foregoing list, I find a solution of India-rubber, of such a consistence as will readily filter, to be the most effectual and easy of application, flowing with all the readiness of collodion. In coating with gelatine or albumen the glass must be chemically clean, or either will be repelled by the surface, and cause subsequent difficulty and annoyance to the operator; but the solution under notice flows equally well on the glass, even after unlimited contact with the fingers, and without affecting the resulting negative. Not that any sane individual would either practise or recommend anything but strict cleanliness, but it is solacing to be enabled to ensure a perfect and adhesive surface with the minimum amount of trouble. Both Major Russell and many others complain that India-rubber films contract and split up on applying the necessary heat to varnish the negative. This difficulty may be entirely obviated by subjecting the coated plate, as soon as surface dry, to a considerably greater heat than is required, previous to using spirit varnish—bearing in mind not to continue it to such an extent as to produce decomposition, but sufficiently long to dissipate all traces of the solvent, leaving nothing but a coating of pure India-rubber to receive the collodion. The error of previous experimenters has been the subjection of the negative to a greater amount of heat than the foundation previously underwent. An addition of about one grain of common resin to each ounce of solution is also a further preventative against the evil in question, and it is then less dependent upon the thorough heating than without such addition. I find the best solvent for the purpose to be common coal tar naphtha—or equal parts of it—and spirits of turpentine. Benzole, although more agreeable to the sense of smell, is too volatile; which is also the case with chloroform, producing lines or streaks of unequal thickness, similar to collodion containing too great a proportion of ether.

What I wish to urge is the superiority of India-rubber as a support for collodion, on account of the following reasons:—The great facility with which it is prepared and applied; its unchangeable qualities, as after it is once properly filtered it never deposits sediment and keeps indefinitely; its complete neutrality, however long in contact with nitrate of silver; its insolubility in water and very slightly in collodion, so that the thinnest possible coat is only necessary; and, lastly, its independence of the state of the glass surface.

It is a well-ascertained fact that the nature of the surface receiving the collodion considerably affects the sensitiveness of the film. Most operators on ivory are aware that if the surface be slightly roughened the requisite exposure is less than when it is polished. Finely-ground glass gives a more sensitive film than its natural surface does. On the contrary, gelatine and albumen surfaces have a decidedly retarding influence. This is not the case with India-rubber, as may be demonstrated by the following experiment:—Coat the halves of three plates with each of the substances in question; make them into dry plates by any of the processes; expose and develop as usual, and observe the result.

The appearance of the half covered by the albumen is that of being less exposed than the half left bare; the gelatine presents a greater contrast still; while the India-rubber seems not in the least to have affected the result.

In what I have written I do not wish to claim any originality, my object being one of usefulness in calling the attention of my photographic friends to a valuable agent, the claims of which have been misrepresented through lack of the necessary amount of research.

ON WASHING POSITIVE PROOFS.

By George Shadbolt.

[Read at a Meeting of The Photographic Society (London), December 3rd, 1861.]

There are, perhaps, few photographic manipulatory operations that are looked upon as so excessively tedious as that of the final washing of the otherwise finished proofs. In fact, every kind of "dodge" has been resorted to in order to lessen its irksomeness, and, if the truth must be told, to shirk the trouble involved in a thorough removal of the last traces of the fixing agent, and what it holds in solution, and which, from its great solubility in water, requires an enormous amount of that fluid to be applied with no little judgment in order to effect the object in view. With most operators, the grand panacea for defective washing appears to be considered as existing in an unlimited supply of *running water;* but, apart from the injurious action which a very long continued immersion in water entails upon the photographic proof, by partial removal of the size from the paper and other deleterious influences, I am altogether incredulous about the removal of the double hyposulphite of soda and silver by any length of immersion merely, even in a running stream. I have frequently been called upon to give advice to those engaged professionally in printing operations relative to this very question, and have indicated a course of proceeding which, in no single case, have I found to fail, nor has any one who has tried it complained of it on account of inefficiency; but I am bound to admit that several have abandoned it because of the alleged extra trouble involved.

The plan to which I allude is the employment of many changes of water at moderately short intervals of time—say every ten minutes—but being careful between each change of water to hang up each print separately to drip for several minutes. By this operation the print becomes divested of by far the largest portion of the adhering fluid contaminated with the double salt of soda and silver, and is in the best condition, on its re-immersion into fresh water, to allow the small remainder of the deteriorated fixing solution to become still further diluted.

I am ready to concede that this plan entails some extra trouble; but the question is, whether the advantage gained be not well worth the trouble? I contend also that, in practice, the extra labour is not nearly so much as is generally supposed, while it must not be forgotten that the kind of labour requisite is not of any costly value, but little skill being demanded for its performance; and, in addition, it by no means follows that we may not by some ingenuity be able to reduce the amount of the extra labour, as we now please to regard it.

For suspending photographic paper while drying after any of the operations to which it has been submitted, I have for many years past made use of the wooden American clips, commonly used for clothes pegs, and which are procurable at the rate of about one shilling per dozen. By thrusting a common pin through one side of the clip, near the open end, and turning it into a hook by means of a pair of pliers, the clip itself can be readily suspended across a cord, wire, or slip of wood, and the paper proofs are not torn, but held between the jaws of the clip, just as they would be by the finger and thumb. I propose, then, to apply these American clips to economise our labour as follows, viz.:—after the first soaking of the proofs in water, when fresh from the fixing bath, I would hang each one up by aid of *two* of the clips—that is, one at each of the upper corners of each sheet—in such a manner that one angle of the sheet of paper should hang somewhat lower than the other, in order to assist the dripping of the fluid, which might be farther encouraged occasionally by the touch of a glass rod for a moment. A washing cistern, of a depth sufficient to receive the proofs in a perpendicular position, should be placed under a tap, and have a hole in the bottom near one of its corners, to let the water run out, and which can be stopped by a plug or by any other convenient method. Several metal or wooden rods, long enough to reach quite across the cistern, should be provided, and admit of being supported each upon a couple of hooks, at some little distance from a wall. As each proof is removed from the first washing water the two clips are to be attached, as already described, and these can be hung by aid of their pin-hooks on to the rods. Each rod may take six or eight proofs. When all are hung up the water in the cistern may be allowed to escape, and the cistern re-filled, during which time the proofs will be losing the water adhering to them; then the rod on which the first prints were hung may be taken up bodily with its suspended prints, and the latter lowered gently into the fresh water, the ends of the rods resting on the sides of the cistern.

I am aware that the prints will have a tendency to rise towards the surface, but by very little care they may all be made to sway in one direction; and as soon as one set is properly in a second rod may be inserted next to the first, and so on until the cistern will hold no more. By the time the last has been set in the first will have probably been in about ten minutes, and may be taken out again and hung up as before, and the whole operation repeated as many times as may be found needful—probably about a dozen times will be quite sufficient—so that in little more than a couple of hours a considerable number of proofs may be more thoroughly washed from the remains of the hyposulphites than are done by the present method in from six to twelve times as long a space of time. It is much to be regretted that we do not possess any reliable test for very minute quantities of the hyposulphites remaining in the prints. Personally I prefer that of the taste to any other. Nitrate of silver and nitrate of mercury have both been used; but I find that, long after I have been unable to detect any remains of the hyposulphites by them, after hanging up the print until surface dry the small remaining drop of liquid at the corner is appreciably sweet to the taste.

I am aware that a method of warming a suspected print is employed by Mr. George Dawson, the recently-appointed lecturer on photography at this College, when a slight scent of sulphur is detected by him; but I find my sense of taste more acute than that of smell.

I have frequently sought to devise some means by which the noxious hyposulphites might be converted into some innocuous substance capable of ready removal; but, unfortunately, this plan involves decomposition—the direst evil we have to dread, as it appears to be to the decomposition of the hyposulphite of silver that most of our spoilt prints are due.

I fear that I may run some risk of being charged with taking up your time with too trivial a matter for consideration, but I have done so upon the grounds that small annoyances by constant repetition become great evils; and I have found from experience that at this Society, as well as at some other societies, although the paper read may *per se* be of little value, it not unfrequently originates a discussion from which much that is useful and instructive arises. I will therefore conclude, with a hope that my very slight suggestion may do so upon the present occasion.

ON VIEWING BINOCULAR PHOTOGRAPHS WITHOUT A STEREOSCOPE.

By George H. Slight.

[Read at a Meeting of the Edinburgh Photographic Society, December 4th, 1861.]

As the convenient inspection of stereographs is intimately connected with photography, and as by far the most convenient way of looking at them is with the eyes alone, a few remarks on the subject may be of use to those who do not, and therefore think they cannot, see such pictures without a stereoscope.

The accomplishment—as it may be called—is a mere matter of training the eyes, without apparently doing any harm to them, and is very easily learned. When we use a stereoscope, both eyes are directed as if we looked at one object at a moderate distance from them; but by means of the prisms of the instrument the rays of light are bent, so that we are enabled in reality to look at two different pictures, which from being really or intentionally the exact appearance of an object as seen by both eyes combine and give us the idea of looking at the object itself. If without the stereoscope we look at a stereograph, adjusting the right eye to see the right-hand picture, and the left eye to the left-hand picture—or if, in a misplaced pair of pictures, as an uncut pair taken with a twin camera, we look at the right-hand picture with the left eye, and at the left-hand picture with the right eye—we have, in either case, correct stereoscopic vision; but, as with most people a little training and practice are necessary, I shall describe what appears to be as simple a method as any of accomplishing it. Take a pair of well-marked stereoscopic pictures, or a pair of diagrams, not joined together: place them considerably closer than if required for the stereoscope—say about two inches between centres—and hold them up at arms length, so that the eyes can be directed immediately over them to any distant object; then instead of two pictures we have indistinctly at first the appearance of three: each eye sees two pictures, but the inner ones of each pair combine or overlap and give the appearance of three in all. On allowing the eyes to leave the distant object and rest on the pictures, the middle one all at once becomes distinct, from the eyes focussing themselves to it, and a stereoscopic image is the result, the eyes being then directed to the different halves of the picture. If the half pictures

are misplaced, and held out as before, but the eyes directed to a real or imaginary object about half way between them and the picture, we again have the combination and correct stereoscopic vision. After a little practice no difficulty is experienced in looking at ordinary stereoscopic slides by simply allowing the axes of the eyes to diverge until the pictures combine. When any difficulty is experienced—as when the pictures are mounted too widely apart—the slide may be held obliquely until the parts combine, and then gradually turned to the square, the eyes readily adapting themselves to the varying circumstances.

A very curious phenomenon is observed when the eyes are thus used. If in holding up a pair of pictures to be seen by what may be called parallel vision, we gradually separate them, and cause the axes of the eyes to diverge more and more, the stereoscopic image appears to increase in size, probably from the instinctive connexion which exists between parallel and remote vision giving an idea that we are directing the eyes to a more distinct object; but in cross vision, with misplaced pictures, the gradual separation of the picture has the effect of making the eyes appear to look at a nearer and nearer object, and an apparent dimunition in size is the result. In either case the moving of the pictures several times nearer to and farther from each other makes the illusion perfect. The apparent reduction of size when looking at misplaced pictures by cross vision as compared with parallel vision is, indeed, evident at first sight; so that, although this is a very convenient way of judging of the stereoscopic effect of a negative taken by a twin camera, it gives an erroneous idea of its magnitude.

ON THE MANUFACTURE OF PYROXYLINE.

By JOHN NICOL.

[Read at a Meeting of the Photographic Society of Scotland, December 10, 1861.]

PHOTOGRAPHY—child of but a few years—has astonished all who have taken the trouble to think of it by the rapidity with which it has attained its present position. But this it owes as much to the time and circumstances as to anything of inherent expansive power in itself. Had the chemist, in his never-ending search after something new, not accidentally or otherwise discovered pyroxyline, and through it collodion—and, having discovered it, had he not been ready with his long list of iodides and bromides, photography would have been in a very different position.

An analysis of the Photographic Exhibition of last year in this city will perhaps show more clearly the relative position which collodion holds. On examining the published catalogue I find that there were 764 pictures. Of these one is by the calotype or iodised paper process, six are by the simple albumen process, 72 are by the waxed-paper process, and the remaining 620 are by collodion in some form or other. It will be evident that an article which plays such an important part is very likely to have been the subject of much attention, and such is indeed the case, more having been said and written on collodion than on anything else connected with photography—lenses perhaps excepted; and yet, I believe that there is nothing which the photographer uses about which less is really known, or which is less thoroughly understood.

Now it is not at present my intention to attempt anything towards the removal of this obscurity, but simply to indicate—first, the necessary conditions of a really good photographic collodion; and secondly, a simple and certain method of producing at will these conditions.

The collodion should flow over the plate in a smooth oily-like sheet, without any appearance of running in streams or ridges, and, as it begins to set or becomes slightly dry, there should be no trace of a clotted or gelatinons appearance. If at this stage the finger be passed across the surface, it should not tear the film from the glass in shreds, but remove only as much as it comes in direct contact with, leaving at each side straight and not jagged lines. It must not be contractile, so as to leave the edges of the glass or be pulled into a state of minute net-work on hardening. When perfectly dry it should present a hard glassy surface, which is not affected by a pretty firm rub with the finger—be perfectly transparent—and show no trace of structure under the microscope, with at least a quarter-inch object glass.

You will notice that the conditions alluded to are mechanical, not chemical; and, although photography is essentially a chemical operation, yet, I have no doubt whatever that the absence of those mechanical conditions is the cause of a large proportion of the failures which so provoke and dishearten the photographer. A good collodion is absolutely necessary to success; and, after an experience of some seven years in its preparation, I am convinced that the quality depends entirely on the pyroxyline, the iodising material being a matter of very little importance. Almost every conceivable iodide and bromide has been recommended, and our French neighbours especially have exercised their ingenuity in mixing them by the dozen; but I am perfectly satisfied that one is just as good as another, or as any combination—all that is necessary being sufficient of some soluble iodide to charge the film with iodide of silver. No doubt some of the objectionable qualities to which I have referred may be produced by some impure solvents, acid ether, or any undue amount of water in the alcohol; but ordinary care will be sufficient to guard against those causes, and therefore I may assume that with good pyroxyline good collodion is easily obtained.

Pyroxyline or gun cotton is obtained by the action of nitric acid of a certain strength upon lignine or cellulose, or more correctly on both—as the former term is applied to the substance of which the walls of the cells are built, and the latter to the substance with which the cells are filled. They are, however, so much alike that one term will answer very well for both. Lignine then consists of carbon, hydrogen, and oxygen, and exists in a state of considerable purity in paper, and almost perfectly so in cotton. What we know as "medicated cotton" is generally employed for the production of photographic pyroxyline; and, though many other things, such as paper, cloth, and sawdust have been tried, it is on the whole more generally successful.

If a tuft of cotton be immersed in ordinary commercial nitric acid, or even in acid of specific gravity of 15·00, it gelatinises and dissolves. If, however, sufficient sulphuric acid be added to withdraw a quantity of water from the nitric acid, no such change takes place, the cotton remaining apparently unchanged. It is only apparently so, however, as on being washed and dried it exhibits properties of which it was not before possessed. Its weight is increased sometimes by more than a half: it is soluble in acetic ether, and in a mixture of ether and alcohol, and on the application of flame it explodes with considerable violence, or burns with great rapidity. Pyroxyline thus obtained differs to a certain extent from what we are in the habit of considering a definite chemical compound, and belongs to the class of substitution compounds.

[After explaining at some length the nature of the chemical changes involved in the manufacture of pyroxyline, and illustrating the same by diagrams on the black board, Mr. Nicol proceeded.]

Practically we may divide pyroxyline into three classes:—First, one highly explosive, and scarcely, if at all, soluble in a mixture of ether and alcohol; secondly, one entirely soluble in that mixture, and leaving a strcutureless, transparent film when allowed to dry on a plate of glass; and thirdly, one which is almost entirely soluble, but which yields on drying a film more or less opaque. The first and last being useless in a photographic point of view, I will confine myself to an indication of the method which I have adopted for the production of the intermediate class, and one possessing not only solubility and transparency, but also the other essentials of a really excellent pyroxyline for photographic purposes.

It will be evident from what I have already said that the desideratum is to obtain a nitric acid of the proper strength. This is very easily done by adding a certain quantity of sulphuric acid to a certain quantity of nitric acid, when the former, in consequence of its great affinity for water, withdraws that body from the latter; and, provided the proportions and specific gravities are properly arranged, it gives us exactly what we require.

For a long time I experienced considerable difficulty in getting commercial sulphuric acid of sufficient strength, the samples ranging from 1·816 to 1·834: the latter, although theoretically strong enough, did not on mixing raise the temperature high enough, and from some cause, which I cannot explain, the temperature raised artificially failed to give the desired result. Latterly I have had no difficulty in obtaining it from 1·840 to 1·850, which leaves nothing to be desired.

Into a well-glazed porcelain dish, considerably deeper than an evaporating dish, and holding about 30 ounces, I put 10$\frac{5}{8}$ ounces by measure of sulphuric acid of specific gravity 1·840: on this I pour five fluid ounces of nitric acid of specific gravity 1·370, and two fluid drachms of water. The temperature at once rises to about 150 degrees. If the cotton be immediately immersed, it gives what is known as "powdery collodion"—a state similar to what is produced by age, and very suitable for certain dry processes; but for general purposes I let the temperature fall to 140 degrees, and then, armed with two glass rods, an assistant adds, tuft by tuft, five drachms of good cotton. As each tuft is added it is pressed

nto the acids, and the whole kept moving about to ensure equal action. When the whole of the cotton is in, the dish is covered with a plate of glass, and left so for ten minutes. It must, however, be carefully watched during this time; for the acids being not much above the dissolving point, actual solution occasionally begins at some point, but is immediately stopped by being pressed with the rods. Although the five drachms of cotton does not absorb the whole of the acid, that quantity must not on any account be exceeded. The change taking place being the conversion of portions of the hydrogen of the cotton and the oxygen of the nitric acid into water, the addition of a single half drachm is sufficient to change the nature of the product, and occasionally to produce solution of the whole. At the expiration of ten minutes, I as rapidly as possible press the cotton between two strong slips of glass, and plunge it into a large quantity of water, where it is instantly teased out and rapidly moved about to diffuse as quickly as possible the adhering acid through the whole volume. Nothing then remains but to wash till every trace of acid is removed. This is conveniently done by packing in a percolater, and turning on a stream of water for a dozen hours, and drying either by steam or otherwise.

It may seem that the quantity of material operated on is small, but experience shows that larger quantities considerably affect the result. But that is really no great objection, as with two dishes and an active assistant the pyroxyline may be turned out at the rate of five ounces per hour.

The sulphuric acid which I use at present has a specific gravity of 1·50, to each ten ounces of which I find an addition of three drachms of water to be necessary. I recently commenced a series of experiments with a view to determine whether this held good all through—that is, whether it might be safely affirmed as a rule that success would be ensured by the addition to the formula already given of six minims of water for each additional unit of specific gravity above 1·840 of the sulphuric acid. I regret, however, that want of time has prevented these experiments being completed. Probably I may have an opportunity of again bringing the subject before you on some future occasion.

STEREOGRAPHS.

Views in Derbyshire, Yorkshire, &c.

Photographed by THOMAS OGLE, Preston.

IN this series Mr. Ogle, one of our most noted stereographic artists, has even surpassed his former beautiful productions, and has made his *debut* in delineating a class of subjects which we do not remember to have hitherto seen as the fruit of his labour—we mean those requiring instantaneous exposure. We will therefore begin with them.

The first that demands our notice is a subject that reminds us very strongly of the celebrated picture by Le Gray, so popular a few years ago: it consists of a small sloop afloat in the ENGLISH CHANNEL, OFF FOLKESTONE, the waters of the sea rolling in towards the shore in gentle wavelets bathed in a flood of sunshine, against which the sky, mottled with fleecy clouds, appears dark by contrast. Though very beautiful when viewed in the stereoscope it appears sombre without, and like Le Gray's picture reminds one more of moonlight than sunshine, albeit highly artistic. It bears the No. 226.

In No. 265—SCARBOROUGH, *scene No. 2 on the Beach*—the sky with natural clouds is perfectly rendered as being in unmistakeably broad daylight, but the exposure has evidently been a trifle longer than in the last mentioned, as shown by the slightly blurred outline of a rowing-boat in motion. As a picture of coast scenery, with numerous boats of various kinds, figures, &c., it is capital.

Nos. 262 and 270 are more SCARBOROUGH Beach scenes—the former looking upon the castle from the bay, and the latter from the north shore. This last is a very successful slide, containing views of the bathing-machines, groups of donkies, with ladies and children in various attitudes familiar to frequenters of the seaside.

But perhaps the best of the instantaneous scenes, whether as regards manipulation or composition—for both are really first-rate—is one entitled THE RAILWAY-BOAT, THE IRISH MAIL-BOAT, AND SHIPPING ON THE MERSEY, No. 224. The grouping of the shipping is very picturesque—the water clear—the sky, with a few clouds, brilliant—and the steam pouring out of the funnels of the Irish mail-boat transparent and real in the extreme, veiling—and only slightly veiling—the ships in the distance seen through it.

Pass we now to landscape scenes of a character with which Mr. Ogle's name is more familiarly identified; and here we have one which we could pick out as his work from amongst a thousand.

No. 248, ON MILL BECK STOCK, BOWNESS, is one of those glorious masses of foliage enclosing a stream of limpid water skipping from rock to rock that every artist and lover of nature revels in with delight. As a composition this slide is admirable. The figure of a youth stepping across the stream forms the centre and focus of the whole. On either side the stream, shrubs of the alder, ash, beech, holly, and other kinds, together with undergrowths of ferns, &c., clothe the banks. Beyond the lad, further up the gorge, a background of the stems of some tall trees half shuts in the distance, which, however, is partly visible, consisting of more and yet more shrubbery, with here and there just a speck of sky. The immediate foreground consists of a mass of broken, rugged, lichen-covered rocks, splitting the little stream into numerous channels, and here and there a tuft of grass springs up with its long, graceful, feathery flower, more gorgeous in beauty than any court lady's plume. In this beautiful specimen everything is sharp, clear, and distinct, yet all harmonious and in perfect keeping, and without loss of either "breadth" or atmosphere. There is scarcely a particle of pure white in the whole picture, yet for all that it does not lack brilliancy: it is about as nearly perfect as anything in monochrome can be.

Of DOVEDALE—charming, although it must be confessed somewhat sloppy, Dovedale—that Derbyshire lamb-like lion—we have several pleasing illustrations. In No. 215 the tortuous windings of the RIVER DOVE between the high, rugged, but verdure-clad rocks, as seen from REYNARD'S CAVE, are well displayed, and the whole scene is highly picturesque. Those who would see the reality have to encounter a pretty stiff climbing job, with somewhat treacherous foot-hold. In No. 312, where the river is broader and the banks less precipitous, there is a beautiful play of light and shade. No. 311 contains the singular rocks in the Dale called THE TWELVE APOSTLES, and No. 316 the equally singular and still more pleasing ones known as TISSINGTON SPIRES. This subject is very artistically treated: the contrast between light and shade is of the strongest; yet, deep as are the shadows, they are beautifully transparent and full of detail. In the middle distance a gentleman is seated, looking up at the so-called "spires," and in shadowed foreground stands an old woman, whom we recognise as having seen close upon the same spot, in charge of a donkey or two, for the benefit of those ladies who are too delicate or too dainty to traverse the Dale on foot, soaked to the skin, as they must in that case of necessity be, so far as the lower extremities are concerned. These slides will, if viewed by those who have not been on the spot, make them take the first opportunity of visiting it; and to those who have already been there they will recall most pleasant memories.

There are two very charming scenes at MATLOCK BATH—one (No. 294) being a general view of Matlock Dale from the HEIGHTS OF ABRAHAM. There are two slight drawbacks to this otherwise pleasing slide:—first, the atmosphere was at the time of its exposure a little too much laden with moisture; and second, from the great elevation at which the operator stood the light from the sky is reflected too strongly from the tranquil surface of the river Derwent, thereby introducing a somewhat "patchy" appearance. Nearly this same view taken from the garden of the Pavilion Hotel would be more effective. No. 397, THE LOVERS' WALKS, *from the Ferry*, is, however, a gem. A splendid oak tree, by the river's edge, on the left—the huge block of stone and ivy-clad hovel in the centre—the tall Tors in the background—with the mass of alders and other trees nestling at their bases, and here and there a willow drooping into the river—compose very harmoniously.

Those who have ever visited BUXTON cannot fail to recognise many nice views in the public gardens in that museum of gossip, idlers, and invalids. Nos. 156 and 170, THE SERPENTINE WALKS, are perhaps the best.

With one more we must close the present notice. No. 292, VIEW IN CHEE-DALE, looking north, is a capital illustration of the way in which the hard rock has been worn through by the water, the bare sides of the rock standing almost or quite perpendicularly out on each side of the Dale. A party of ladies are visible on the soft turf, and a mass of coltsfoot on a mud island in the centre is a prominent object. The whole of the slides are printed in Mr. Ogle's well-known brilliant manner.

ON PHOTOGRAPHIC DISTORTION.*

By Robert H. Bow, Civil Engineer, Edinburgh.

Having calculated the positions of the points of emission, A', L, J, and H, and the values of the angles which the emitted rays make with the axis, the results given in the tables are obtained thus:—

In Table I.—The results given in the first line are the values to which the several radii are contracted, as determined by the tangents of the angles of emission alone, and therefore for a value of D F very great, or infinite. The second line of results gives the absolute amounts of distortive contraction, obtained by subtracting the values in the first line of results from the respective undistorted values, viz., 1, 0·75, 0·5, and 0·25. The third line gives the per-centage value of the distortions, obtained by multiplying the values in the second line by 100, and dividing by the undistorted values of the radii. The fourth line gives the values of the index n, calculated with reference to the ray nearest the axis, $r \propto$ absolute distortion. The fifth line gives the per-centage value of the contraction in the direction of the radius, as it acts at the extremity of the radius, or the proportion of radial distortion which would be produced on a very small object placed at the distance r from the centre of the picture: these values are those in the third line multiplied by the values of n given in the fourth. The sixth line is similar to the third, and expresses the proportion of lateral distortion of a body at the extremity of a radius, and is only $\frac{1}{4}$th the amount of the radial distortion. But it may be proper to give here the modes of arriving at these results.

By the results given in the second and third lines we see that the absolute contractions of the radii vary nearly as the cubes of their lengths, and that the per-centages of contraction are therefore nearly as the squares of the lengths. But, to be more particular, let us put n to represent the index of the power regulating the absolute contractions which therefore $\propto r^n$: now if we conceive r to undergo a very slight elongation $= \Delta$, the absolute contraction will be increased from r^n to $(r + \Delta)^n$ or becomes $=$ $r^n + n\,r^{n-1}\,\Delta + \frac{n-n}{2}\,r^{n-2}\,\Delta^2 +$ &c., and deducting r^n, we have $n\,r^{n-1}\,\Delta + \frac{n^2-n}{2}\,r^{n-2}\,\Delta^2$ &c., which expresses the contraction expended upon the part Δ added to the radius. Now as Δ may be assumed smaller and smaller without limit (by the principles of the calculus of infinitesimals), we may neglect all but the first term, so that the absolute contractions of r and Δ will be as r^n and $n\,r^{n-1}\,\Delta$, and the proportionate contractions, or per-centages of distortion, will be obtained by dividing these by their respective lengths r and Δ; therefore the per-centages of contraction are as r^{n-1} and $n\,r^{n-1}$, so that the proportion of radial contraction at the extremity of a radius will be n times greater than the general rate of contraction throughout that radius, as in the table.

We have chiefly spoken of that distortion which takes place in the direction of the radius of the image. We have now to speak of the distortion in a direction at right angles to the radius. Now the per-centage amount of this *lateral* distortion (as we may term it) will evidently correspond with the per-centage of change produced in the whole circumference of the circle described by the radius, and will, consequently, be in proportion to the per-centage of distortion estimated over the whole length of the radius, and this has been shown to vary as r^{n-1}. We thus arrive at the conclusion that in the case of a small body at the extremity of any radius, the per-centages of distortion of that body in the two directions—first, of the radius, and second, at right angles to the radius—will be in the proportion of n to 1, or nearly as 3 : 1. For instance, if a small circular body exist at a distance from the centre of the subject, then in the photographic picture the image of that body would show a compression in the radial direction about three times greater than in the lateral direction. This will be observed in the case of the square and circular objects A B C D becoming *a b c d*, shown in *Fig.* 4; but these objects are too large to give the proportions very correctly.

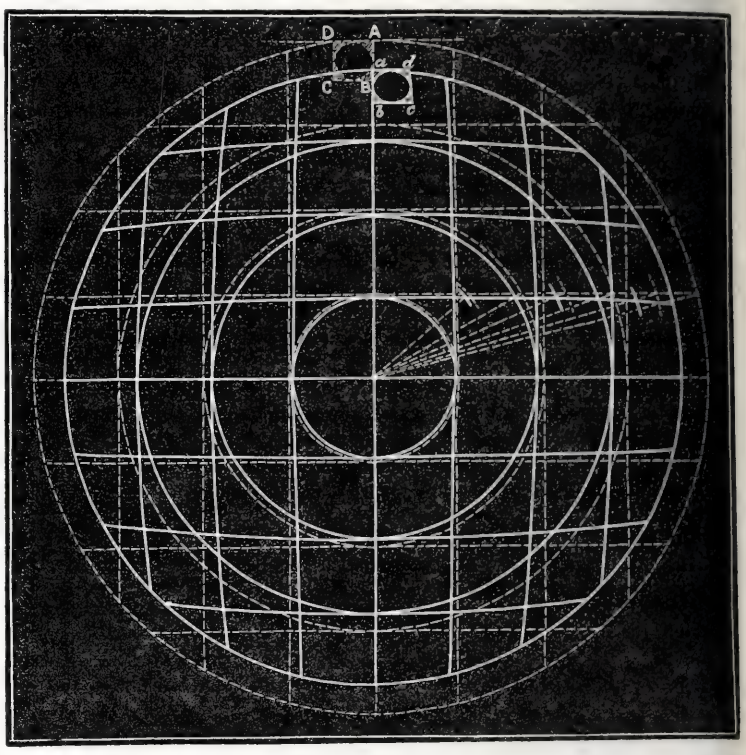
When the distance D F is very great, the effect of the distance from the centre at which every ray passes through the lens may be neglected, so that the ratios of distortion become simply those of the tangents of the inclinations of the rays after their passage through the lens, and these are the ratios employed in Table I. But when the distance D F is not great, we must take into account the effect of the distance of the ray from the axis at the lens. When D F is very short the amount of distortion becomes insignificant; so that it is evident that for every lens there is a range in the ratio of distortion dependent upon the value given to D F, and varying from that borne by the tangents taken above down to zero. Their intermediate ratios, required for the comparisons in Table II., are obtained thus:—The length of any radius, F T, of the image (see *Fig.* 3) is equal to L V + L T' × tan. of T L T'.

* Concluded from page 419.

FIG. 4.

Diagram of the distortion produced by a plano-convex lens with a focus equal to about $3\frac{3}{4}$ times its diameter. Angle of incidence of extreme rays = 30°. Index of refraction = 1.5, $n = 3$. The undistorted image, drawn according to the scale of the centre, is shown in broken lines: the distorted image is shown in continuous lines. The radial distortion at extreme circle = 30 per cent. Ditto measured over whole of longest radius = 10 per cent. The lateral distortion at extreme circle = 10 per cent.

Note.—In reducing the diagram to the size of the woodcut the *curvature* of the lines has been made too great.



And when O A = 2, and R the radius of curvature of the lens = 3, the amount of refraction by the second surface is so trifling that, though it is taken into account in arriving at the inclination of L T, we may adopt this more convenient formula for F T:—
F T = K D + D F (tan. of inclination of L T).

The comparative results in Table II. are for the purpose of showing the power which one lens possesses to counteract the tendency to produce distortion in another placed on the other side of the same stop. And we see that when the amount of distortion produced on the radius drawn to the extreme standard ray by one lens, at the distance D F measured—say to the chart—is equal to the amount produced by the other lens at the distance at which the plane of the copy is placed, then the combination is almost perfect in its action upon the intermediate spaces also, and is sufficiently so for all practical purposes.

From Table II., Example 2, we see that if we use the two lenses with the radii = 3 and 4. Then when the object is at an infinite, or say a great distance in front of the 4 rad. one, the image will be free from distortion if made to fall on a screen placed 12·15 behind the 3 rad. lens. Such an arrangement might be used for taking views, if there were any great object in having them so thoroughly undistorted. We may make our unit of measure for this purpose equal, say, to three-eighths of an inch. Then the lenses would have diameter = $\frac{3}{4}$" inch, and each 0"·6495 from the stop, and the picture at 4·556 behind the more powerful lens. The radii of curvature would be = 1"·$\frac{1}{2}$ and 1·$\frac{1}{8}$. Of course a negative arrangement would have to be introduced at the stop.

If only the lens of radius = 3 were used, with the stop and flat side towards an object, *at any distance*, and the picture formed at 5 behind the lens, the principal radius would suffer a contraction amounting to 7·676 per cent.: if formed at 10 behind, the same would be distorted to an extent of 9·213 per cent.: and if we suppose it to be formed at a very great distance behind the lens, the distorting contraction would amount to 11·523 per cent. Of course the per-centage of radial contraction at the extremity of the radius would be n, or nearly three times the above.

These results and the diagram, *Fig.* 4, will serve to convince us of the very great amount of distortion existing in photographs taken with plano-convex lenses; and I think it will be admitted that the amount of curvature in the lines gives us a very inadequate idea of the excessive amount of radial contraction which is produced on a body situated near the margin.

We have shown that it is possible to correct the distorting tendency; but, to bring about the very nice arrangements required when the flatness of field is brought into the question, we confess that there appears little hope of any universal instrument being constructed to suit for copying charts to any scale. The case No. 1, in Table II, is given, however, to show that we are not called upon to change the value of R, the rad. of curvature, for every change of scale; for, by placing one lens nearer to the stop, we *virtually* lengthen its focus, or rather diminish its distorting power compared with the other lens, and a considerable range of scale may thus be attempted. It is probable, however, that the various changes would become so troublesome and complicated, that it would be better to construct a separate instrument for each particular scale; and, before concluding, I have another arrangement to propose suitable when a separate instrument is to be devoted to each particular scale—a combination in which the correction of distortion is mathematically perfect, and the calculations very simple.

One use to which the results in Table II. may be turned is, to warn us of the imperfections of some arrangements put forth as producing pictures free from distortion. Thus, if we take two lenses, say each with R = 3, with the stop and negative arrangement exactly midway between them—which, I believe, correctly represents Mr. Sutton's symmetrical triplet—then, if the chart and the copy be on the same scale there will be no distortion, since the distances are equal; but if the chart be at a very great distance, and the image or copy at, say 5, then the distortion on the longest radius will be equivalent to an increase from 0·884014 to 0·92324, or about 4.438 per cent. on the radius, or a marginal

radical distortion $= \frac{76{\cdot}97 - 65{\cdot}20}{65{\cdot}20} \times 100$, per cent. = 18·05 per cent. Or, taking a less extreme case, let the respective distances of the copy and chart be 10 and 50; the extreme radii will be as 0·907873 to 0·890314.

Per-centages of contraction on the radii = 9·2127 and 10·9686.

Per-centage of enlargement of radius

of copy $= \frac{0{\cdot}907873 - 0{\cdot}890314}{0{\cdot}890314} \times 100 = 1{\cdot}97.$

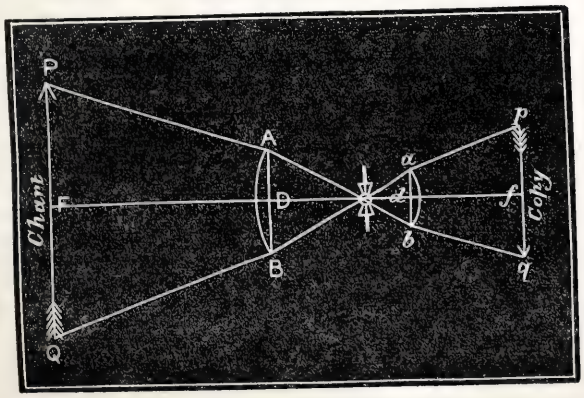
Per-centages of radial contraction at margin = 27·638 and 32·906
Difference = 5·268

Radial scales for margin = 72·362 and 67·094.

Per-centage of marginal radial enlargement $= \frac{5{\cdot}268 \times 100}{67{\cdot}094} = 7{\cdot}84.$

In proposing such a combination Mr. Sutton [see *Photographic Journal*, 1860, p. 58] takes for granted that, when the emitted rays are made parallel to the corresponding incident rays, there is no distortion. But this ignores altogether the effect of the size of the lens, and is only true, in the case of the lenses being exactly alike, when the scale of the copy is equal to the original, or when both chart and copy are at great distances from the lenses in proportion to their common diameter.

FIG. 5.



MR. BOW'S CHART COPYING LENS.

The combination which I propose for copying charts, &c., is as follows:—

Suppose that the copy is to be in size $\frac{1}{m}$th of the original. Then I make all the dimensions and distances of the parts on the *chart* side of the stop equal to *m* times the corresponding dimensions and distances on the *copy* side of the stop. Thus in *fig.* 4 we have $p\,q = \frac{1}{m}$ P Q, F $o = m \cdot of$, A B $= m \cdot ab$, Rad. of lens D $= m \cdot$ rad. of lens *d*, D $o = m \cdot od$.

The introduction of a negative lens at O will not affect these *ratios;* but I hope to arrive at a combination, such as *fig.* 6 (the lenses being still *similar*), which will give a flat field without the use of a negative lens at the stop.

In arranging for a given number of scales it will not be necessary to use double that number of lenses, as one lens may in turn be employed in combination with several of the others of similar forms but of different dimensions.

FIG. 6.

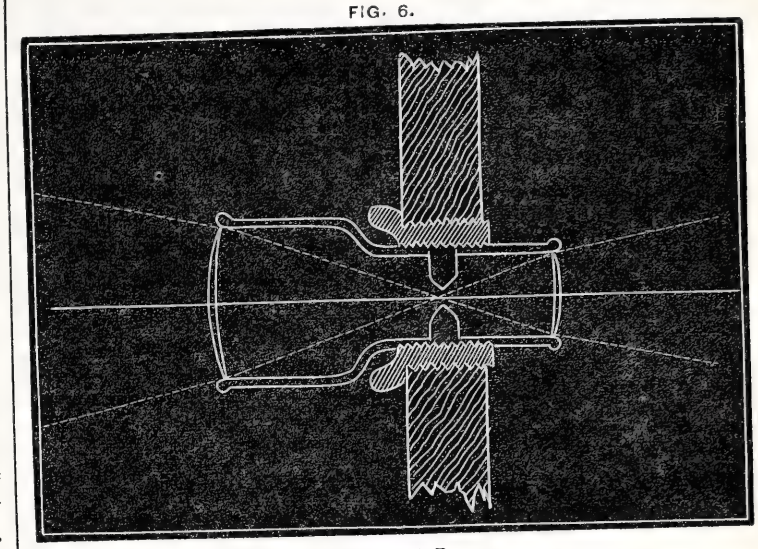


TABLE I.

OF RESULTS DESCRIBED AT PAGE 440.

Radius of Curvature of Lens and its Distance O D from Stop.	Particulars given.	Lines.	PF = 1	TF = 0·75	RF = 0·5	UF = 0·25
Rad. = 3.	Values of radii when D F infinite	1	0·8846	0·6994	0·4850	0·2480
O D = 1·732051	Absolute cont. of radii	2	0·1154	0 0506	0·0150	0·0020
	Per-centage of conts. over radii	3	11·54	6·74	3·00	0·78
	Value of *n*	4	2·94—	2·96+	2·937	say 2·94
	Radial cont. at margins or ends of radii	5	33·90	19·97	8·80	2·30
	Lateral do. at do. ...	6	11·54	6·74	3·00	0·78
Rad. = 3.½	Values of radii, D F infinite	1	·9259	·7172	·4903	·2486
O D = 0·8660255	Absolute cont. of radii	2	·0741	·0328	·0097	·0014
	Per-centage of conts. over whole radii...	3	7·41	4·38—	1·94—	0·57
	Value of exponent *n*	4	2·85—	2·83	2·76	say 2·8
	Radial contraction at end of radii.....	5	21·12	12·39	5·35	1·60
	Lateral do. at do. ...	6	7·41	4·38—	1·94—	0·57
Rad. = 4.	Values of radii, D F infinite	1	·9045	·7081	·4878	·2484
O D = 1·732051	Absolute conts.	2	·0955	·0419	·0122	·0016
	Per-centage of cont. over radii	3	9·55	5·59	2·43	0·64+
	Value of exponent *n*	4	2·95	2·97	2·92	say 2·94
	Radial contraction at end of radii.....	5	28·17	16·60	7.10	1·88
	Lateral do. at do. ...	6	9·55	5·59	2.43	0·64+
Rad. = 6.	Values of radii, D F infinite	1	·9275	·7187	·4906	·2488
O D = 1·732051	Absolute cont. of radii	2	·0725	·0313	·0094	·0012+
	Per-centage of conts. over radii	3	7·25	4·17	1·89	0·49+
	Value of *n*	4	2·94—	2·94+	2·93	say 2·93
	Radial contraction at end of radii.....	5	21·32	12·26	5·55	1·44
	Lateral do. at do. ...	6	7·25	4·17	1·89	0·49+

TABLE II.

Of series of contracted radii of the image produced by different lenses, arranged to show the degree of accuracy with which the distortions—at different distances from the centre of the picture, produced by one lens—may be corrected by a second lens placed at the other side of the stop, when the distances of the object and picture, the foci of the lenses, and their *distances from the stop are all properly adjusted.*

The diameters of all the lenses are taken = 2, and all are plano-convex.

The usual distance of the stop from the flat side of the lens= 1·732051, or such that the extreme ray passing through the stop is inclined at 30°

The index of refraction = 1·5.

Distance of Stop from the Lens.	Radius of Convex Side of the Lens.	D F, or the Distance of Object or Image from flat side of nearest lens.	Extreme Ray at 1. from centre. Angle = 30°	Third Ray at 0·75 from centre. Angle = 23° 2′·48.	Second Ray at 0.5 from centre. Angle = 16° 6′·127.	First Ray at .25 from centre. Angle = 8° 1′·979.	REMARKS.
	∝		1·0000	·7500	·5000	·2500	No distortion.
1 1·732051	3	4·515	·9259	·7175	·4904	·2487	
1 0·866026	3	∝	·9259	·7172	·4903	·2486	The rays cross this lens at only half the distances (from its centre) stated at heads of columns.
2 1·732051	3	12·15	·9045	·7081	·4876	·2484	
2 1·732051	4	∝	·9045	·7081	·4878	·2484	
3 1·732051	3	7·34	·9141	·7123	·4888	·2484	
3 1·732051	4	20·	·9141	·7120	·4888	·2484	
4 1·73205	3	4·25	·9275	·7182	·4906	·2488	
4 1·73205	6	∝	·9275	·7187	·4906	·2488	
1·73205	3	5·00	·9232	·7163	·4900	·2487	
1·73205	3	∝	·8846	·6994	·4850	·2480	

A PROLOGUE FOR THE SEASON.

By Valentine Blanchard.

[Read at a Meeting of the South London Photographic Society, December 12, 1861.]

In the good old times, when good Queen Anne was on the throne, no play was considered perfect without its prologue and epilogue. In these modern days, however, they are quite out of fashion, and are stowed away on the musty shelves of the bygones. Is it that we have no Popes, no Addisons, no Goldsmiths to write them? or is it that they might raise expectation too high, and call attention to the literary shortcomings of the modern drama? We will not pursue this investigation further, but we think we may with propriety borrow the word for our remarks. At every annual meeting we have what we will call the "Epilogue" in the Secretary's report, but thus far we have had no "Prologue."

Now, I do feel strongly impressed with the conviction that all societies like ours might with advantage devote the first meeting of the season to an introductory address, briefly reviewing the past, but more especially chalking out in bold outline the course for the future. In the discussion which would follow this address many new suggestions would be made, some of which might be adopted with great advantage, and might tend to throw new life and vigour into the meetings of the Society, giving at the same time increased pleasure to the members.

I cannot help feeling that hitherto the course of our photographic societies has rolled on too smoothly in the well-worn track of routine; and the time has come when we may, with advantage, seek out new paths, even though the road may not at first be quite so smooth—at least there will be the charm of variety, which will tend to shake off the drowsiness and banish the listlessness into which some of us have fallen.

If we glance at the early history of the Parent Society, we shall find it had its origin in the efforts of a few photographic enthusiasts to remove the patent restrictions which held our beautiful art in the chains of bondage. All honour to them for their successful labours. The names of some of them have become as "familiar in our mouths as household words," and others of them, alas! are gone from us. They too, however, have left "foot-prints on the sands of time." Years have rolled smoothly on since the London Photographic Society first commenced its labours, and it has gradually grown into a goodly body; but it has scarcely, to my thinking, used well the means at its disposal. The tendencies of the age are ever onward, and woe to those who lag behind! I would like to see the Parent Society the *avant courier* of photography, and not a Lord Mayor's coach, broken down by its own stateliness.

If we look at the origin of our own small—not very small—Society, we shall find that our worthy Secretary was maternal and paternal progenitor, nay, even godfather and godmother as well. We all owe him much for his untiring labours; but I do think some of us mistake the way to show our gratitude. In all seasons we find him at his post, nothing keeps him from his duties—not even the terrible wind which Dickens tells us always roars with tenfold fury at Walworth. That he is right we all know; for on one or two occasions last season the speakers could scarcely be heard, so lusty was the voice of Boreas in spite of his hoarseness. No, Wall had plenty of the cement of the Roman in his frame, and was therefore always to be found—the right Wall in the right place. I am sure, then, nothing would repay him for all he has done for us so completely as a regular attendance on the part of the members at the meetings of the Society. I think we can all look back with pleasure to the past season. The attendance, however, was not uniformly good. Some meetings brought but a scanty array of members. Now I do hold it to be an imperative duty on the part of all who join a Society like ours—where some of the body put themselves to no small amount of trouble for the pleasure or instruction of the rest—I hold it to be a duty, I repeat, resting on each individually to repay the reader of a paper for his trouble by being present. Surely this is not too much to give him for his labour. I have felt this so strongly to be a duty, that during all the time I have belonged to the Society I have been absent but twice, and then I was a hundred miles away.

We all know how easy it is to frame excuses for our absence. We are only too ready to say—"I do not feel much interest in the subject for to-night's meeting;" or—"Well, really I did think that subject was used-up by this time: I shall hear nothing new, so I will e'en stay at home." Or we look, perhaps, at the state of the weather, and find the wind is in the east, and blows with something more than the breath of a zephyr through the balustrades of the bridges, and with a shuddering twitch of the shoulders at the picture conjured up, and a vigorous poke at the fire to drive off the sensation, we readily enough determine to remain at home, and stifle any qualms of conscience by a promise made to ourselves to read carefully the report of the meeting. If we were, however, to put ourselves into the shoes of the disappointed essayist when he sees but one pleasant *Wall* and four blank ones as a greeting, we should let nothing but illness keep us away.

But whilst I cannot help condemning strongly the indifference displayed by some of our members—and I fear the fault is but too common in other societies besides our own—I believe a cause may be found without much difficulty.

I can conceive nothing more pleasant or enjoyable than a photographic gossipping club, where every one can come within the magic, genial circle, and cast in his scrap of information for the general benefit, without a feeling of apprehension and fear of that most dreaded individual, the reporter, which, I feel assured, takes possession of the boldest of us. I can speak from experience here; for I never get up to make a remark without feeling a palpable fog—a London one in its completeness—stealing gradually over my mental faculties, and the subject which stood before me clear as noon-day has now assumed, in consequence, such a strange, distorted appearance, that I myself can scarcely make out the outline; and as for colouring, or details, alas! they are entirely lost to me. To resume, then: in such a friendly circle as I describe each one speaks with freedom, and in the comparison of notes each one is in turn a gainer; for I do not believe that photographers are, as a rule, miserly over their knowledge. I have, it is true, occasionally met with a man with a book, carefully guarded, filled with precious secrets, each one of which is worth its weight of chloride of gold; but he has invariably shown himself a veritable *Marall*, whose boasted photographic gems are but spoiled paper

and wasted chemicals. I fear, however, this pleasant gossiping club would scarcely prove practicable where the number of members is large. I do think, however, a little of its geniality could be introduced into our meetings to thaw the slight frost sometimes felt, and which I fear chills some of our members. Let it not be understood that I desire to depreciate the importance of meetings like the present. Such is not my object; but I do think it possible to introduce some new features which may enhance rather than lessen their value.

I would like the Experimental Committee to be a Committee of the entire Society; for I feel assured that the members generally would be benefitted by the change. During the past season I heard of the labours of that body but twice. If my memory serve me rightly only two reports were laid before the members, one of which was passed as read; that is to say, the members were referred to the journals if they were desirous of learning the contents of that report. I would have a subject announced for investigation. Let it be some new process to test, or some old photographic paradox to clear up. No matter what the subject, let there be sufficient time allowed for experiment, and then on the evening appointed for discussion each member could come prepared with the results of his researches. We might then reasonably anticipate a very animated and pleasant evening—the more so if the subject chosen could be well illustrated by comparative results. If it were possible to make the experiments in the presence of the members it would tend in no small degree to clear up many of the conflicting statements that now exist on many photographic subjects. This, at present, in most cases, would be impracticable. If members would, however, find time for experiment, and set themselves to work, faithfully recording their failures, at the same time carefully preserving their results for comparison at the meeting, we could not fail to be gainers, and the subject would, in consequence, awken the interest of all the members.

My great desire, however, is to see classes for the study of chemistry and optics organised in connexion with the Society.* I do not think this proposition will be regarded as impracticable, for we have already amongst us men whose attainments in these two sciences stand deservedly high; for not only are they well versed in the theory, but they have daily to combine it with practice. I feel assured these two gentlemen would gladly aid us in our endeavours to make this Society more thoroughly educational than it has hitherto been. The future of all photographic societies should lie in this direction; for how invaluable to all engaged in the practice of photography would be a knowledge of chemistry and optics. Now, the professional photographer has few opportunities for the acquisition of a knowledge of these sciences beyond the fragmentary information which presents itself to him in the course of his labours. Chemistry is not easily learned by solitary study: it is always more easily taught in class. Besides, the expense is an important consideration. When, however, it is shared by the many, the difficulties are at once removed.

I feel assured that no one here will underrate the importance of a knowledge of chemistry to all photographers. I know there are some few who will say sneeringly—"Well, I don't care about so much theory; give me the practical part." They, however, seem to lose sight of the fact that they are very much in the condition of the child in the mother's lap—they are helpless until the food is put into their mouths. Such men eagerly swallow all that comes in their way, and then snarl by way of payment. No, we all owe much to the chemist for his patient, plodding labours, and for his microscopical powers of observation; and we long for the time when we can follow him in his labours, and fully understand his power of producing those combinations—the language of which, like the chords of a grand symphony, can be written in characters wholly unintelligible to the mass, presenting to the eye of the uninitiated a confused combination of figures and letters—strange hieroglyphical signs, totally without meaning, but which, when once the key is obtained, presents a succession of harmonies ever new and varied, but so beautiful in their variety that the beholder or listener never wearies. The photographer without a knowledge of chemistry is like the man who plays upon an instrument without understanding music, or rather like a man who talks but cannot read. He knows collodion is collodion, but ask him to spell the word or point it out when he sees it in print and he stands mute and helpless. We long, however, for the time when, instead of standing up as dunces not knowing all our letters, we shall be enabled to read the language of chemistry with al fluency that shall be as perfect as that of the accomplished musician when he glances over the sheet of music, or with the same ease that we would read an ordinary book. That this time will come I do not doubt. Let us do our utmost to bring about its speedy approach. It is possible to make photographic societies more educational in their efforts. Let us all do our best, and the mountain difficulty will become a mole-hill. I look upon efforts in this direction as stepping-stones to something still higher. If the isolated labours of patient men have done so much for photography, what may not be accomplished in the future, when every earnest photographer is a tolerable chemist, understanding well the uses of the tools placed in his hands! There is no limit to the possibilities of the future. If men, single handed, have done so much in clearing up the mists which enveloped photography in its infancy, and which are by no means entirely dispelled now, what may not a body of patient workers, made up of different organisms—the enthusiast, the wary lover of proven facts, and the brilliant theorist—what may not such a body do, made of such opposite materials, but all actuated alike by a deep, devoted love of photography! We can place no limits on the future. The wild dream of to-day becomes the commonplace fact of tomorrow. But a few years ago and we had a lord—one of whom England is justly proud—ridiculing the insane notion of burning smoke at the end of a long pipe; and yet today the thing is so common that we never bestow a thought upon it.

I ardently long for the time when there shall be a photographic society so high in its standing that wealth shall have no key able to unlock the door, and when only those can gain admittance who have proved themselves worthy by their known attainments. The members of such a society might, with just and honest pride, write F.P.S. at the end of their names. The formation of the classes I have mentioned would be a step in the right direction, and would tend to make this dream of the future a bright reality. Gentlemen, my Prologue is over.

* Such classes have already been established in connexion with the Edinburgh Photographic Society. See report of that Society in another part of this number.—Ed.

PHOTOGRAPHIC COMPETITION AND MOONLIGHT PICTURES.

By John Cramb.

I was a little disappointed by the article on this subject in the last number of The British Journal of Photography, by Mr. J. T. Brown, Jun. I was really very sorry to see that he had on many points so completely misunderstood me.

In my article *On Photographic Competition* I have said very little about the Birmingham Exhibition, and *not one word about the judges.* The aim of my article was to show that the offering of medals at Exhibitions had not been beneficial to them. After instancing the Edinburgh Exhibition as having suffered rather than benefitted by the offering of medals I said—"Again, only lately the Birmingham Society announced the intention of holding an Exhibition, and awarding medals for certain classes of pictures. Instead of a large collection, fully representing the position of the art, the Committee could not get as much as would make a decent opening till long after the advertised time; and, even after two months' persistent application to the photographic world for contributions, it was a complete failure, both as regards quantity and quality—perhaps the most meagre Exhibition ever opened."*

I had not the most distant idea of blaming any one, but meant—and I think clearly said—that the plan of offering medals had, I thought, been injurious. What can Mr. Brown mean by saying my article impugned the character of the judges appointed? I never even mentioned the subject of the judges at Birmingham. I could not have done so; as, if I am not much mistaken, there never was any intimation of either who the judges were or any notice of their award till the appearance of the notice in the last number of this Journal. I have no doubt Sir F. E. Scott is all Mr. Brown says he is, and I have formed a very high opinion indeed of Dr. Anthony. These gentlemen were, no doubt, "the right men in the right place" when acting as umpires in a photographic competition. Who ever hinted anything else? That is the part of Mr. Brown's charge which I am most anxious to repel. Things that are in their nature matters of opinion we need not expect all the world to agree upon; but, as I never alluded to the judges at the Birmingham Exhibition, I must insist that it is very wrong to say that I impugned their character, or directly or by implication cast any reflection on the award made by them.

As to giving any explanation of what I meant by calling the Birmingham Exhibition "perhaps the most meagre exhibition ever opened," I have merely to say that I thought it so; and

*See The British Journal of Photography, page 405.

why I hold such an opinion will, I think, appear by reference to the catalogue. I never for a moment *meant* to blame the Birmingham Photographic Society for this result. I intended to charge the evil as against the plan hitherto adopted of offering medals. If I were wrong in doing so, Mr. Brown should rather, I think, have pointed out the true cause. He *does not*, after all, deny the *facts* stated in my brief notice as given above. It would have been more to the purpose if he could have done that. The readers of the Journal did not require to be told that if I had sent pictures to the Exhibition that the *quantity* would have thereby been increased, and *perhaps* the *quality*. That sneer I am content simply to repeat.

Let me now, in a few words, dispose of the rather violent attack on me in regard to my remarks on Mr. Breese's pictures at that Exhibition.

Before doing so let me say that Mr. Breese is not to be in the smallest degree held liable for the present discussion regarding his pictures. It may be that he is indifferent to all that has been written respecting them. He may esteem it as merely so much gossip of the photographic busy-bodies; and it may be that this discussion causes him much pain and annoyance. Mr. Breese himself has not written, or in any public place said, a word about his pictures. As the lawyers would say, he is not "in court" at all. It is necessary to keep this in mind, because I think it bears on the questions at issue.

Without further comment let me see what I am reported to have said. Referring to Mr. Breese's pictures, Mr. J. Cramb said:—"If that gentleman had a process by which he could take pictures by moonlight, he submitted the question—Why were there so many figures which had moved in his so-called instantaneous views of the Queen's visit to Birmingham, though it was evident they were done with the full aperture of a double lens, there being only a small part in the centre in passable focus?"*

The reader should easily understand my meaning. I supposed that all Mr. Breese's pictures were done by one new, very *rapid* process. I was justified in supposing so. All the pictures had been mentioned in one batch through the same medium. In fact, the views of the Queen's visit were first spoken of by the editor of a contemporary as wonders of instantaneous photography. My question was a most pertinent one. How has it been met? By denying my *premises* that there were figures *which had moved*, and that a double lens was used? No! But by explaining that these views of the Queen's visit were *not*—what the critic called them—instantaneous, and done by Mr. Breese's quick process, but that they were produced *four* years ago. The meaning of this statement I understand to be that the process Mr. Breese now uses is different from the one employed in producing these views of the Queen's visit. The statement has no meaning at all if that be not the signification. If that be Mr. Brown's meaning my question is answered, and the apparent difficulty raised by it is removed. I did not say I absolutely doubted that Mr. Breese had taken the moonlight views or could take them; but I expressed, by a question, my astonishment that if he could take moonlight views why could he not take views in full sunlight instantaneously?

It is to be regretted that Mr. Breese has not, in his own person, come forward with a plain, intelligible statement of what he can do by his improved process. I know that many most successful and enthusiastic amateur photographers are averse to publication; and I can scarcely say it mends the matter that sometimes their views are drawn out of them in private circles, and then without their consent published more or less correctly by some hearer—an editor or his friend it may be.

Mr. Brown complains that I pass over Mr. Breese's other excellent pictures, and instances the *Power's Court Waterfall*. I did not intend to give an expression of my estimate of the value of Mr. Breese's productions. I may say that I think them very creditable, but much injured by the injudicious and indiscriminating flattery of the editor to whom I have already made allusion, and by whom I have been during the last twelve months systematically vilified, for reasons with which it is needless to trouble your readers; but he could not be engaged in a more hopeless task than that he seems to have appointed to himself. He cannot hurt my feelings, not possessing the weapon necessary to reach my self-respect.

Let me, in conclusion, ask why Mr. Brown makes so much of the few words uttered by me? The editors of *La Lumière* and THE BRITISH JOURNAL OF PHOTOGRAPHY have more directly impugned the accuracy of the statements about Mr. Breese having executed moonlight views. Why allow them to escape and arraign me before the London Photographic Society, as he did at the late meeting of that body? I am not vain enough to think he values the effect of my remarks as more injurious than the articles of the two gentlemen named. No! I can but think that he (to use a Scotch proverb) wishes to "loup the dike whare it is laighest." I pray him not to try again, lest he may find that it is quite high enough for him to get broken bones in the descent.

† THE BRITISH JOURNAL OF PHOTOGRAPHY, page 412.

NEW METHOD OF STRENGTHENING NEGATIVES.*

By M. JOURDAIN.

HAVING read in the *Bulletin de la Societé de Photographie* the remarks of MM. Davanne and Girard on the dangers of employing poisonous substances in photographic manipulations, I have intended for some time past writing to you to request you to communicate to the Society a method of advantageously replacing the perchloride of mercury, which is a highly poisonous substance; but I desired first to ascertain whether my process was already known.

After having employed all the ordinary means to thoroughly develop my proof on the negative, after removal of the iodide of silver and thorough washing with common water, when I require an unusually dense and "hard" negative, fit for the reproduction of an engraving (that is to say black and white), I cover the negative alternately with solution of sulphide of potassium and sulphate of iron, being careful to wash with abundance of water between each operation.

I obtain by this process negatives with *reserves* or darker portions so opaque that one cannot see the sun through them, and which, consequently preserve perfectly the whites of the positive proofs, leaving an image so clear and transparent that the positive proof appears as if produced with printer's ink.

* From *La Revue Photographique*.

PALESTINE IN 1860;

OR, A PHOTOGRAPHER'S JOURNAL OF A VISIT TO JERUSALEM.

By JOHN CRAMB.

No. XII.

(Concluded.)

THE DEAD SEA—THE JORDAN—JERICHO—RETURN TO JERUSALEM.

THE last number of my notes left me descending into the valley in which the Dead Sea lies. Very extraordinary ideas we all had of that sea. I had heard the most frightful descriptions of the deadly miasma floating over it. I could not say that I had any clear idea in what the horrors and dangers of an approach to it would consist; but I had some vague and dreamy notion that it was a very "naughty place." What did I think of it as the reality lay before me? "It looks rather pleasant," we said to each other. "Not unlike a Scotch loch," remarked one of my clerical companions. There is a great absence of vegetation, though. The background of hills lack variety of outline and elevation, and there is no individuality in the hills. It was pretty hot, but not at all intolerable, and we felt no very unpleasant sensations. As we approached the lake, nature seemed everywhere making a desperate effort to produce vegetation. Everything was parched and stunted in appearance. Sheikh Salih busied himself collecting berries, which he politely presented to me, at the same time partaking of some himself, as if to assure me that they were wholesome.

When within about half a mile of the Dead Sea, we dismounted—I to take my view, and the rest of the party to lunch. The whole of the southern and western border of the lake was enveloped in a dense mist. I determined, alone, to try a view across the northern end of the lake, with the Moab mountains for a background, and showing the mouth of the Jordan.

After I had exposed my plates, and, as I hoped, had secured the image of this mysterious sea, I determined on carrying to my distant home a more material witness of my visit, in the shape of a bottle of the water of the lake. Having filled it and picked up a few of the more marked stones on the beach, we were soon in the saddle again, with our horses' heads directed towards the ford of the Jordan—the traditional site of the baptism of our Saviour, and of many other important Scriptural events. I shall attempt no description of the Dead Sea, but so far as it came under my own observation. There is room for much investigation and research here. The American expedition, under Lieut. Lynch, has supplied us with nearly all that we know of a truly reliable character. To that narrative I would refer my readers.

As we rode across the plain, I particularly observed the very numerous heaps of *sand—dust* is the more correct word. These were of considerable height—formed, in some measure, like the avalanche. Some little obstruction in the plain stopped a portion of the flying dust, and it accumulated in various spots, till the huge masses we saw were the result. That is what has become of the once fruitful *soil* of the plain of Jericho. Thus the smiling garden has become a barren waste!

Some failure in my saddle stopped me for a short time. The Sheikh kindly waited to see all right, and we had a good-natured race to get up with our companions. As we approached the Jordan, we seemed to be riding up to the base of perpendicular hills. A bright green belt of very close vegetation was pointed out as forming the banks of the river. What increased force we saw in the language of the Psalmist, where he refers to the flourishing character of the tree planted by the river! And in the sudden transition from the parched, barren plain, to the luxuriant river's bank, we have the answer to the question as to whether there is any impediment to the growth of a plentiful harvest on this now desert waste. Plant and irrigate it, and the plain of Jericho will again become as "the garden of the Lord."

Arrived at the ford of the Jordan, we again dismounted. I was promised to be allowed to remain an hour. The Sheikh seemed very uneasy, and, long before the allotted time, was urging us to re-load and make ready for departing. I soon had my camera in position, and took several views—one of which included the muleteers, the Sheikh and his man, and the rest of the party. That turned out my last stereo., and it was the one which was published.

The River Jordan at this point is of considerable extent—perhaps about 400 feet in breadth, and it is pretty deep. The water is so sweet and agreeable to drink I had two bottles of it filled; and I was able to bring both of them, and also the bottle of water from the Dead Sea, uninjured to this country.

After leaving the Jordan we turned in a nearly due westerly direction towards Jericho. Our Sheikh had a fright and so might we had we understood the danger. Soon after we got from under the cover of the trees along the Jordan we saw something resembling human beings, over some distant sand-hills. Well, thought I, and what of it? Our Sheikh, however, felt uneasy. Giving some hurried instructions to our chief muleteer to keep the baggage animals together, off our protector rode in one direction, his attendant having before gone in another. There were but a few minutes of suspense; for, as we rode silently forward in single file, we saw that Sheikh Salih had come up with the imaginary robbers, and that he and they seemed to be on friendly terms. I was informed that it was a party of Bedouins carrying some prisoners to their camp. We rode through them, and found our Chief had dismounted, had spread out his mat, and was going through his devotions. As I approached he saluted me—as I learned—praising God for our deliverance. My American companion sneered at him as a canting hypocrite, saying that the whole was a *ruse* to make us think highly of his protection. I could not thus think of him. There he stood, his honest, manly face expressive of gratitude to his God and Father. I learned from my interpreter the Arabic words for "God be praised," and, as well as I could, repeated them. The Sheikh joined me in uttering them, and we again repeated them together. He was pleased with my confidence, and I shall never, I hope, be ashamed of having joined in the expression of heart-gladness with this faithful, free son of the desert.

We arrived at Jericho just before sunset. Our tent was soon pitched. It was too late for us to see anything of Jericho. As we approached it we had looked for the palm—the solitary palm—which we had learned remained the last of what had gained for it the title of the "City of Palm Trees." There was not a vestige of one to be seen.

A message was brought to us that the chief man of the village desired the honour of our company. I rather unwillingly complied; for I felt more disposed for sleep than to attend a levee. We went, however, and found him in the midst of what I suppose must be called his courtiers. A very dirty and ragged congregation they certainly were! His Highness of Jericho has no fine palace: he receives his guests under the canopy of heaven, and, for economy's sake, just outside the village coffee-shop. He ordered coffee and pipes for us, which he never paid for, we believe: the *café* keeper paid himself by the return order we gave. There was no attempt at providing seats for us. Down we all squatted on mother earth around the blazing fire, which illumined the faces of the motley group. To remove the very appearance of anything like doubting them, we had left all our servants at the tent. A very extraordinary picture this group would have made. I felt very sorry that I could not speak Arabic, and not much less so that I could not smoke. I did not care either for their coffee. I did, however, drink it: to have refused would have been dangerous. One of our party spoke Arabic well, and could smoke and drink coffee and eat all sorts of things nearly as well as the Arabs themselves. He produced cigars for the Governor and some of his attendants. They tried to smoke them as he did. Our friend smoked their pipes; and thus we fraternised with perhaps as lawless a set as one would care to meet. We bade them good night, and made for our tent. I soon undressed and got to sleep. The Arabs outside my tent were amazed as they saw me undressing. Very foolish and unnecessary they thought this operation.

In the morning I was early astir. I took views of the village and plain—not an over comfortable place to work in, it proved. The Sheikh had gone in the evening, and left his brother and some attendants to protect us. It never occured to me, when I went out to take my view, that I would require them with me. Off I went with my camera. They had been watching my movements; for, ere I had chosen my position for a view, I found my protectors were around me, and that a very large congregation of the other thing from which I required to be protected had arrived also. What a jabbering, ragged, thievish-looking crew they were! I soon perceived that the Sheikh's man was very careful to lift every article I laid down and; I was manifestly afraid of those who surrounded us, counting time as I best could, not daring to show an article, so interesting as a watch. Those were the most knavish-looking fellows I had ever seen; yet even they were afraid of their lawful rulers—their chiefs. Had I been working a wet process it would have been a hundred-fold more difficult, and might not have been easily accomplished at all.

I returned to our camping ground and found all the baggage packed; but the tent had been, by my orders, left standing, as I wished to have a stereo. of it and its "surroundings." I hurriedly set the cameras and stepped into the door of my tent, after having uncovered the lens. My dragoman shut it up.

About nine o'clock we left Jericho for Jerusalem—a bad time for travelling; but I had no choice except to wait another day. I was, however, anxious to get to Jerusalem to develop my views.

In all the journey from Bethany till we got to Jericho we had never seen a human habitation. When we left Jericho we would not see a house till again near Bethany; for there is not now even an inn to which a good Samaritan could take a poor wounded traveller who had fallen among thieves. About half-way there are the remains of some habitations, said to be the ruins of "the inn." I suffered a good deal for want of water on my return journey to the Holy City. I was generally very easy on this point—quite able, in fact, to endure the deprivation of it as long as any of our Arabs. My companions hurried in advance of the baggage, which took me away from my dragoman and the water supply. Bitterly did I regret it, as I was afterwards rather ill, resulting I believe, from having drank some bad water, which, but for my excessive thirst, I would have rejected. My clerical companions had wine and brandy, both of which were useless to me.

I arrived in Jerusalem about three o'clock, but too tired to do any photographic work. It was a day before I could get my pictures developed. I found I had been overdoing the damping of my plates. I had several failures in consequence, which much discouraged me. I was soon almost dangerously ill, and had to cease all work. I was, however, glad to find, on summing up, that I had a *view* of every place I tried secured. Where failure had taken place was where I had exposed several plates. Were I to go over the same ground again I could, in every respect, be much more successful. I cannot but feel pleased that I was, so far, successful. The Jew photographer had been several times at the Dead Sea and the Jordan with wet collodion, and yet had no view of either the one or the other. Another, and very successful, British photographer, whose views in the East are deservedly admired, had not secured a view of the Jordan; so I took encouragement, and my health became better. I needed it all. My dragoman—poor fellow!—got worse as I got better. I am afraid he drank too much wine. Temperance is a health-preserver anywhere, but peculiarly so in warm climates.

I now for the present hurriedly bid my readers good-bye. I had hoped to have carried my narrative throughout the rest of my journey in Palestine, and return to this country. I have, however, fulfilled the title of this series of papers, and given "A Photographer's Journal of a Visit to Jerusalem.

Scraps and Fragments.

PHOTOGRAPHIC BOOK ILLUSTRATION.—We are pleased to notice that in the *National Magazine*, part LXII, for the present month, an article on "Ripon Minster" is illustrated by a small photograph of the Cathedral, to which the names of Messrs. Frith and Hayward, of Reigate, are appended.

PHOTOGRAPHY FROM AN "OUTSIDE" POINT OF VIEW.—The constant reference to photography in the current literature of the day tells a tale of the manner in which our art has, as it were, permeated all sections of society; but it is amusing to notice the odd mistakes that frequently occur amongst the uninitiated. For instance, in the *Reading Mercury*, we find the following:—

"PHOTOGRAPHY.—A very interesting discovery has been made in this art, in the preparation of the glass negatives by the "dry" process. It is now found that the negatives can be prepared and will maintain their *sensitive* surfaces between two and three months unimpaired: hitherto failures have been constant. This result has been secured by Mr. ——, of —— Street."

No doubt the worthy Editor imagines his fellow-townsman to be a great discoverer—probably as much to the astonishment of Mr. —— as anybody else; but only fancy any one having *just discovered* how to keep "dry plates" sensitive for a few months! Again: in Mr. Dion Boucicault's new play, "The Octoroon," a murder is supposed to be discovered by the accidental impression made upon a daguerreotype plate of the persons engaged in the act of committing the crime, in consequence of a camera having been set up on the spot and blown down immediately after the deed. Such trifles as developing the image are not considered, neither the fact that no one was present to close the camera after exposure, to say nothing of the plate having been exposed long enough to spoil fifty plates before the deed could have happened!

In a critique on one of Mr. Thackery's works, noticed in the *Athenæum*, we have the following:—

"There is a superstition amongst many people that photographs are likenesses, and that, however hideous the result may be, the photograph only brings to light the ugly possibilities that lie dormant in the individual. Again, there is a notion that caricaturists produce the strongest likenesses; it being essential to the success of caricatures that every one should 'recognise them at a glance.' In both cases candid friends mildly insinuate against the 'vanity' which protests against accepting the award. It is always easy to understand a dashing exaggeration; it saves trouble both to the artist and the public, and spares the skill and patience necessary to produce or to discern the delicate shades of the *poco meno e poco più* needed to make a genuine portrait."

This is scarcely fair to photography. *Good* photographs are likenesses, and the very best of likenesses too, though we are fain to admit that many of them are nought but hideous libels on humanity. It is that insidious enemy, the truth—but not the whole truth—that is told in the above extract; but we presume the writer would say *si non è vero é ben trovato.*

HUMPHREY'S (AMERICAN) JOURNAL OF THE DAGUERREOTYPE AND PHOTOGRAPHIC ARTS.—It is with pleasure that we find our contemporary makes the *amende honorable* for what we regarded as a serious offence. The following is extracted from his number of the 15th November:—

"THE BRITISH JOURNAL OE PHOTOGRAPHY.—The Editor of the above-named valuable periodical is respectfully informed that we do not intend, in any instance, to copy an article from his pages without giving the customary credit, and we follow the general custom of New York journals in our manner of giving credit. Where a series of articles by the same writer is continued from number to number we have been in the habit of crediting the source when the series is completed, if we have not previously done so at the commencement of it. This has been the habit of this Journal always, and was never before excepted to.

"We are quite ready now, and at all times, to admit the fact of our indebtedness to our contemporary for many valuable extracts from his pages, and are glad that he has at his command the services of so many talented writers on photography."

It is not always that we find a person convicted of error who has the courage to repair it, and, therefore, the more gratifying when it does occur. We cordially extend the hand of fellowship to our brother editor; and we are convinced that he will perceive that the omission of acknowledgment at the *commencement* of a series is of far more importance to us than at its close; besides, the articles extracted of which we made special complaint were each, to some extent, complete in themselves. We are, however, now satisfied that our contemporary's omission was not at any rate intentional.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

THE second meeting of the Session was held at King's College, on Tuesday evening, the 3rd instant. H. White, Esq., occupied the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were elected members of the Society:—Messrs. H. Greenwood (Liverpool), — Cole, John Tawse (Madras), Jacob Montefiore, White, and Henry Castleman.

The CHAIRMAN then announced the names of the officers and members of Council who retire in accordance with Rule 7, and also read the list of names of the gentlemen nominated by the Council to fill their places, viz.:—

Recommended by the Council for retirement:—

Vice-President—Professor Bell. Six members of Council—Dr. Arthur Farre, Messrs. Bedford, Crace, Delamotte, Maskelyne, and Stokes.

Recommended for election:—

Vice-President — Mr. Bedford. Council — Professor Sedgwick, Dr. Wright, Messrs. Vernon Heath, Glaisher, Joubert, and Robinson.

For *re*-election:—Treasurer—Mr. Hamilton.

The SECRETARY then read the following letter he had received from Mr. J. T. Brown, Jun., Hon.-Sec. of the Birmingham Photographic Society:—

Birmingham Photographic Society,
December 2nd, 1861.

DEAR SIR,—I intended being present at your meeting to-morrow evening, with some of Mr. Breese's stereographs, particularly his views of the moon; but, at the last moment, I am prevented. I should have been more annoyed at the delay but that I hope ere another meeting of the Society to be able to lay before the members a view (or views) of the moon, taken either by myself—aided, of course, by the appliances of Mr. Breese—or by Mr. Breese, in my presence. Although I have no doubt in my own mind that the pictures are what it is pretended they are, viz., views of the moon and clouds, taken by the light of the moon at midnight—in one case through an open window of a room, at which sits a lady whose features are not more than a silhouette, though the lace sleeve and ornaments upon the table upon which she rests her arm are distinctly rendered in every detail—still I wish to remove any shadow of suspicion that may attach to Mr. Breese in consequence of his being so backward in explaining the means by which he produced them; but when I tell you that he is an amateur, and has spent a very large amount both of time and money in bringing his ideas to perfection (though he does not so think them), I do not think he is called upon to lay his ideas before the world without any recompense. He has a very strong objection to give any explanation whatever until he has completed his experiments; and this is the main ground for his remaining so quiet upon the subject, coupled with his generally unobtrusive manner. The question of their being instantaneous I have disposed of in my reply, in THE BRITISH JOURNAL OF PHOTOGRAPHY, to the remarks of Mr. Cramb, of Glasgow. Regretting not being able to make your acquaintance to-morrow evening,—I am yours, faithfully,

H. Diamond, Esq., M.D. JOHN T. BROWN, *Hon.-Sec.*

Mr. VERNON HEATH presumed he should not be out of order if, before the commencement of the business of the evening, he asked permission to put two questions to the Secretary. The first was in reference to an answer in the last number of the Society's Journal with respect to the Annual Exhibition of the Society. He would ask what were the intentions of the Council of the Society on that subject? The object of the second inquiry was to ascertain what had been done in the interest of photography in connexion with the International Exhibition of 1862? He thought the time had come for the statement of something certain on that point.

The SECRETARY replied that the Council of the Society had duly considered the subject alluded to by Mr. Heath, and had determined that there should be no Exhibition by the Society during this session. Mr. Foster had been appointed to superintend the arrangements connected with photography in the International Exhibition. He would be aided by a Committee of three gentlemen, viz., the Earl of Caithness, Mr. Kater, and himself (Dr. Diamond).

Mr. VERNON HEATH asked if any other gentlemen had been invited to join the Committee besides those named by the Secretary?

The SECRETARY replied that the gentlemen named formed the complete Committee.

Mr. VERNON HEATH said that it was then too late to discuss the question as to whether the best means had been adopted for the furtherance of photographic interests: if the Committee were then complete, he would urge upon the gentlemen composing it the importance of well-directed efforts, and wished to draw attention to the advantage which would accrue from their soliciting and obtaining the aid of the best men of other societies, who, by the exercise of their united judgment and experience, would ensure a result which all present must feel to be desirable, namely, that British photography should be well represented in the Great Exhibition of 1862.

The CHAIRMAN stated that in the photographic department 2,400 square feet of space were applied for by 250 applicants.

Mr. THOMAS ROSS was then called upon to read a paper descriptive of the

Panoramic Lens and Camera.

I HAVE this evening the pleasure of laying before the Society a complete set of the apparatus necessary for the production of panoramic photographs, 10 inches in length, and including an angle of upwards of 100 degrees.

The set of apparatus consists of a plate-box for one dozen plates, a holder for the curved plates while being cleaned, a water-tight bath with dipper, a camera with lens and tripod-stand, and a printing-frame, all packed in a varnished pine case, with handles, and secured with lock and key.

The plate-box has slanting grooves suitable for plates of the required curve.

The holder for cleaning the plates consists of a flat base-board, surmounted by a curved board lined with cloth, to prevent the glasses from breaking or being scratched. At one end of the board is a fixed overlap of wood for the plate to rest against; at the other end is a hinged flap, which enables the manipulator to clamp the plate safely and securely whilst it is being cleaned.

The bath, which is made of gutta-percha, is curved rather less than the plates for which it is required, to prevent the collodion film from being injured during immersion. The bath is rendered water-tight by means of a wooden top, lined with India-rubber, firmly compressed to it by three brass clamps. There are occasional objectors to the use of gutta-percha baths; but, in order to meet the wishes of these objectors, I am in treaty with a manufacturer for the production of curved glass baths; these will of necessity be more costly and more weighty than gutta-percha ones, to the latter of which I must confess I see no objection when they are made of pure material.

The plate-dipper, which has the form of an elongated horseshoe, slightly hooked at the extremities, is made of strong metal wire, thickly coated with gutta-percha. A dipper made of pure silver, or of brass wire thickly electro-plated, might be employed if preferred.

The stand is the usual folding tripod, with triangular brass top, to which the camera is fixed by a bolt passed through the camera and clamped under the triangle.

The printing-frame differs from ordinary frames in its being curved, and in its having inner shoulders thickly lined with India rubber upon which the negative plate rests. The back-board, which is hinged in the middle, presses three or four thicknesses of soft pliable flannel against the excited paper, and is kept in position by two strong springs in cross bars, hinged at one end and hasped at the other. With this, as with the flat frame, the operator may with the greatest facility examine the progress of the print without the least danger of displacement.

The camera and lens require a more minute description, which will now be given in detail.

The camera has a sliding body, which is adjusted by a screw motion at the back, and secured in adjustment by a clamping screw on the top of the camera. As it is important to place the camera parallel to the plane of the horizon, two spirit-levels, placed at right angles, are fixed in the top of the camera: by this arrangement the camera may be placed in a proper position with more facility. The camera has a sliding front, to which is attached a square box, with a hinged shutter, fitted with a clamping screw. This shutter, which acts as a cover to the lens, may be used both for instantaneous photography and for regulating the amount of exposure required by different parts of the subject: it acts as a shield to the upper portion of the lens, and may be made to obstruct the rays from the sky, thus enabling the operator to produce fine effective clouds on a sufficiently exposed plate. It is scarcely necessary to state that both the plate-holder and the ground focussing-screen have the exact horizontal curve of the field of the lens.

I now come to the description of the lens, which is unquestionably the most remarkable part of the apparatus; and I think I cannot do better than quote the words of the inventor, as contained in that portion of his specification which relates to the form of lens which I have the honour of exhibiting this evening.

"My invention relates to the construction of a compound achromatic lens for taking photographic pictures wherein an unusually wide angle of view or extent of field is to be included. The compound lens is composed of two single, thick concavo-convex lenses, made of glass, the curved surfaces of which are portions of concentric spheres. They are secured to a suitable mount in such a manner and position that the curved surfaces of both of them (that is to say, all the four curved surfaces) are concentric, their common centre being a point in the axis of the compound lens, and the lenses having their concave surfaces opposite to each other. In the space or cavity between the concavo-convex lenses is contained a transparent fluid of lower refractive and dispersive power than the glass of which the lenses are made. Water is a suitable and convenient fluid to employ. By assigning proper radii to the surfaces of the glass lenses, the compound lens is rendered achromatic and convex, so as to produce real images of objects. The two glass lenses may be made of the same kind of glass, and equal in all respects, but that is not a necessary condition. By using lenses made of different kinds of glass, and giving their concentric surfaces suitable radii, computed according to known principles of optics, the compound lens can be made achromatic, and, at the same time, its spherical aberration can be reduced. The compound lens is provided with a central diaphragm, having a central circular aperture of suitable size in order to give sharp definition when objects at different distances from the lens are included in the view. This diaphragm is placed between the lenses and within the fluid in such a position that the centre of its circular aperture is at the common centre of the spherical surfaces of the lenses."

The description of the diaphragm (so very insufficient in the specification) I shall give from Mr. Sutton's paper read at the last meeting of the British Association, held at Manchester in September last:—

"The central diaphragm is another curious part of this instrument. It is evident that, if it were merely furnished with a central circular hole, the sides of the picture would be less illuminated than the centre. To meet this inconvenience I have made the central hole elliptical, and have placed in front of it two upright thin partitions, radiating from the centre, and looking like the open wings of a butterfly. These stop some of the light of the central pencil and make it cylindrical, and at the same time they make the side pencils cylindrical also, and of the same diameter as the central one. This simple contrivance answers perfectly in equalising the illumination."

I now turn again to the specification; but may here remark, that although the lens before you is substantially the same as that described by the inventor, it somewhat differs from it in this respect, that the mounting has been improved and simplified. Mr. Sutton, describing the lens with its original mounting, continues in his specification to state that the simplest form (by-the-bye, the best form) of panoramic lens and mount is that in which the glass lenses are both alike in all respects, and made of the same kind of glass. When this construction is adopted, and the internal cavity filled with water, the lens will work with sufficient accuracy for most practical purposes, if the following dimensions are employed, viz., if the lenses are both composed of the same light flint glass, their inner radii may be one-half the length of their outer radii; if they be made of the same colourless crown or plate glass, their inner radii may be two-fifths of their outer radii. Each lens is fitted into a metal ring, provided with an external screw-thread, for the purpose of screwing them fluid-tight into the intermediate ring or zone, provided for that purpose with internal screw-threads at each end. This zone slides freely within the boss of the flange, by which the entire lens is secured to the woodwork of the camera, the sliding motion serving to facilitate the adjustment of the focus. The cavity between the lenses is filled with water or other suitable fluid, the ring being provided for that purpose with stoppered inlet and outlet apertures.

I will now take leave of the specification, and observe that, as the camera has sufficient screw-adjustment, a sliding adjustment to the lens becomes unnecessary, and has therefore been dispensed with. The stoppered apertures have also been done away with as unnecessary for filling the lens with water, which operation may easily be effected in the following manner:—Unscrew the front component of the lens, then pour perfectly clear water into the reservoir till the water reaches the brim, and slightly agitate the water to expel the air, then screw on the front lens. The small bubble of enclosed air which has not been got rid of will rise much above the spherical concavity of the lens, and thus become of no consequence. The brass mounting is made with so much accuracy that the lens, when screwed up, is perfectly water-tight.

Some persons have supposed a certain amount of difficulty to exist in coating curved plates with collodion. There is, however, no real difficulty in the matter. If Mr. Collis will be good enough to coat before the Society a few of the curved plates I have brought with me, he will be able to show you with what facility the operation may be accomplished, and if any of the members present will try the experiment they will find it exceedingly easy.

I beg to say, in conclusion, that I shall now have the pleasure of submitting to your inspection the first panoramic negatives taken by Mr. Harral, in order that you may judge what amount of success a first attempt may meet with.

I must apologise for again introducing some prints which have already appeared before you; but as there may be some members present who were not here at the last meeting, it may afford them some gratification this evening to obtain a sight of the panoramic prints.

Mr. Ross exhibited the apparatus in explanation of his paper.

The Chairman, on the conclusion of the paper, asked Mr. Ross if any means had been devised whereby the curved glass negatives yielded by Mr. Sutton's camera could be rendered flat?

Mr. Ross replied that there had not, but it had been suggested to him that it would be a great convenience if the film could be floated off and spread upon a flat glass or waxed paper. In reply to a question by the Secretary he (Mr. Ross) stated the price of the curved glasses to be 18s. per dozen.

The Chairman proposed the usual vote of thanks to Mr. Ross.

Mr. Shadbolt then read a paper *On Washing Positive Proofs*. [See page 437.]

Mr. Vernon Heath said that he had been for some time past following a plan very similar to the one suggested by Mr. Shadbolt for washing his prints, and could consequently corroborate that gentleman's remarks in every particular. There was this slight difference in his method of manipulating, namely, that, after he had submitted the prints to what he deemed a due amount of soaking and changes of water, he (Mr. Heath), to "make assurance doubly sure," placed each print on a plate of glass, holding it at an angle of 45° under a copious stream of water from a tap. He was acquainted with a gentleman who washed his prints by placing them in a square box, lined with porcelain slabs, the box itself being sunk beneath the river which flowed through the garden. He (Mr. Heath) must say that, though a *continuous* change of water was thereby secured, he could not think it was as *complete* as by Mr. Shadbolt's method, which was one he could cordially recommend to photographers as being one which, if adopted, would be found productive of great good, and in his estimation conducive to the permanence of the photographs.

Mr. Sebastian Davis said that he had found it advantageous, in washing the print after removal from the pressure-frame, to do so by floating the print on the surface of the water rather than by complete immersion,

as in this way the free nitrate of silver was more completely removed through the establishment of downward and upward currents in the fluid, so that the paper was exposed to a constant accession of fresh water uncharged with nitrate of silver; and this, he thought, was carrying out the same *principle* as was involved in the method of washing proposed by Mr. Shadbolt, and so warmly advocated by Mr. Heath.

Mr. MARTIN, in allusion to a remark made by Mr. Shadbolt as to the importance of a delicate test for minute traces of hyposulphite of soda, said that it occured to him that, as the salt in question contained sulphur, evidence of its presence might be obtained by adding an acid to the suspected solution, and then adding a few drops of solution of nitro-prusside of sodium, which had the property of producing a beautiful blue colour in solutions containing sulphur. He (Mr. Martin) was not sure that such a result would be obtained in the present instance; but Mr. Williams, who was present, could, he knew, speak with more authority on the subject.

Mr. WILLIAMS replied that it was essential to the success of the reaction named by Mr. Martin that the sulphur present should exist in the state of sulphuret, which was not the case with hyposulphite of soda even after the addition of an acid. He (Mr. Williams) knew a photographic firm who adopted the plan of washing their prints with three changes of water, and finally pressing them between folds of blotting-paper, which last operation had an important influence in removing the final traces of hyposulphite of soda.

The CHAIRMAN remarked that that was an expensive plan, as the paper could not, of course, be used a second time.

Dr. DIAMOND said he had used blotting-paper in that way a second time, and found it mottle the prints. The Count de Montizon had recommended to him the plan of laying the prints on glass, and dabbing them while wet with a piece of cotton wool, which seemed to have the effect of forcing water through the pores of the paper.

The CHAIRMAN was of opinion that the non-permanency of photographs arose, not so much from remaining traces of hyposulphite of soda, as from some peculiar action originating in the toning or fixing baths.

Mr. SHADBOLT did not attribute fading so much to the hyposulphite of soda as to the hyposulphite of silver which it held in solution.

The CHAIRMAN then proposed a vote of thanks to Mr. Shadbolt, which being unanimously accorded the proceedings terminated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary monthly meeting of this Society was held on Wednesday, the 4th instant,—John Parry, Esq., Vice-President, in the chair.

Mr. James H. Lynde and Mr. Robert Atherton were elected members of the Society.

The CHAIRMAN read an extract from the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY relating to a paper *On the Albumen Process* by Mr. Cramb, as practised by him during a tour in the Holy Land, and he (the Chairman) called the attention of the members to the exceedingly short exposure which was said to be sufficient, and which was quite at variance with his experience. If Mr. Cramb had attributed this rapidity of action to an amount of light peculiar to the country in which the pictures were taken he could have understood it, but he did not instance it as at all affecting the result.

Mr. NOTON said that the statement of Mr. Cramb, if it were intended to apply to this country, did not at all agree with his experience; but he felt certain that the temperature and amount of light under which the pictures were taken must have had great influence. He recollected once, when he was staying in a midland county, taking some portraits with wet collodion. On his return home, the next day, he used precisely the same chemicals; and, although he lived out of town, the exposure required was at least twice as long. It was very easy, therefore, to arrive at an explanation, or at any rate in part, of Mr. Cramb's results.

Mr. MANN stated he had frequently observed that the sensitiveness of plates was greatly exalted at the seaside.

Mr. BROTHERS said that he could not believe in many statements which were made in reference to the effect of different atmospheres. He had made it his business to inquire of many whose portraits had been taken in Paris, and he found it to be established that the sittings required there were quite as long as he found necessary in his own gallery.

The CHAIRMAN exhibited negatives and prints of microscopic objects. The substances were fossil coal, containing much bituminous matter. The enlargement was about thirty diameters, and the negatives were taken with wet collodion, which was exposed about thirty minutes. Some objects might be taken in a shorter time; but here there was much colouring matter. In reply to an inquiry, he stated that there was no difficulty in keeping a collodionised plate so long under exposure.

The SECRETARY stated that he thought the principle of printing by development had been unnecessarily abandoned. It was true that good uniform results had not hitherto been obtained; but he had seen pictures by that method which were everything that could be desired, and the thing, therefore, was possible. He suggested that, as this was a process which could be carried on in the winter, the members might most profitably devote their spare time to its investigation; but he wished to warn them from jumping at conclusions, and insisted that nothing short of a most patient and extensive series of experiments would be of the slightest value.

The CHAIRMAN said that he had once witnessed an experiment by which a print was obtained in five seconds: another exposed seven seconds was completely overdone. He could not then obtain the particulars of the process, and the secret had gone with the inventor.

Mr. HOOPER inquired whether the Chairman knew if the surface were iodide of silver, and on being answered in the affirmative stated that he should consider five seconds a long exposure. There was no difficulty in getting rapid results with an iodide, but the effect, so far as he had seen, was bad. The chloride of silver, he thought, was the proper substance to be used.

Mr. TÖBLER exhibited that which should have been a negative, but which was a complete positive by transmitted light. His intention had been to get a negative from an engraving: the light was very deficient, and, after the application of a solution of sulphate of iron, a very weak image appeared. The plate having been washed, he applied a solution of pyrogallic acid of the usual composition: instantly the picture was intensely blackened, and on looking at it by transmitted light he found it to be a positive. He had since trie to repeat the experimeut, but had failed.

Some suggestions that the effect had been produced by over-exposure were proved to be inconsistent, for it was agreed that the time was barely sufficient for a good negative.

A further discussion on this subject followed; but no explanation could be given.

The SECRETARY announced that, as the first Wednesday in January would fall on New Year's Day, the next meeting would be held on January 8th.

A vote of thanks to the Chairman terminated the proceedings.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held at 18, George Street, on the 4th inst., when the chair was occupied by J. D. Marwick, Esq., President.

There was a large attendance. The following gentlemen were admitted by ballot as members of the Society:—Rev. D. T. K. Drummond, Dr. Wilson, and Andrew Drybrough, Esq.

The SECRETARY then read the following report of the Council:—

REPORT.

IN submitting this the first Annual Report, the Council have pleasure in congratulating the Society upon the very great prosperity which has attended it during the short time it has been in existence.

Formed, as the Society has been, for the purpose of diffusing photographic knowledge, the marked appreciation of efforts in this direction proves that the anticipations of its projectors have been more than realised.

During the short period of the Society's existence there has been a steady influx of members. Scarcely a meeting has taken place at which one or more members have not been added to the roll, which now contains the names of seventy members. It is with regret that the Council have to record the death of one of our most energetic members, Dr. Easton, who was called from among us after a very short illness. His assistance and suggestions in conducting the affairs of the Society were valuable, and his loss is lamented.

Since the formation of the Society, twenty meetings have been held, at many of which original papers, several of them possessing great merit, have been read.

These have been published among the transactions of the Society in THE BRITISH JOURNAL OF PHOTOGRAPHY, the official organ of the Society.

The following list comprises the various papers alluded to:—

On the Mode on which the Society should Conduct its Operations. By Mr. Marwick.
On the Fothergill Process. By Mr. Burns.
On the Collodion Process for Beginners. By Mr. Nicol.
On the Photographic Uses of Gold. By Mr. Davies.
On the Magic Lantern. By Mr. Taylor.
On the Waxed Paper Process. By Mr. Traill.
Photographic Trip to the Orkney Islands. By Mr. Traill.
On the Hot Water Process. By Mr. Slight.
On Photographic Composition. By Mr. Davies.
On Positive Printing. By Mr. Musgrave.
On Photographic Distortion. By Mr. Bow.

To these gentlemen, as also to Mr. Ramage and Mr. Lennie (for their dissolving view entertainments), and to Mr. Moule (for the readiness with which he acceded to their desire of procuring a trial of his patent photogen) the Council would tender their cordial thanks.

An interesting feature in the Society's proceedings has been the organisation of popular meetings, to which the members have had an opportunity of inviting their friends, the entertainments on such occasions having been specially selected for a mixed audience. The great success which has attended these meetings, and the interest which they have excited, warrant the Council in recommending the repetition of these at stated periods.

Another feature in connexion with the Society is the arranging of occasional Saturday photographic excursions during the summer, for the purpose of friendly trials of skill; and from the evident pleasure the members have derived from these during the past summer, the Council feel satisfied that much good will result from a continuation of them during next season.

Instead of meeting twice a month throughout the year, as hitherto, the Council recommend that during the months of June, July, August, and September, the Society should meet only once a month, and this mainly for the purpose of arranging excursions. They also recommend that, from the standing and importance of the Society, an addition be made to the office-bearers, and that in future they consist of a President, two Vice-Presidents, two Secretaries, Treasurer, and twelve Members of Council.

This report was unanimously adopted.

The following office-bearers were elected for the ensuing year:—
President—J. D. Marwick.
Vice-Presidents—George H. Slight and Robert H. Bow, C.E.
Treasurer—Alex. T. Niven, C.A.
Auditor—F. H. Carter, C.A.
Joint-Secretaries—John. T. Taylor and Alex. Auchie, jun.
Members of Council—Adam Mossman, James Ramage, Andrew Mure, Alexander Auchie, W. H. Davies, William Lyon, John Nicol, Richard G. Muir, David Cousin, Æneas Walker, James Falshaw, R. Patterson.

On the motion of Mr. AUCHIE,

A vote of thanks was awarded to the office-bearers for their past services; after which arrangements were made for teaching classes in the various processes of photography practised at the present day.

Mr SLIGHT then read a paper *On the Art of Seeing Binocular Pictures Without the Aid of a Stereoscope.* [See page 437.] This was illustrated by diagrams and stereoscopic pictures.

A conversation on the subject ensued, in which Mr. Bow, Mr. Fleming (Leith), Mr. Walker, Mr. Nicol, Mr. Taylor, and others joined.

The thanks of the Society were awarded to Mr Slight; after which the meeting separated.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this society was held in 51, George-street, on the 10th instant, when the chair was occupied by William Walker, Esq., and subsequently by Sheriff Moir.

A communication was made by Mr. Alexander J. Macfarlane *On the Application of Photography to the Delineation of Disease, with Remarks on Microscopic Photography*, in which he showed how photography could be made useful in connexion with the various branches of the medical curriculum. He also explained the means he had adopted to obtain stereoscopic photographs of microscopic objects. He illustrated his remarks by several pictures of ferns printed from direct contact, stereographs of anatomical and pathological preparations, and ordinary and stereoscopic photographs of microscopic specimens.

The thanks of the Society were awarded to Mr. Macfarlane for his communication.

In further illustration of the advantages to be derived from photography in surgical cases, the Chairman exhibited a stereograph of some particular disease in connexion with the eye, on which he had performed an operation, and when the cure was completed he hoped to show them another photograph, which would then be taken.

Mr. Nicol then read a paper *On the Manufacture of Pyroxyline.* [See page 438.]

The CHAIRMAN said that although he was not chemist enough himself to appreciate fully all Mr. Nicol's remarks, yet on one thing they would all agree with him, viz., that they were much indebted to that gentleman for his kindness in coming forward to their assistance at such very short notice as he had had; and he had no doubt but that many of those present who had heard how thoroughly Mr. Nicol was acquainted with the subject of the manufacture of collodion, would gladly apply to him when they required that article, feeling satisfied they would get as good as could be obtained.

Mr. ORANGE then exhibited a portable tent, which, by having an arrangement for holding a number of bottles, &c., packed inside, was said to possess some advantages over others. It seemed, however, to be inconveniently bulky for the amateur peripatetic photographer.

The thanks of the Society were tendered to Mr. Orange; after which the meeting separated.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

THE annual meeting of this Society was held on Friday, the 29th ult., at the Odd Fellows Hall, Temple Street,—Mr. C. L. Haines, V. P., in the chair.

The circular convening the meeting having been read, and the minutes of the previous meeting read and approved,

A ballot was taken for John Anthony, Esq., M.D., who was declared to be duly elected an ordinary member of the Society.

In compliance with a resolution of Council, the names of Messrs. J. Lancaster (optician, Colmore Row), J. Oxford, and Brittain, were submitted for removal from the roll of the Society, and on a ballot being taken they were struck off accordingly.

The HON. SECRETARY moved the following alterations in the rules, of which he had given notice:—

"That the number of members of Council be reduced from *eight* to *four*."

"That the meetings of the Society be held on the *second* instead of the *last* Tuesday in each month." And

"That the hour of meeting be altered from *eight* o'clock to *half-past six*."

Mr. HAINES seconded the motion, which was carried unanimously.

The HON. SECRETARY read the report of the Council for the past session as follows:—

REPORT.

YOUR Council, in presenting this their fifth annual report, have to congratulate the Society on the continued success which has attended the efforts they have made to render the meetings not only interesting but instructive.

During the past session several most important papers have been read, comprising—

Failures in the Dry Collodion Process attributable to the Glass. By Hill Norris, Esq., M.D.

The Camera of Horrors; or, Difficulties and Failures in the Wet Collodion Process. By O. G. Rejlander. Esq.

The Relative Capabilities of the several Descriptions of Lenses to the various Kinds of Work to which they may be Applied. By John Anthony, Esq., M.D.

W. B. Osborne, Esq., V. P., occupied one evening in making remarks upon a paper read before the London Photographic Society, on *Stains in the Negative.*—On each subject an interesting discussion took place.

Your Hon. Secretary, Mr. John Thomas Brown, Jun., also read a paper on *Art-Photography*, and illustrated his remarks by various artistic productions.

To each of these gentlemen your Council feel that they are deeply indebted, and beg to offer their united thanks.

One evening was partially devoted to the examination of a portfolio of the works of Mr. Rejlander, *Studies from Life*, which that gentleman kindly laid upon the table, and to whom, with others who have also forwarded prints and apparatus for exhibition, your Council beg to tender their sincere thanks.

Your Council have much pleasure in announcing that the Exhibition at Aston Hall has fully answered every expectation, except in so far as relates to the sale of catalogues; and, at the same time, feel that the best thanks of the Society are due to the gentlemen forming the sub-committee for the energy they have displayed throughout the matter.

In conclusion, your Council would impress upon each member of the Society the necessity for more combined action, so as to maintain it in the present important position it occupies; and trust that the apathy and indifference which your Council had to warn the Society against last session may be displaced by a more energetic attention to the interest of the art on the part of each individual member, and by a large and increasing attendance at the meetings—a result which they anticipate will arise from an alteration in the hour of meeting.

On the motion of Mr. HAINES, seconded by Mr. REJLANDER, the report was received and adopted.

A ballot having been taken for the election of officers for the forthcoming session, the following gentlemen were declared to be unanimously elected:—

President—John Anthony, Esq., M.D. *Vice-Presidents*—Mr. C. L. Haines and Mr. H. P. Robinson. *Treasurer and Hon-Secretary, pro tem*—Mr. John Thomas Brown, jun.. *Council*—Mr. O. G. Rejlander, Mr. John Turner, Mr. Hart, and Mr. Jones.

Mr. BROWN proposed a vote of thanks to the President, Vice-Presidents, and members of Council for the past session, and he did this with the greater pleasure as he was fully aware of the difficulties they had to contend with; for although they entered upon their duties with a balance in hand, still the prospects of the Society were somewhat unfavourable, and it was only by great exertion that they had succeeded in establishing its position. On glancing over the list of members, he believed that no other photographic society in the kingdom could boast such an array of men, each of whom stood pre-eminent in the peculiar branch of the art he practised, and he (Mr. Brown) therefore felt that no energy should be spared on the part of the members in maintaining for the Society so proud a position. He thought this a fitting opportunity to call the attention of the members to the concession made by the Royal Commissioners for the Exhibition of next year, and hoped that they would so far accept it as to forward specimens of their productions.

Mr. TURNER seconded the proposition, which was carried unanimously.

Mr. HAINES, in the absence of the President, responded, thanking the meeting for the acknowledgment, and reminding the members that as they entered upon the present session with more encouraging prospects than the last, much more would be required on the part of each, and trusted that at the conclusion of this session they would have placed the Society in a still more important position than it then occupied.

Mr. REJLANDER said that he was one of those who had accepted space to exhibit next year in the Great Exhibition. He had been very much surprised to see the new-born zeal which, in the late discussion with the Royal Commissioners, the Parent Society had shown in favour of art-photography—a department to which, as he knew from his own experience, they had never before shown the slightest encouragement. It was only when the present Exhibition had been projected that they came forward and proudly asked for a place among the fine arts. Now, he knew something about the fine arts, and something about photography, but he would not ask that photography should have a place among the fine arts or any arts. It was a thing of itself, combining both art and science, but not to be compared with any other art or science. He was quite satisfied, therefore, that photographs should be exhibited—not among the fine arts, but by themselves.

Mr. HAINES then proposed a vote of thanks to the Hon. Secretary and Treasurer, which was seconded by Mr. TURNER, supported by Mr. REJLANDER, and briefly responded to by Mr. BROWN.

Mr. REJLANDER said he had to call the attention of the Society to a serious difficulty he had recently met with, and which, as it completely destroyed the negative for all practical purposes, he thought was of sufficient importance to occupy their attention for a short time. He alluded to a decomposition or breaking-up of the collodion film under the varnish, and in explanation laid before the meeting a photograph which he had copied from a painting by Murillo. On inspection it would be found that in the centre, and indeed almost all over the picture, were a number of fine, hair-like, serpentine cracks. These were not in the varnish but in the collodion film beneath it. He had made inquiries as to the cause, and had been informed that it was his own fault for having varnished the

pictures before they were perfectly dry, or for not having washed the cyanide off clean. This might be so; but it was very curious that there were no cracks in the photographs he had taken five or six years ago, when he was more careless than he was now. But, as a test, he had a few days ago, taken two negatives, and having washed off just enough of the cyanide to see that the plates were not greasy, had partially dried and varnished them, and he should wait the result.

The Hon. Secretary suggested that the cracks might be caused by the hygrometric properties of the glass, or from the difference in the contractile qualities of the collodion and the varnish, but thought they were referable to the former cause.

Mr. Turner expressed a decided opinion that it was caused by the collodion used being old, or otherwise in an unfit state. It was well known that a better picture could be taken by a mixture of old with new collodion in certain proportions than with new collodion alone; but, when the collodion used was too old, he had sometimes seen the picture eaten completely off the plate with the varnish. He knew that most of the makers of collodion would send it to different men in the district for sale; and the large shopkeepers who had a stock of collodion long on hand were allowed to send it back and get new in its place. Of course as soon as the manufacturer got this old collodion he would mix it with the new: they might be sure that he would not throw it away. But, though this mixture might improve the new collodion for a time, it was a question whether it would keep. In his opinion the only way to be safe at the present day was for photographers to make their own collodion, otherwise they might be disappointed by finding that, after a time, valuable pictures would either disappear from the plate or, as in the case before them, be spoiled by the cracking of the collodion.

The Hon. Secretary said that he was still of opinion, from the appearance of the picture, that the cracks were caused by the porous nature of the glass on which the negative was taken.

Mr. Rejlander said he thought that could not be the case, as the glass was the best plate-glass. He was of opinion that the injuries were caused by some defect in the collodion, and he was now carrying on some experiments that would show where the fault really lay.

The meeting then adjourned.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

This Society held its usual monthly meeting on Thursday, the 5th ult., in the Religious Institution Rooms,—Mr. J. Jex Long in the chair.

The greater part of the evening was taken up with private business, considering some alterations in the constitution of the Society recommended by the Council. Among other alterations it was arranged to change the period for holding the annual meeting from March to January.

Office-bearers for the ensuing year were then nominated.

Mr. John Cramb intimated that he had decided upon retiring from all active management in the Society. This resolution would not deprive the Society of his services for any use he could be to it, but he believed a successor could now be found. The members would all remember how unwillingly he accepted the Secretaryship. He believed his retirement at this time would not be injurious to the prosperity of the Society; but, if it should prove otherwise, his services, as far as his other engagements would permit, were at the disposal of the Society.

The Secretary then exhibited some very fine specimens of photo-lithography done by Mr. Gibbons, of Glasgow.

Mr. J. Cramb exhibited an extremely simple form of printing-frame, for the ten by eight size; similar frames to these exhibited could be had for twelve shillings a dozen. That he believed was the cheapest frame ever described.

Two papers which were set down to be read by Mr. Cramb were postponed, owing to want of time.

NEWCASTLE-ON-TYNE AND NORTH OF ENGLAND PHOTOGRAPHIC SOCIETY.

The above Society held a meeting in the Weaver's Tower, New Bridge Street, on Friday evening, the 6th instant. Mr. G. C. Warren occupied the chair, and briefly introduced Dr. Lockhart, who read an interesting paper, by Mr. Sutton, *On Panoramic Photography*. A new patent panoramic apparatus, and some beautiful views taken by the apparatus, were exhibited to illustrate the paper.

[The substance of the paper having several times already appeared in our pages, and one on the same subject by Mr. Ross being contained in the present number, it is useless to repeat it again.]

It was unanimously resolved that the kindness of Mr. Sutton in so readily consenting to furnish the Society with a paper, in selecting for it a subject so peculiar and so interesting as his own panoramic lens, and in so clearly and satisfactorily expounding that subject in the excellent paper read, well entitled him to the best thanks of the Society; and that the Secretary communicate to him a copy of the resolution. It was also resolved unanimously that the best thanks of the Society be given to Mr. T. Ross for his kindness in allowing them an inspection of his panoramic apparatus for the purpose of illustrating Mr. Sutton's paper on his panoramic lens. Some general conversation followed, and the meeting terminated.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

Members are reminded that the next meeting will take place on Wednesday next, the 18th instant, when a paper by Mr. Bourne, descriptive of his mode of working the Fothergill process, will be read.

BRADFORD PHOTOGRAPHIC SOCIETY.

At a recent meeting of this Society a resolution was adopted, postponing the contemplated Exhibition, proposed to be held this year, until November or December, 1862. We are requested also to state that in future the proceedings at the Society's meetings will only be reported when, in the judgment of the Council, matters of sufficient importance to justify publication are brought before the meetings.

Foreign Correspondence.

Paris, December 11, 1861.

A few days since the attention of the crowds that frequent our boulevards was attracted by the words "*Exposition Disdéri*" figuring in gigantic golden letters on the balcony of the rooms at the corner of the Rue Drouot, which were but lately occupied by the Jockey Club. In all parts of Paris large posters announced the opening of this Exhibition, the proceeds of which, arising from a charge of fifty *centimes* for entrance, are generously destined for the poor. Unwilling to be among the tardiest to respond to the invitation, I immediately repaired to this extemporised museum. I must confess that I came away wonder-struck, both at the number and the merit of the works which are therein collected.

The walls of two very spacious rooms are entirely covered with portraits of every dimension, from the simple visiting-card and medallion to the full-length portrait of natural size. Several consoles, covered with velvet, exhibit photographic enamels, albums, and caskets. The ante-chamber has been converted into a sale-room. There are several attendants for the reception and guidance of the visitors; and, lastly, a special catalogue is sold at the door. You see Disdéri does things liberally. Hosts of crowned heads, warriors, writers, artists, medical men, and lawyers are to be found there, with distinguished persons of every kind, and the representatives of every class of society. So much for the subjects. As for the execution that must be acknowledged as very remarkable. The portraits amplified by M. Wothly's method do great credit to that process. That which characterises the pictures in general is the care bestowed upon their printing, whereby, it must be avowed, they are placed in contrast with the large part of the productions of our portraitists. It is true that when from twelve to fifteen hundred pictures per day have to be delivered to the public, and the labour has consequently to be entrusted to subordinate workmen and operators, as much care cannot be given to the printing as when the operation is performed at leisure. Such admission, however, being made, the fact still remains that in this important matter our portraitists are often not sufficiently careful. I have had frequent opportunities of examining portraits of English or German origin, and have been struck by the superiority they show in this point over our own productions.

While Disdéri is inviting the public to his Exhibition, his brethren are not idle. All are busily occupied in preparing for the great battle of New Year's Day. Here and there there are springing up new establishments, and yet the old ones are as crowded as ever. There is also some talk of the formation of a company which is to organise a sort of special bazaar, comprising an operating-room for portraits, a photographic printing-office, a depôt for all the apparatus and chemicals employed in photography—in a word, everything connected with the art.

Delton—who is continuing alone the establishment which he had founded in conjunction with Nadar in the Avenue de l'Impératrice—has been entrusted with a singular commission. He is executing for the *Entreprise des Pompes Funebres* (Metropolitan Burial Company) all the objects which that Company hire out for funerals. Death, as well as life, has its pomp and its humility. There are eight or ten different classes of funerals, tariffied and specified as merchantable articles are. In future, when a friend or a relative shall present himself at the *Mairie* to make the declaration of a death, the *employée* of the Company who is attached to the *Mairie* will place before him a voluminous album, representing piece by piece all the items belonging to any particular class, and indicating their prices. Thus the person in question will be able to make his choice, and to reckon up the amount himself. Is it not an ingenious idea? Such is the labour that Delton has courageously undertaken—a labour which constitutes the saddest but not the least lucrative application of photography.

Another photographer has received a mission of a different kind: he has to reproduce all the stallions belonging to the Imperial studs. The collection thus formed will be magnificent, and at once interesting to the painter and to the amateur of the turf.

It is said that the Minister of the Interior is preparing a regulation obliging every photographer to take out a publisher's license, for which a somewhat high price will be demanded. This measure is said to be principally directed against the production and circulation of obscene pictures, for which photographic processes have been largely used. The withdrawal of the license, besides judicial condemnation and confiscation of goods, would be held threatingly over the heads of those who might be tempted to lend themselves to this ignoble commerce. For some time past the condemnations for offences of this kind have increased to a degree that is deplorable, as betokening a deep-grained demoralisation. It is humiliating to see so beautiful an art debased to such shameful uses.

The first meeting of the Photographic Society of Marseilles took place on the 30th of November. M. Léon Vidal, the Secretary, inaugurated the meeting by reading a report of the Exhibition—a report which is in fact a very well-written article on the present state of photography in France. Then came various interesting communications, among which a note from M. Oppenheim, of Dresden, on the printing process employed by him. M. Oppenheim prepares whey by treating warmed milk with tartaric acid, and clarifying with albumen. He makes the liquid boil, filters, and when it has become cold adds to it five per cent. of iodide of potassium, and again filters. This whey is mixed with albumen in equal quantities. The sheets are placed upon this mixture for half-a-minute, and then dried. The paper is sensitised by being placed on a five per cent. nitrate of silver bath, *without any acetic acid*. After remaining a minute upon this solution the paper is *placed upon the surface* of distilled water, where it remains for the same time. It is then plunged into a copious bath of distilled water. The first water must be changed after the preparation of three or four sheets. A few seconds' exposure suffices, even in a diffused light. The image should be scarcely visible on leaving the copying press. It is developed with gallic acid, to which have been added crystallisable acetic acid and a little nitrate of silver. Heat may be employed to accelerate. It is fixed in a 20 per cent. hyposulphite bath. The picture is fixed when the yellow tone has disappeared. In case the tone is reddish, it may be concluded that the exposure was too long, or that the bath did not contain enough nitrate. The picture may be toned with chloride of gold. I must add that M. Oppenheim's pictures speak well for the process.

ERNEST LACAN.

New York, November 15th, 1861.

Dr. HAYS, who sailed for Arctic exploration from Boston, July 10th, 1860, has just returned from his tolerably successful expedition. The Doctor had the enterprise to study photography before he left, and went equipped with the paraphernalia of the art. He brought home upwards of two hundred stereo. negatives, illustrating the most important objects about which there is a curiosity among the people. The prints from the negatives, no doubt, will shortly reach all parts of the globe. This photographic verification is a very appropriate climax and wind-up of voyages towards the north pole: there is no need of anything further.

I have observed that Mr. Shadbolt and others in England appear not to agree with me regarding the pictures made by Harrison's new lens, and forwarded with these letters. The disagreement in some respects is only a misunderstanding, which, probably, would not have arisen if my explanation of the action of the lens had been accepted. It has merely been claimed that the lens would only make an angular field of view of 90°, *the field of view being a circle*. No one who will give the construction of the lens a little careful examination will fail to observe that such a lens will admit light from all the objects within the field of 90°, and after that theory and practice have shown that the focus of objects may be brought on a plane surface. I ask, therefore, that a final judgment of condemnation be not yet pronounced.

Our Photographical Society had a very pleasant meeting on the 11th ult. A spectroscope, after the model of that used by Bunsen and Kirchhoff, and just received from Germany, was exhibited by Professor Joy: also the discoveries made by the spectroscope were quite fully illustrated by drawings. Dr. Draper, the President, remarked that in the instrument and charts he recognised familiar acquaintances: fifteen or sixteen years ago he was using such an instrument in the University, and published similar charts.

In practical photography we had a great deal of praise of the dry processes, and an exhibition of a box for dry plates. The box is so contrived that the plate may be transferred from and to the shield in the open light. The box is described and engraved in the *American Journal* of November 15.

We were also much interested in examining photographic apparatus and pictures which were in fashion in 1842-3. The most curious of these are daguerreotypes in the hollow of a hemispherical plate, for use in the magic lantern. The lens by which these pictures were made is a plano-convex of short focus. The inventors (Wolcott and Johnson) were well aware of the desirableness of a glass surface for lantern pictures, and in 1843 made successful experiments with albumen on glass as a substitute for paper in Talbot's process. The experiments were interrupted by sickness, and their labours were private, so that they never enjoyed the fame which was their due. CHARLES A. SEELY.

New Books.

Mauual of Photographic Colouring. By A. H. WALL.

London: THOMAS PIPER, 32, Paternoster Row.

To most of our readers the name of Mr. Wall will be a sufficient guarantee that the contents of this work are well worth their attention. Portions of the substance of the lessons contained in it have already appeared in these pages, and those who have perused them will be well acquainted with the very practical nature of the instructions given.

The passages to which we make allusion have been re-written and considerably extended, and a large mass of new matter has also been added. Mr. Wall has availed himself of the opportunity of adding such hints as have been suggested by his correspondence with pupils during the periodical appearance of his lessons. Of the author's style our readers have had frequent opportunities of judging, and are, therefore, sufficiently familiar with it; but, had we space to spare, we should certainly have given an extract from his chapter on colouring landscapes, which, we have no doubt, would have been peculiarly interesting to many enthusiastic amateurs, some of whom will probably act upon the hints therein contained, and reap new delight from their negatives during the winter months, when they cannot be at work in the field. To the professional student the work will be found equally valuable, and we cordially commend it to all desirous of entering upon photographic colouring of any kind. Before concluding, it may not be inappropriate to remark that the author has not laid aside the pencil for the pen, as any one may ascertain for himself by looking in upon our photographer and colourist at 35, Westbourne Grove, Bayswater, where knowing brethren of the camera go ostensibly to have *carte de visite* portraits taken, but really to pick up some information about colouring, well knowing that they have but to ask to be informed.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

STEREOSCOPIC CAMEBAS, &c.

To the EDITOR.

SIR,—Will you have the kindness to answer me the following questions in your next impression, if not too late:—

1. In having a stereo. camera made is it advisable to have it made to take glasses half an inch longer and a quarter of an inch wider than the ordinary stereo. size? I think of using two pairs of lenses, four and a-half inches and six inches focal length: what will be the best-constructed camera I can have for the purpose?

2. I have a ten by eight-inch print: having lost the negative, can I obtain from the print an equally good negative the same size? I also should like to know how to take a negative stereo. size, and if the relief will be right from the same print?

3. I also wish to know the best preservative process that will last from three to four hours? And—

4. Whose dark tent do you recommend as the best for travelling purposes?

The favour of answers to the above will greatly oblige, yours, &c.,

W. Y.

[1. It is always as well to have a little extra margin upon your plates, in order to avoid curtailing your sizes by flaws at the edges. You will, however, find plates seven inches or seven and a-half inches square

admirably adapted for taking two pairs of stereographs at the same or different times, and effect a considerable saving of trouble in preparation.

2. You cannot take a negative from your print that will be *equal* to the original, more especially if you desire to have it of the same size. You cannot take a pair of stereographs from one print.

3. We know no process superior to the honey process if you desire to keep the plates sensitive for only a few hours.

4. If you will refer to our back numbers you will find illustrations and descriptions of many excellent dark tents, and you will be able to judge which is the most likely to suit your purpose. Look especially at Smartt's and Rouch's, as types of two different classes: most others are analogous to one or other of these.—Ed.]

MR. J. CRAMB'S CAMERAS.

To the Editor.

Sir,—I wrote a letter to you on the 26th August, regarding a reference made by Mr. Sidebotham to the cameras described by me in The British Journal of Photography, page 265. I am sorry to observe that Mr. Sidebotham, at a late meeting of the Manchester Photographic Society, repeats his former statement, utterly ignoring my letter. I cannot believe that he has seen my explanation. Permit me, Sir, to call Mr. Sidebotham's attention to my former communication, convinced, as I am, that he will see the injustice of the charges he has so persistently repeated.

I am, yours, &c., JOHN CRAMB.

67, *West Nile Street, Glasgow, Dec. 9th*, 1861.

AVOIDANCE OF THE USE OF HIGHLY ALBUMENISED PAPER.

To the Editor.

Sir,—My present letter arises from a remark you made, a few months ago, when commenting on a paper of Mr. Lyndon Smith's against the use of the highly-albumenised paper now so much in vogue. You said (I quote from memory) that, while agreeing with Mr. Smith that its use was an evil, you thought it was a necessary one, since it was impossible to get detail in the half-tones and transparency in the shadows without it. What Mr. Smith's objections to albumenised paper were, I do not know; mine are—expense and, *especially, toning difficulties*. When, on taking to the alkaline toning process, I had repeatedly to throw away whole batches of prints on account of mealiness and uneven toning, I foreswore the use of the highly-albumenised paper, and determined to use such as had only just enough albumen to keep the picture on the surface, trusting to other means for bringing out the detail and imparting transparency. After trying varnishing and French polishing, which answered the purpose to a certain extent, but took too much time, I tried a method which I remembered to have been suggested years ago, long before highly-albumenised paper was thought of, viz., rubbing over the print with a mixture of wax and spirits of turpentine, and it gave such satisfactory results I have kept to it ever since. That you may see how well it answers I send two pictures treated in the way described. I first smooth the grain of the paper by pressure or rubbing with some hard smooth surface, and then apply the wax and turpentine: two or three rubs with a rag gives a fine polish and removes the stickiness. I cannot give the exact proportions of the two ingredients, as they vary with different kinds of paper: my rule is to use as much turpentine with the wax as I can without its causing greasy marks on the paper, as I wish the mixture to penetrate the surface of the paper so as to give transparency, but not to pass entirely through.

It strikes me, too, that prints treated in this way will have their permanency greatly, if not indefinitely, increased, as the wax on the surface and held in the pores of the paper will prevent moisture and air acting on the picture and setting up chemical changes in its constituents.

I hope no one will denounce me as laying claim to novelty. The suggestion dates back to the very infancy of photography on paper; but as amongst my rather numerous photographic acquaintance I have never met with one who used the mixture, and the complaints about toning difficulties are so frequent, I thought it would not be out of place to call the attention of your readers to what would enable them to use paper which tones rapidly and evenly without sacrificing detail and transparency.

I am, yours, &c.,

A COUNTRY PARSON.

P.S.—The views I send were taken by the hot water process.

[The specimens received in illustration are highly satisfactory in every respect—the manipulation perfect, the lights clean and bright, the shadows clear and transparent, and the effect very good.

The waxing was suggested originally by a French photographer, and, as our correspondent observes, some years ago; but we believe it was not thought prudent to adopt the use of wax in this way when *but few* prints were toned with gold. We think the gold toning removes the chief objection to the after-application of the wax.—Ed.]

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

ANSWERS TO CORRESPONDENTS.

☞ Several papers in type are unavoidably postponed for want of room.

H. R. Nichols.—In our next.

C. B. J.—He has entirely given up the art.

O. R. B.—Received with thanks. We will forward the information, as requested.

J. A. M.—If the chloride of gold shows an acid re-action to test-paper, it should be neutralised with the carbonate of soda before adding the acetate to your bath.

Monmouth Operator.—Mr. Bedford, Mr. Ogle, and Mr. Woodward have all of them visited the spot you indicate, and brought away some excellent illustrations.

J. Burdon.—Had your communication been addressed direct to the Editor, instead of to the Publisher—agreeably with the printed notice always placed at foot of this column—the replies would have appeared in the current number. They will be given in our next.

Enquirer.—The *principal* focus of a lens is that produced by parallel rays, or those proceeding from a very distant object, *e.g.*, the sun. *Conjugate foci* are those of any object and its image, both of which are at a greater distance from the lens than the *principal* focus under ordinary circumstances; though, of course, if the sun be the object, its conjugate will be equal to the principal focus.

W. Daniels.—The lenses named you will find exactly such as we should recommend. It is not *necessary* to have the glasses larger than ordinary, but convenient to do so; if, however, you have two pairs of lenses we advise you to have them mounted on one camera for plates 7 inches or 7½ inches square, as it saves much trouble in preparation of the plates, and they can be cut in two, if desired, after exposure and development.

J. H. S. (Birmingham).—We are not quite sure what you intend to indicate by the words "grey solarisation." Solarisation generally means the destructive action exercised by over-exposure of the high lights, so that the deposit of silver will not form on the parts of the plate so affected, leaving it nearly transparent. If you mean "grey *flatness*" from the bath being over acid, or from its containing an abundance of organic matter, the remedy you propose and exposure to light subsequently will most probably cure the complaint.

K. S.—We do not imagine the annoyance to arise from the presence of iron in the water, but probably from sulphuretted hydrogen. To test for iron, add to the suspected water gallic acid or prussiate of potash: the former will strike a blackish the latter a bluish colour if it be present. For sulphuretted hydrogen try it with acetate of lead, which would cause a dark-coloured brownish precipitate or cloudiness. You cannot remove either of these impurities by filtration; and, if present, you had better use rain water for your first washing.

C. Bell.—We do not perceive any mystery in the fact that the photographs mounted with arrowroot are more difficult to remove from the mounts than when gelatine is employed; nor did we understand Mr. Simpson to have expressed astonishment thereat. Arrowroot is a species of starch, and most of the paper used for albumenising is foreign paper which is generally sized with starch; therefore the probability is that, from the homogeneity of the sizing and adhesive materials employed, the whole fabric of the paper is, as it were, held fast to the mount. Hot water will loosen the picture very quickly. We introduced the use of gum-tragacanth for mounting more than six years ago. See *Journal of the Photographic Society*.

J. L. P.—Pray don't call them stereo*grams*: it is a horrid word. Surely stereo*graphs* is more euphonious and more in accordance with similar words in the language.

Our province is not to flatter, but to tell truth even if it be not over palatable; but in the present instance we can honestly award commendation. Your improvement is very marked. We must draw your attention to one or two points of difference in the requirements for stereographs and large photographs, in order that you may not mistake our comments. The former should be soft harmonious pictures, and it is not of much moment if they are somewhat "flat"-looking when out of the stereoscope, provided the subject delineated be really located in different planes, because in *the stereoscope* these varying planes will be sufficiently defined; but it is of importance that your proof should not be "hard" or over-developed, for, if so, an unpleasant "snowiness" of effect is produced in the stereoscope. Now, with single pictures, the reverse of the preceding proposition, to some extent, obtains a picture that is too soft, lacks brilliancy, and appears tame and "flat."

Of the proofs received *Gannachy Bridge* is excellent as a stereograph—that is to say, is very well executed, apart from the subject, which is also good; but, as a single picture, the effect is dull and heavy. *The Mill at Aberfeldy*, on the contrary, is capital as a single picture, though even a shade under-exposed (witness the solidity of the falling water); but, viewed in the stereoscope, the "hardness" of effect is increased. Do not, however, mistake our comment: both pictures are very good, and far above the average in quality. You may certainly regard yourself as having arrived at "the highest form," though not yet at the highest place in your class. Your "instantaneous" sea view is very promising, but not quite sharp enough. Your exposure was not rapid enough. You have scarcely taken enough of your several subjects laterally: another half-inch in width would be a great improvement. And, lastly, we advise your abandoning the practice of cutting the proofs dome-shaped; for stereographs that form detracts from the effect in viewing the pictures in the instrument, though it perhaps makes them look smarter out of it. We should much like information about your dry-plate work for instantaneous pictures. If we correctly understand your remarks you have certainly made a step in advance. We do not think that better results are to be obtained by the process you name than by the one you now pursue, but as good certainly: it is simply a question of convenience to the operator which to employ. You have done so well that we should be disinclined to advise any change, unless you experience some special inconvenience.

NOTICE TO AGENTS.

Orders for Additional Quantities of the Number of this Journal for January 1st (with which THE BRITISH JOURNAL PHOTOGRAPHIC ALMANAC will be PRESENTED) should reach the Publisher not later than the 28th December instant.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

EDITED BY GEORGE SHADBOLT.

VOL. IX.

LIVERPOOL:
HENRY GREENWOOD, 32, CASTLE STREET.
LONDON:
E. MARLBOROUGH & CO., 4, AVE MARIA LANE; HORNE & THORNTHWAITE, 123, NEWGATE STREET.
EDINBURGH: JAMES WOOD, 130, GEORGE STREET.
DUBLIN: McGLASHAN & GILL, 50, UPPER SACKVILLE STREET.
PARIS: GEORGE FOWLER, 6, RUE MONTPENSIER. NEW YORK: E. ANTHONY, 501, BROADWAY.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 157, Vol. IX.—JANUARY 1, 1862.

In Memoriam.

We have had in a few instances—and we are thankful that they have been but few—to record the departure from amongst the dwellers upon earth of some whose names have been unusually deserving of honour amongst the photographic community. Sad as such a task must always of necessity be, we would not forego its performance; for, apart from many other considerations, when one who has been accustomed to mingle actively amongst us, taking part in controversial matters, has faded from before our eyes, the little asperities which used to ruffle the temper have become effaced, and the good points alone live in our memory. But, if the task be melancholy, when there is anything connected therewith that we would willingly forget, how much more so is it when *all* the remembrances are cherished ones, and such as we would desire to record in enduring characters!

One of the most active labourers for the advancement of our art in public estimation—himself a skilful operator, a clever critic, and kind patron—has gone from his wonted place, which shall know him no more. Of course we allude to the beloved Consort of our Most Gracious Sovereign, who was in very truth a photographer of the highest rank, in a double sense. If as loyal subjects we mourn his loss, as photographers we have an additional weight of sorrow to bear, for as a brother as well as a Prince he claims our fond regret.

If our first greeting on the commencement of a new year cannot be a joyful one, our first subject will, we are well convinced, have an intense though mournful interest for every one of our readers, although we have not been able to communicate anything that they will not have already learned; however, perhaps but few of them may have enjoyed the opportunities that have fallen to our lot of being able to verify, from personal observation, the enthusiastic interest which the deceased Prince always manifested in the photographic art—an interest, be it remembered, that was not that of a mere wondering novice, but of the skilled adept, as well as of the art-connoisseur. Long may his memory be cherished amongst us!

The Past Year.—In taking our usual retrospective glance at the achievements of the year just past, the first fact that strikes us prominently is the certainly superior excellence that has characterised the productions of our best photographers when regarded from an artistic point of view. Those who had formerly striven after eminence in this direction have not slackened their efforts, but have deservedly won fresh laurels in consequence of the still further elevation in grade of the works of their heads and hands; while many who had attained to considerable manipulative skill without much art-culture have become aware of their former deficiency, and, by careful study and painstaking attention, have passed somewhat beyond the threshold of the temple of the muses. This is, in our opinion, a highly satisfactory state of things, and is the first step towards winning for photography its recognition as one of the fine arts. If anything were wanting in evidence of the more general attention that has of late been paid to the art-phase, it would be found in the interest with which the valuable papers on this branch of study which from time to time have appeared in our columns have been received.

The next noticeable feature is the more frequent introduction of figures and natural clouds into our landscapes than has heretofore been prevalent; and this again is probably owing to the increased sensitiveness to which our collodion films have been brought, chiefly by the work of a few of our chemically-skilled brethren. Indeed, much attention has been directed to the chemistry of photography, and the results of the labours of the past year in this direction have been felt rather than seen, the principal gain having arisen from greater attention to the purity of the various materials employed and their more careful adjustment to one another; and by attention to this point a considerable simplification of formulæ has resulted. The superior excellence of the "instantaneous" subjects over those of former years has doubtless arisen from the same cause, an equal or even greater effect being now attainable with shorter exposure than formerly; and that is certainly not owing to any greater rapidity in the action of our lenses, the tendency having been rather to strive after their more correct delineation of objects than their condensation of a larger pencil of rays of light. This advantage of greater exactness in delineation is therefore indirectly attributable to some extent to the increased sensitiveness of our chemical media. That "instantaneous" pictures have been produced more perfectly during the past year few persons who have had fair opportunities of examining them will be inclined to dispute: not only has there been an increased definition of details, but that sombre hue which of old was peculiar to pseudo-instantaneous productions has almost, and in many cases, entirely disappeared.

In our optical appliances there has been no striking novelty to record; but, while the principles upon which our lenses have been constructed have suffered no revolution, we may justly claim increased care in their manufacture as having been attended to, and a more general attention given to minor points of detail in construction.

Some further attention has been devoted to the nature of the photographic image, and an attempt was made by Mr. Malone to introduce a theory differing from that held by the majority of our ablest authorities: in this, however, nothing definite has yet been achieved.

We have had no lack of new modifications of dry processes, and if the ardently-expected universal favourite has not yet made its *debût*, many valuable facts have been ascertained, and probably a foundation laid for the ultimate attainment of that

desideratum, an "instantaneous" simple dry process. Amongst the more important of the suggestions in this direction we may cite Major Russell's tannin process, Mr. Noton's compound albumen process, Messrs. Petschler and Mann's collodio-albumen process, and Mr. Wardley's suggestion for development of the image on dry plates without the addition of free nitrate of silver, recently descanted upon at length by Mr. Simpson, in a paper read at the North London Photographic Association.

Celestial photography has undergone considerable development, and received much attention, chiefly at the hands of Mr. Warren De la Rue; and, as we noticed in our last, microscopists appear to be again turning their attention to photography as a means of recording the numerous observations that can be delineated by no other graphic art.

In apparatus many useful inventions and handy contrivances have been introduced, but we much question whether there has not been too great a tendency to complication manifested in the construction of cameras.

Upon the whole, we do not think there is any reason to be dissatisfied with the progress that has been made; for it must not be forgotten that the nearer we approach towards perfection the smaller is the apparent advance that it is possible we can make, while every step beyond a certain point is attended with an immensely increased effort for its accomplishment. A railway train at a high rate of speed may be driven by the expenditure of a certain amount of fuel; but the consumption of double the quantity will make but a very small additional per centage in the rate of speed attained. Again: if an "exposure" be of ten minutes' duration, a reduction of the time to one-half appears to be a great advantage gained; but that of reducing a tenth part of a second of time to one-twentieth is comparatively unimportant.

A view of the past year's occurrences, however hasty, would not be complete did we fail to notice the retirement of one who, for some months after the commencement of the present volume, was a fellow-labourer with us in catering for the entertainment and advantage of our readers; and it is no disparagement to those who are still associated with us in this work to say that he was, in our estimation, the most valued of our contributors. We long sought to induce him to accept an equal responsibility with us, or even to take our post at the helm, but without success; and the reason we were unable to persuade him will be at once apparent when we state that our observations apply to our highly-valued friend, now the Rev. T. F. Hardwich.

In conclusion, we feel it would be in vain to offer the usual wishes on the advent of another year, because, however much we may hope for the continuance of peace and good will, the most sanguine amongst us can scarcely expect it; we trust, however, that should the nations now in expectation be unfortunately plunged in strife, that strife may not extend to the peaceful followers of a civilising art, but that "the winter of our discontent" may be "made glorious summer by the Sun * * *"—and "all the clouds that have gathered o'er our house" be, ere long, "in the deep bosom of the ocean buried."

ON A PRELIMINARY COATING FOR COLLODIONISED PLATES FOR THE TANNIN PROCESS.

By Major C. Russell.

During the last few weeks I have been investigating various ways of fixing the collodion film when used with tannin, and have obtained the following results:—

Gelatine solution, prepared with acetic acid, is much improved by adding, for every ten grains of gelatine, two grains of iodide of cadmium, one grain of bromide of cadmium, and a very small quantity of iodine, dissolved together in a few drops of water. Besides giving other advantages, this addition prevents the gelatine film from being attacked by fungus when kept before being covered with collodion, and therefore a large number of plates can be gelatinised at once, and kept without any extraordinary precautions against damp. No alcohol is required in the solution.

I have never observed that the gelatine caused any diminution of sensitiveness, except when, from mismanagement, it permeated the collodion to the surface and caused less opacity. This will occur with a bad sample of gelatine, such as common glue, or from using a thin film of decomposed and porous collodion on a thick coat of gelatine, or from the acetic acid not being dried out. Gelatine solution, prepared as now described, certainly does not, in my hands, affect sensitiveness in the slightest degree.

I have been using solution of India-rubber for some time past with such success that I am inclined to agree with Mr. Glover that, on the whole, it is the best thing to use. I cannot, however, agree with him as to the cause of the cracking of the film; for I have never used India-rubber for this purpose without drying it by heat, sometimes exposing it for a long time to a higher temperature than that used in varnishing. At any rate, omitting to dry by heat is not the only cause of the annoyance in question, for if the solution be too thick no amount of heating will prevent subsequent splitting: with a very thick solution the film will split while drying spontaneously in a cool place. I formerly condemned the India-rubber because I found that, while a thick layer caused the collodion to split, a thin layer, though free from this objection, did not produce sufficient adhesion with some kinds of collodion, and my purpose was to avoid the necessity of using a decomposed and insensitive sample. The following method of working will, however, be found to be quite satisfactory:—Cut raw India-rubber into very thin slices and soak in benzole, one grain to each fluid ounce, for twelve hours or more, and filter. After cleaning the glasses, warm them to ensure dryness, and allow them to become cold again; then pour the solution in the same manner as collodion, and, before the liquid has ceased to drip, dry by holding the plate vertically before the fire at a short distance. The film produced in this way is as bright as the glass itself, and is always perfectly free from markings. Each plate, as soon as it appears dry, should be set up before the fire, near enough to keep warm, that the drying may be completed whilst other plates are being coated.

Before being covered with collodion the surface should, as in the case of a gelatine film, be well polished with a velvet rubber, or the collodion will not flow very freely.

In the usual way of working this thin film of India-rubber will not always produce sufficient adhesion, but it succeeds perfectly if diluted alcohol is used to moisten the collodion before development. So little tendency to loosening of the film is thus produced that most samples of collodion may be used in this way without any previous coating, but not quite satisfactorily, as the film will sometimes be loosened and broken when washed after fixing. I am indebted to a correspondent of the *Photographic News* for a knowledge of this important use of alcohol. One part of ordinary alcohol (not methylated) to two parts of water answers well, but the exact proportion does not seem to be of much consequence. This liquid flows so freely that it may be poured on the plate, and spread over it by blowing gently. The same portion may be used for a number of plates.

After pouring off, the greater part of the alcohol remaining on the film should be removed by pouring some distilled water on and off a few times.

Tannin plates on India-rubber treated in this manner will bear a boiling developer without the film being loosened.

Benzole answers so well, if used as described above, that it seems hardly worth while to try other solvents; but I have been informed that chloroform succeeds well. A long time ago I tried turpentine, but the result was not very satisfactory. I have not tried mineral naptha, but, unless it produce a film hard enough to bear polishing, benzole is to be preferred.

Collodion, decomposed by keeping, may be improved for use with tannin by adding ten or twenty drops of benzole to each ounce, or as much as it will bear without being rendered too impervious. The benzole throws down a gelatinous precipitate, which is re-dissolved by shaking, and the collodion is rendered much more close and horny in texture. If too much be added the film will be almost impervious, and will repel water like gutta-percha. Some thin slices of India-rubber should be digested in the collodion for some days before use.

This treatment does not appear to affect sensitiveness, but renders old collodion available for printing transparencies, or for other purposes where time is not an object. No previous coating will usually be required if diluted alcohol be used to moisten for development. The effect of benzole and India-rubber in sensitive but somewhat porous collodion will, I think, be worth investigating. Tannin plates are often complained of as insensitive, whilst in my hands they are much quicker than collodio-albumen, when a suitable collodion is properly treated. When the sky or high lights appear before development on properly exposed plates the collodion is insensitive

HINTS ON THE NATURE OF PICTORIAL BEAUTY AND THE PRINCIPLES OF COMPOSITION.*

By W. H. Davies.

No. I.

It cannot be expected in a subject of this nature that I shall be able to bring much of originality in the matter of it before you. So much has been written and spoken of it that the fundamental principles to be treated of tonight are matters almost quite beyond the reach of criticism. They have become, as it were, matters of fact or faith, and as such, however much they may admit of elucidation and comment, stand in no need of aid to establish them, least of all do they need words of mine to help their establishment. While this is so in reference to the principles by which pictorial representation is guided, it cannot be so said of the ideas by which we are led to desire and taught to judge of those representations; at least I so judge by the question put to me by our worthy Vice-President, Mr. Slight, when I read my last paper on the elementary rules of landscape composition. It was to this effect—Why is it that we prefer, pictorially, a curve or irregular line to a horizontal or perpendicular one? Or, why is it that we like one form or set of forms rather than another and quite different set? Why some are beautiful, and some are not?

This question strikes at the very root of all imitative art, whatever form it may assume, in whatever material it may be represented, or by whatever means produced, and is therefore worth consideration were it only to allow us to inquire into the nature of Beauty, as to whether it is merely an emotion of the mind or one of the attributes of nature—a physical entity, a tangible something; or a metaphysical idea, an intangible nothing—as this underlies the whole question, and upon a solution of it depends all philosophical criticism of the beautiful in nature and art, especially of the latter.

It may not be possible here to go thoroughly into so abstruse a question, but enough may be said to show superficially that that attribute of things we call "beauty" is really a part and parcel of their nature, and that however much it may be heightened or lowered by the feelings and emotions then reigning in the mind of the spectator it is still essentially different from the ideas raised in him by gazing on it; or, in other words, that certain forms, shapes, colours, or objects have the quality of making us like or admire them in a high degree, while others have not this quality in the same or perhaps any appreciable degree. While I hold that in nature there is nothing absolutely ugly, yet I also hold that we have a comparative scale which we apply to all objects, and consequently express ourselves in different ways about different objects or scenes; and while so feeling we know that it is not every or all of these objects which are capable of being represented pictorially, and also that we must not judge nature and all kinds of art by the same rules. Thus, while I say that a curve is better pictorially than a straight line, and that lines in pictures should never form right angles except for a special purpose—this, although absolute in pictorial, is not so in decorative art, which must be guided by its own rules, one of which, apropos to this point, is that no ornamental design will be perfect that is *not* composed of angles, straight lines, and curves, and right in preference to acute angles. Another rule is that symmetry, proportion, and repetition alone will give decorative beauty, while the same rule alone applied to produce pictures would be a sure destruction of pictorial effect: and we cannot, and do not attempt to apply any of these rules to nature, but only to the imperfect means we adopt to represent the perfect and great in nature.

The actual WHY it is that we prefer wavy, curved, and irregular lines in a picture I do not know, unless it be that in nature we are most accustomed to them: they are the principal lines, and reared as it were among such lines and forms we insensibly prefer them, on the same principle that the Bedouin loves the desert, the Highlander his glen, and the Esquimaux his home among the eternal snows of Greenland; and, indeed, if we think for a moment we will see that there is no possibility of the cosmopolitan looking with the same eyes as do their denizens on the desert, the glen, and the iceberg: this therefore may be taken as a proof of that position. The beauty of the scene is not diminished to him, but the emotions raised are full and overflowing in their case and hardly above zero in his.

Straight lines also are not common in nature, and indeed may be said to be absent, except in the cases of crystalline substances and still or distant water, and where they occur on a grand scale, as in sunsets at sea, where the long, low, and sometimes parallel clouds come in repeating lines with the horizon, and the heavy rolling swell of the waves, as they come heaving towards you like a series of great rollers, alternately rising and falling, without a break on their surface, as if they formed an undulating sea of glass which kept moving on in resistless majesty by its own volition. This, were it only from the great size of the objects, the wide stretch of space we take in at one view, and the almost indefinably awe-struck feeling with which we contemplate the silent and irresistible sea is very striking and very grand. But let any one attempt to represent this pictorially, and we should see what a comparatively poor affair it would be, without an object to break the monotony of the long parallel lines or to give variety to the scene, or without the motion and sounds of nature or sense of its mystery; and, even granting it all the beauty of colour we get in the best sunsets, yet without the emotions raised by the spirit of the hour and the associations inseparable from it—which are impossible to be rendered pictorially in a scene such as I have sketched—it would be like looking at a doll-like corpse instead of a scene almost sublime by its very monotony. Not so is it with such portions of many-sided nature as are capable of being represented pictorially by the great ones in art. Then you have, as it were, a living, breathing reality—a window opened in the wall through which, as through a glass, you see a chosen bit of this world of beauty, of grandeur, or of ideality.

Cast now the retrospective eye of your mind over the human race in its progress through all time, and over the globe, and we may safely affirm that there is not a single object in Nature which has been looked on by man or a single phase of her multiform appearances that is not, or has not, been beautiful to some one or other of our brethren in humanity—and that, therefore, we are not wrong in saying that the domain of beauty is illimitable, although there may be differences in the perception of it, because all our ideas must pass through John Bunyan's eyegate of the "City of Mansoul." This gives us at once a key to the different opinions held, and the ideas created by the same objects on different minds, because our eyes are as our hands are—one man with his camera and chemicals will give you a most excellent transcript of nature, while his pupil say, or another, with the same materials, will supply you with an unsightly blotched daub, although in course of time, and with a wider experience and practice, he may, perhaps, surpass his teacher. Again: one man with a hammer only for tools will block you out a vase or a jug with the most exquisite outline and delicate curves, pleasing and gratifying the eye of the most fastidious; while another can do no better with the same instrument than break stones for the road, or hew a block from the quarry for a sculptor, who again with his hammer will knock away, as Michael Angelo expresses it, the asperities and chip the excrescences from it till he exposes to you the statue that was hidden therein, but visible only to the mind of genius. So with our eyes: one is trained to appreciate the most delicate tints and is gifted with the most subtle organisation, while, alas! every twentieth man we meet cannot distinguish between the hues which give such pleasure to the perfect seer, so that it is needless to expect that the same objects will affect all minds equally; and, as long as this is so, just so long will there be differences of opinion as to what constitutes beauty.

In the wide domain of nature there are so many qualities which excite this emotion, the limits of our comprehension seems to be the only limit to our perception of its universality, and thus, doubtless, it will ever be—the mind with the highest amount of intellectual culture will ever be able to see and appreciate the greatest amount of beauty in the most differing objects which surround us, whether they may be merely mental or subjective—as in such examples as truth, association, fitness, contrast, expression—or objective, as in external nature with its life, forms, colours, space, and variety, its trees, clouds, and rocks, all of which abound with its presence: as for instance in the bursting of the bud and the unfolding of its delicate leaves; in the dewdrops clustered on the hedge-row or on the fairy-like gossamer web, sparkling like brilliants as they are touched with the morning sunbeam; in the graceful bends of the grasses, as they turn their heads to bow to their vivifier; in the glory of the summer flowers, springing up like gems from the dry earth, shaded by the delicate green of their leaves, and forced into beauty by the contrast it affords to their brilliancy; in the mellow magnificence of autumn, with its winds sweeping over the ripe corn, likening it to the billowy swell of the unquiet sea; and in the glorious colours painted by the hand of the dying year on the foliage of the trees, on the grasses of the fields, and the heaths of the mountains: all—all are filled with its presence; and, as if to show that Nature cannot exist without it as an accompaniment,

* Read at a Meeting of the Edinburgh Photographic Society, December 18th, 1861.

the very shroud of stainless snow in which she wraps the corpse of the dead year is made in appearance fit to be the wedding garment of a bride.

In another direction we may see the sullen majesty of the monarch mountain with a storm cap of cloud covering his hoary head —the sweet placidity of the lake nestling at his feet: now a mirror in which he may gaze till he seems "rocked on the skies of a far nether world," and anon a stormy sea lashed to fury by the wild winds that rush frantically down the valley bearing death and destruction on their wings. These aspects of nature and a thousand others are in themselves beautiful and the causes of beauty.

Thus I think that, although I may not have demonstrated, in reply to the Vice-President's question, why we like particular forms and lines—and perhaps could not without making an excursûs into sundry metaphysical and out-of-the-way subjects for which you would not thank me and which would not report well as the proceedings of a photogaphic society—yet sufficient has been said to show that beautiful objects and the elements of beauty lie around us on every side, and need only proper setting, as jewels do, to show their loveliness to all beholders. This setting is for us, as for all artists, pictorial arrangement, and without this the best materials and most picturesque subjects are comparatively valueless. What would we say of a merchant who, after spending a fortune on a magnificent collection of goods, piled the whole in an *olla podrida*, without regard to their use, or fitness, or harmony, or order—here a Cashmere shawl enveloping a Stilton cheese, or there a jewelled bracelet among a stock of Batavian pickles and spices, or yonder a gold watch keeping time among a lot of samples of rare old vintages? You can easily conceive the converse of the picture: the cashmere shawl undulating gracefully over sweetly-moulded female shoulders, its delicately subtle curves and gorgeous yet quiet and quaint combinations of colour shown now to the fullest advantage; and the bracelet, too, which had its place among the spices, now transferred to her arm, flashing forth its jewelled radiance with every movement; and our gold time-keeper changed from its duty of decorating the black bottles to the task of adorning and completing the bearer of them all, making a perfect picture well arranged. On the other hand, we might easily make a very nice arrangement with the Stilton, the wine, and a biscuit at lunch time: *that* would be the *fitness* of things illustrated. Need I say more to prove the necessity of a picturesque arrangement of our materials, especially after having shown in my former paper that *we* are restricted to one-half or less of the advantages of painters, they having the power of rejection and improvement, and the assistance of colour—the first of which we have but in a limited degree, the second and third not at all, being restricted to light and shade and stern reality. And if we are to establish our claim to the name of artist, and obtain for our art a pedestal in the temple of fame, it must be by showing that, in the restricted field we at present have, we can render more perfect service to the world than drawing or engraving has ever yet done. I say at present; for who can say how soon the key to that secret of nature may be found which will enable us to reproduce every tint and gradation of that chromatic scale which the eye naturally delights to revel in? Then it will be found that it is we who are the true artists of the REAL, and painters will have to take to high art and become its exponents in the more transcendental regions of the ideal.

I must now draw this part of the subject to a close; and, while doing so, I hope you will not think that our worthy Vice-President's question has been uselessly or *slightly* put or deserved to be *slightly* answered. Sometimes it is more pleasant to ramble quietly along a country road taking a peep up each by-path, and plucking a flower here and there—

> Where the tangled barberry bushes
> Hang their tufts of crimson berries
> Over stone walls, gray with mosses.

Sometimes it is better to so do than to rush with the speed and directness of an express train to our destination, as we come to it with a mind more tempered to a quiet, intellectual pursuit such as we are at present engaged in.

In all the imitative arts invention holds the first place: without it there is no originality. We cannot compose anything which is not first conceived. The mental faculties must first create or realise the idea which it is the province of composition to arrange and dispose in a judicious manner. Invention, then, consists of the choice of subject, the best time for representing it, and the selection of such materials and circumstances as, combined together, will develop the idea in the best way. Composition, on the other hand, takes those materials, and, by a judicious disposal of them in the most effective manner for the purpose desired, brings out of the chaos of materials provided and selected by the invention the perfect arrangements desired by the æsthetic faculty. Its chief merit consists in making the arrangement of the finished work of art seem the most natural effect of mere chance, as if every object were in its proper place, and that the whole—which is really the effect of the most studied art—was merely a simple copy of what must have been taking place on the spot at the moment chosen to illustrate the idea. Good composition will, therefore, equally avoid that simplicity of arrangement which is merely stupidity, and that complicated grouping of figures and objects which is either the same thing or affectation, and strive to hit the happy mean—the best proof of the possession of which will be the discovery that we are only struck by the truth of the picture to nature, and never think of the composition at all. "The best art is that which hides the art employed in it." Composition, then, being a matter of arrangement or disposition, is, as such, and to a certain extent, under the dominion of rules which have been formed from observation of its principles, and which I will try to shadow forth in the course of this paper.

It will be necessary first to speak of the principles concerned. They are, as I showed in my last paper, four in number; and, for convenience, invention is taken as one of them. I recapitulate, so that we may not wander in our references, and because *they* will be none the worse for being twice told, and *we* none the worse of twice hearing them.

The first is, that in all compositions in which figures occur there must be some story or incident to show or relate, however trivial or slight, or however involved or complicated it may be. The second is, that the most prominent, striking, or leading lines of the picture must be so arranged as to have an agreeable outline and not ungraceful form. Third, that it be so arranged as to its light and shade that the principal object or incident comes naturally to occupy the most prominent part of the picture, and the secondary portions to subside, by due gradation and subordination, into their respective positions, so that it may produce a perfect whole. Thus far photographers and painters equally need to apply these principles. The fourth applies exclusively to painters, and it is that the composition be susceptible of a harmonious arrangement of colour. Of course there are other subsidiary or secondary principles which can, in no wise, be departed from—first among which must be ranked Picturesqueness, or that quality which gives a picture, of whatever materials it may be composed, the attribute of pictorial effect.—2nd. Breadth. This is an almost undefinable term for a very tangible reality: it is that quality which gives a picture unity of treatment, harmonious arrangement of the forms and places of lights and shadows, and concentration or mass in contradistinction to spottiness and weak scattered effect.—3rd. Contrast—by which is meant the mode of producing relief by projecting light against dark and dark against light, or light against lighter and dark against darker.—4th. Gradation—which breaks and harmonises the harshness of positive light coming into immediate contact with positive dark, and, by doing so through the whole scale of shade, produces just and due subordination of effect between all the objects in the picture. It has also for its office the rendering of aërial perspective, and the effect of distance, by softening imperceptibly the various objects as they recede from the eye.

These may be taken as the chief points necessary to be observed and acted on; but, as didactic illustration or enforcement is never so effective as object teaching, I propose to take the various principles I have enumerated and comment on them *seriatim*, subdividing them, where necessary, for the sake of clearness. I beg also to say, while showing the illustrations, that if any of the members have any questions to put—not, of course, for debate, but for elucidation — they may be put as I go along in as few words as possible, as there are often little matters one omits to mention and seeming contradictions, it may be, which require further statement, and so on, and which, if spoken of at the time, while the subject is fresh, is apt to be better brought before you and the sense better given and retained than if they were suffered to pass, as they often are, and be lost sight of at the end of the meeting in the discussion of more important matter.

My first proposition — that in all figure compositions there must be some incident depicted, however simple it may be, or however complicated—does not necessarily imply that we must invent the story or incident, but infers that we may choose it from any source, as we have always plenty of variety to make a pleasing picture in the figure and the accessories. We cannot, like the poet or the novelist, lead

he spectator through a series of incidents connected by narrative, up to the point chosen to illustrate. No: we are fixed o one incident to which all the rest must be subsidiary, to one ction, and to one moment of time. We may indicate what as gone before, and what may be to come afterwards; but this an only be by suggestion, not directly. What we can do is this: f we have a group to photograph, we can determine what we hall make them do, who is the most proper to be placed in such nd such a position and doing such an action, and so proceeding ill everything is arranged on this settled plan, together with the nost suitable accessories, background, &c., to complete the picture.

The most common and, perhaps, the most needful purpose to which photographers can put a knowledge of figure composition is portraiture, although I by no means urge that as the only use we can put it to. This would be a sad limitation of our art. In he fifteenth and sixteenth centuries the Florentine and Venetian painters were at their highest, and were famous for their style of reating portraits—making the grave senators and nobles do duty is apostles, sages, and heroes in appropriate pictures, but with very inappropriate costume—using them pretty much as the camera would do now-a-days with the ordinary dresses of the period, which, nowever, were very picturesque. This style, although not impossible, is highly undesirable. There are, however, many of the great painters whose portraits are perfect mines of study, and, by taking them as models, we may learn a very great deal. I allude to such men as Titian, Velasquez, Vandyke, Reubens, Rembrandt, Netcher, Mieris, Metzu, Terburg, Lely, Jameson, Reynolds, Gainsborough, Lawrence, and Raeburn—names which are but a small sample of the choice you have, and who are all standard men. I need hardly say I do not advise slavish copyism of their works, but rather to study them, so that we may arrive at a knowledge of how the various effects are got, and use them for our own purposes. If the principal charm of a painter be his colour, he will not be a safe guide for us; but if his works engrave well—if they render into black and white truly, and lose little of their charm in that medium —that is the master we must study. What I want and insist on is, that photographers should infuse their mind into their works, as the old painters did, and as all great men in any art or science do: we are not all admirable Crichtons, who can take the royal road to success, and, therefore, if we expect immortality for our productions or ourselves we must copy their example, for works on which no thought has been expended will not live long. But it may be asked—Are we to be expected to produce works to rival or equal those great minds who stand pronounced the masters of their art? I say yes: there is no reason why we should not be able to develop as fine ideas, with as excellent composition and arrangement, and in our own medium and way produce to the full as fine works as the best of the old masters in all save colour; but, to do this, there is no way but by patiently learning the difficulties and surmounting them—by educating the faculties to the highest—and by doing as they did, making our art the business of our life: then we may expect to see a similar spectacle to that visible in the world of painting. Here and there, at intervals, we shall see a master arise whose works will draw commendations from all men, and his name be famous—the worthy master of numerous pupils all anxious to equal or surpass their teacher, and all aiming at the highest qualities attainable in their art. Such a sight will go far to assist in the more public recognition of photography as a fine art.

The second principle, as I said, is that the arrangement of the prominent or leading lines of the picture should possess an agreeable outline and a not ungraceful form. It must seem to you that, in insisting on the main lines of a picture being of certain appropriate forms, I am inclined to put too much value on this condition; but if you consider for a moment that these lines are really the skeleton, the bony framework, as it were, of the picture, you will see at once the necessity for the utmost care in the selection of them. If we wished, like Frankenstein, to construct a perfect man, we would not begin by giving him a crooked spine or a wry neck, or one leg shorter than the other, or both like a pair of callipers, or only one. No! we would take especial care at the foundation that all the mechanical work should be perfect. Just so in a picture: we ought to be careful to see that the foundation—its framework—should be as perfect as possible, the more so that it is in the composition mainly that the photographer can show what artistic power is in him. Good manipulation, clean negatives, and clear vigorous prints can all be got by attention, care, and practice in the mechanical portion of our art; but it is in the arrangement of the subject, its breadth, its light and shade, its gradation, its treatment, in short, that the mind and education of the artist shows itself.

While I thus urge attention to the very rudiments of composition, I do so on the same grounds that we are taught to make our glass plates clean, have our baths slightly acid, and so on—all with the intention of producing good negatives. And with a similar desire to have good *pictures*, I am anxious that those who have not yet applied themselves to this study should do so now, so that they may learn how to charm the æsthetic faculty, as well as how to please the taste for manipulative skill; and there is no doubt that by mastering the principles and applying them it can be done.

All pictures may be analysed into lines, and by taking the figures as lines we may determine exactly how our pictures may be made up. We have a wide range of forms on which to work. There is the circular and elliptical—as exemplified in the Cartoons of *Ananias* and *Paul Preaching at Athens*, and in the *Transfiguration*, by the same immortal hand—the simple curve or semicircle, Hogarth's line of grace and beauty, the pyramidal, the wedge-shape, the diamond, the oblique line, and many others, besides the accidental combinations which may be daily seen. Whatever form is chosen you may proceed in your grouping as Haydon recommends in his lectures on painting, and I will use his language as being infinitely more to the point, and carrying with it more weight of authority than I would dare to use:—"Whatever be the inclination of the line of the principal figure, or principal part of that figure, that inclination as a line must be repeated by the inclination of other figures on parallel but not equal lines except for a particular purpose. Then, on the principle of contrast, other figures taken again as lines must reverse the inclination of the line of the principal figure; and, by a judicious balance and repetition of one inclination against another, always giving the inclined repetition of the princial figure and all its parts the superiority, you will compose your composition in quantities and lines. This is the basis or anatomy of all arrangements of any given number of objects in painting and sculpture—[why not in photography?]—and applies to every species of art—landscape, animals, portraits, still life, sea painting, or in any style or department where more than one object is to be arranged." Can anything be more lucid or to the point then these few sentences? He proceeds to say:—"The leading repetitions of line may be three—one predominant. The leading lights may be three—one always brightest. There may be three masses of shadow—one always the darkest." Although I would not have you to believe that all pictures are right which are produced on these principles, or that it is impossible to produce bad pictures if you act on them, yet they are valuable as being the principles on which the greater number of the fine pictures since the discovery, or rather rediscovery, of *chiaroscuro* and its adoption by Leonardi da Vinci have been painted. They are to us, therefore, proved principles, and, as such, worth adoption—although not to the exclusion of others as valuable. In the application of the triple system of repetitions, care must be taken that these do not form straight lines or regular forms in any direction, but rather be, as it were, if lines were drawn to connect them, an irregular triangle with none of its sides equal; and also that they be so broken, varied, and hidden, as not to be visible at a glance, but so arranged as to need to be sought for rather than to court your gaze.

As an illustration of the difference between graceful and ungraceful lines in a portrait, take this photograph, which may fairly be called a perpendicular composition. It is in pose bolt upright, stiff, and soldier-like—in fact no man of sense or taste would volunteer to remain in that attitude a moment, far less for ever, or at least so long as the negative lasts. You see at once there is no ease, no grace, no picturesqueness in it. We associate in our minds with that position constraint, exertion, pain, and perhaps pipe-clay. He is a complete specimen of angularities, squareness, and perpendicularity. This is no portrait of the man: it's a map or a chart or a front elevation of him—not a picture in any sense of the term. A picture has beauty—this has none; has grace—this has none; has background—this has none; has accessories, it may be —this has none; has arrangement—this has none, but bad arrangement: in short, as *Micawber* says, "its a—nothing particular."

Contrast it with this portrait, where the body has an easy bend and rests on one leg, the other, being rested, is ready for a change; the pillar supports the arm, and although this is a conventional arrangement, it is here put to the best use; the head well poised and the eyes *not* staring at the camera; the draperies well arranged, so that the lines are sweet and flowing, and yet broken where needed. It tells its own story. You see he has just come in, and, with his hat in hand, has rested at the pillar; but something occurring on his right has attracted his attention—he has lifted his head, and so gazes earnestly in that direction. It is a good picture,

everything about it being associated with ease, grace, comfort, and relaxation: the figure takes the form of Hogarth's line of grace and beauty, and the whole composition is pyramidal.

In these two examples the arrangements are of the most simple kind: in the next, which is still a single figure, the composition is, perhaps, as happy a specimen of how a portrait may be so combined with accessories as to become a fine picture, simply by virtue of the skill shown in grouping and lighting them. It is a photograph of the picture, by J. Noel Paton, of *Luther in his Cell, at Erfurt.* In looking at this, you see the face and figure are sufficiently shown to be a portrait, while, by the early morning light being made to pass in a diagonal line through the half-open window —into which, with it, the convolvulus peeps to see the worn student at his books—it catches and lights up his haggard face and disappears faintly in the gloom beyond, giving sufficient force to the head, while keeping the rest of the picture in due subordination to its main object. I will not waste your time by a lengthened eulogium on, or detailed analysis of, the composition of the picture, but rather direct your attention to it as affording another method of using the pyramidal form of design in portraiture, and to show out of what simple materials (such as are to be found in most photographers' studios in fact) the artist can create a picture which we may study with so much profit. The books, the table, the inkstand and pens, the lamp, the hour-glass, and other furniture of his cell, and the figure itself, are all common enough: it is the consummate skill displayed in the arrangement, the selection, the grouping, the expression, that enchain us and compel us to recognise this as a great work of art. Turn your attention now to the picture beside it, which is a good photograph of one of our well-known philosophical instrument makers and chemists, with a portion of his apparatus beside him, and you will see what the *mere* photographer has done with the picturesque materials he had to arrange. He can do no more than rest him supinely in a chair—can put into his face no life, into his body no action, into the action no story, into his apparatus no picturesqueness—can make nothing of him at all, but construct out of him a mere map of a stolid bit of humanity. Could you have a better example of the comparative uselessness of good manipulation and vigorous prints compared with artistic arrangement and fine treatment? In the one case the artist creates an interest in the subject; in the other it is quite destroyed.

I would not be understood, from these remarks, to mean that photographers have not produced good pictures of the same class. Here is one, by Lake Price, of *Don Quixote in his Study*, which, from the arrangement of the still life, the picturesqueness of the light and shade, and the pose of the moon-struck Don as he meditates over one of the fine episodes of Amadis de Gaul, shows the power the artist possesses over a rather indifferent model and a difficult subject, and proves that photographers may compose pictures which may, at least, be spoken of in the same breath with Paton's or any of the others you see around you. A few better known and easier obtained examples of the arrangement of single figures, pictorially, may be gleaned from among the pictures of the Vernon Gallery, engravings of which have been so widely spread by the *Art Journal*, and which may be referred to as being sufficiently well known to all present. This is Pickersgill's picture of *A Syrian Maid*, a half-length figure, which may be studied with advantage, as a picturesque yet natural position for a girl to place herself in. You have there no staring at the camera or the spectator; the lines of the figure and of the drapery are sweet, graceful, and flowing—the action simple and natural. Being an Oriental, and therefore skilled in the language of flowers, it needs no great stretch of imagination to see that in the bouquet she has received a floral love-letter, which she is perusing with evident pleasure to herself and us. The arrangement of the light and shade is very perfect in its gradation from the brightest light to the deepest shade, while the reflected lights and half-tints are cleverly managed. Any lady-sitter for a portrait might easily be arranged so that the lines would fall in a similar manner. Here is such a figure in full length. At the time this was taken there was no thought of the *Syrian Maid* in my head, but the position seemed to suit the figure, and so was chosen. You will see at once, by making allowances for differences of costume and personal appearance, that they are both arranged on similar lines: the action is somewhat similar, and it produces like it a pleasing effect. Charles Landseer's *Clarissa Harlowe* (engraved in the *Art Journal*) is another and the last of the single figure subjects I intend speaking of. You see the simple nature of the materials is not very different from those of the *Luther*, the addition being mainly furniture, a bed and fire-place. The principle on which the two pictures is arranged is the same: the light comes from the same side and in the same direction. The figure takes much the same form, although the colour is here reversed, being dark in the one instance and light in the other. The breadth of shadow contrasted with the gleam of light from the sunshine of early morning is the same—the darkest part of the picture being on the right, immediately under the brightest light in both cases. The light face and figure, contrasted with the darker tints of the wall behind, is simply reversed: the general repose and harmony all assist to make a not very fine picture in the higher qualities of expression teach us a good lesson on composition.

As it is so late I will here close the present paper, and on a future evening will take up the topics I have left untouched tonight—at the same time feeling somewhat sorry that I have not been able to complete the subject in one reading; but as it is a matter which really requires much study, I have the less objection to trench upon your goodness. Before sitting down I would like to indicate what the next paper will contain, in order that you may be prepared for it. We have now a very excellent National Gallery, which, although not by any means equal to the London one, is still well worthy of being put to its proper use, viz., that of a place for study. I will therefore, after completing the illustration of two and three figure subjects, choose a few of the pictures we have there as examples of the various principles I have indicated. They will be No. 327, Duncan's study of Titian's *Portraits of the Marquis de Guasto, and his Wife Mary of Arragon;* No. 208, *John Knox Administering the Sacrament at Calder House*, by Sir David Wilkie; *The Marriage of St. Catherine*, by Albano (No. 54); and also one not there, Noel Paton's *Home: Return from the Crimea.* And I would advise all who care in any way about this matter to examine those pictures thoroughly by the light of the examples and principles I have given; as they must be sought out for and by yourselves—they must be felt—they cannot be taught, except in the most perfunctory manner.

(To be continued.)

THE ORIGINAL FOTHERGILL PROCESS.*

By S. Bourne.

Perhaps no process in photography has had more said or written about it than that which we term the "Fothergill process." At one time the journals were filled continually with papers, discussions, and correspondence in reference to this popular discovery; and I confess that I am most reluctant to add to what has been written, and to trouble the Society with another paper on this almost threadbare subject. But as I was requested to do so by our worthy President, and as Mr. Hill would not let me escape, I must make the best of it, promising that if any member should feel disposed to compose himself for a comfortable nap until the reading of it is finished, I will not disturb him. *Apropos* of this I may remark, *en passant*, that a photographer living in the provinces, and unaccustomed to attend the meetings of any photographic society, has doubtless an imperfect idea of the feelings which sometimes pervade these meetings. The reports in the journals, I fear, do not always give a correct notion of the kind of reception a paper meets with; and the intimation at the end that a vote of thanks was passed to Mr. So-and-so, for his "interesting paper," gives but a faint idea of the inward grumbling and uneasiness, the gaping and listlessness, manifested by the majority while this same "interesting paper" was being read. In such a case the author of a paper has an advantage in being absent, since he is likely to gain a more flattering idea of the reception it meets with from reading the report of the meeting in the journal than he would have done had he been present. But if I may be allowed such a digression, I should like to wake up some of the gentlemen who attend meetings simply as critics or listeners, and ask how it is that they do not take a more active part in furthering the progress of our art? How is it that, in a Society numbering over a hundred members, photographers in the country get the impression that it contains only some twelve or fifteen? Why are the names not seen, nor the voices heard, of the great majority? Has nothing occurred in *your* photographic experience capable of interesting and benefitting your fellow-students? Why not, then, throw it into the common stock, and instead of ceaselessly ringing the changes on a few well-known, cherished, but over-worked names, step forward yourselves and put a shoulder to the wheel, and you will not only receive the thanks of President, Secretary, and Committee, but of

*Read at a Meeting of the North London Photographic Association, Dec. 16th, 1861.

hundreds whose isolation from all photographic intercourse causes them to look forward to the proceedings of these meetings with great interest.

The object which, in this paper, I have specially in view is not to introduce another "modification," or to carry you through a labyrinth of experiments to determine the value of this or that "suggestion." My object is of a more practical and, I hope, useful character. It is simply to describe the exact method by which the specimens now before you were produced, and which method, I think, will be found to differ little from the simple and excellent formula originally published by Mr. Fothergill.

In these days, when so-called photographic discoveries succeed each other with such startling rapidity, we have scarcely time to test the value of each new candidate for our suffrages before we are summoned with a great noise to throw it up and pay our devotion at the shrine of one more worthy than all, and guaranteed to give universal satisfaction. If we are young enough in photographic experience, and green enough to obey the call, it is, most probably, to find ourselves in a short time perfectly ready to relinquish even that for the next new comer. Amidst this ceaseless change and accumulation no wonder that the old and generally best processes lie buried, if not forgotten. Such being the case, if one can be found who, through all this change and universal thirst for novelty, has remained faithful to an old, tried, but now neglected favourite—and who, when the new dodges begin to pall on a satiated public, comes forth and disentombs it, and exhibits its sterling worth before his perplexed and disconsolate contemporaries, confers as great, yea, a greater, benefit upon them than the hero of some new modification. If the writer of this paper can, in some measure, succeed in accomplishing this tonight as regards the process in question, he fancies that neither his nor your time will be thrown away, and that some at least will not regret that they listened to yet another paper on this "dry" subject. You will judge, then, that I am not about to describe a process that I have only just taken up. My connexion with the Fothergill process dates from the day of its publication in *The Times* by its discoverer, and since then I have attentively watched its history, have tried it under a great variety of conditions, have now by me more than 200 large negatives taken by it—many of them excellent, and all, I believe, tolerably good—and up to this hour I have never felt, nor still feel, any wish to change it for another, or for any of its recent modifications. My method of manipulation is as follows:—

I always use patent plate glass on account of its superior flatness and smoothness of surface—indeed, for *large* pictures, it is indispensable unless you choose to incur the ceaseless risk of breaking your negatives in the pressure-frame. I always use for this, as I would for all other processes, a bromo-iodised collodion. It possesses two advantages over the simply iodised, viz.: it will bear a more thorough washing without materially impairing its sensitiveness, and it is more impressible to feeble rays of light. That which I almost invariably use, and which produced the pictures in question, is Perry's, of Sheffield. It may not perhaps be better than some others, but when it has been iodised two or three months it appears to be the exact thing required, of a consistency suitable for large plates, producing a film perfectly uniform, and while sufficiently porous in structure adheres firmly to the glass. I may here remark that, in my humble judgment, collodion should never be used soon after iodising, especially for a dry process. When it has had time to settle and become clear as sherry, it not only works free from all specks and comets but far more cleanly and vigorously. The silver bath is of the strength of forty grains to the ounce, and in precisely the same condition as required for wet plates—faintly acid with acetic acid. Here an advantage is possessed by this process over some others: if you wish to take the portrait of a friend you do not require another bath. I frequently take both positive and negative portraits with the one I use for Fothergill plates. In preparing a batch of plates, I first of all put my operating-room in the best possible order, having a place for everything and everything in its place. This having been done, the bath filtered, the washing-bath filled with distilled or rain water, by its side collodion carefully decanted, clean blotting-paper arranged on the drying shelves, muslin tied over the tap to regulate the force of the water, and all *intruders* shut out (if any be present), I commence operations. The plates, of course, have been cleaned and polished in another room, with a mixture of ammonia, spirits of wine, and tripoli—no water being used. When the plate is attached to the pneumatic holder, I take a broad camel-hair brush, kept for the purpose, and remove every particle of dust from the surface, coat with collodion, and sensitise in the usual way. After draining well on the dipper it is immersed in the washing-bath. For this purpose I use a vertical bath, precisely like the one containing the silver solution, as this is by far the most convenient, there being no necessity to remove the plate from the dipper. As to the amount of washing required, I have always contended that it should be regulated by the time the plates are required to keep. I generally, in the summer, take out a large number of plates for a fortnight's excursion. I begin the preparation of them a week or more before starting, and another week elapses after I return before they are all developed. Here you see they are required to keep at least a month—a fortnight before and a fortnight after exposure. Now in the heat of summer no "four drachm" system of washing will do this; and even for shorter keeping no advantage is gained, but great risk incurred of stains and decomposition. I formerly washed the plates under a tap as freely as in the collodio-albumen process, and the negatives I obtained, though requiring a little longer exposure, were of a very clean and vigorous character. But the plan I now adopt, while being more convenient and taking less time than the tap-washing, posesses all its advantages with increased sensitiveness. It is simply immersing the plates in the vertical bath as described above, moving up and down until the water flows freely, and changing the water after every six plates.

The plate having been thus washed and allowed to drain the albumen mixture is poured on. This is composed of white of egg, one ounce; distilled water, two ounces; ammonia, eight minims; chloride of sodium, two grains. The whole is beaten into a froth and allowed to subside, and, when bottled, will keep for any length of time—the older it is the better. I am aware that many operators use albumen much more diluted than this, while others adopt Mr. Hannaford's modification of adding nitrate of silver to it. The advantage of using a somewhat concentrated solution of albumen consists in the tenacity and binding effect it imparts to the film, making it almost as hard and indestructible as a Taupenôt plate. I shall not contest the matter with Mr. Hannaford as to the advantage of adding silver to the albumen. I have but little opportunity for making experiments, and when I have become familiar with a formula which succeeds to my satisfaction I have little disposition, as I said before, to change it; and in this instance, not having experienced any of the drawbacks which Mr. Hannaford proposed to remedy, I must own to not having tried his suggestion. I am somewhat undecided as to the beneficial effects of a chloride in the albumen, having obtained equally good pictures without it. The chief advantage, perhaps, lies in its imparting additional keeping properties, by converting the unstable nitrate of silver left in the film into the more stable chloride. I formerly thought it increased the density of the image, but longer experience inclines me to believe that it rather diminishes it, and gives a softer picture. To proceed with the manipulation:—When the albumen has been made to flow well up to every edge of the plate for about a minute it is washed off freely under the tap. For a 12 by 10 plate I continue this washing about three minutes, holding the plate by the corners. The more thoroughly this operation is performed the better; and the reason why so many find these plates slow in developing is attributable to the preservative not being sufficiently removed. Washing in a dish in two or three changes of water will not do: a moderate force must be employed either from a tap or jug. The plate is then set to drain on one corner, and removed to fresh blotting paper in ten or fifteen minutes, after which it should not be removed until quite dry. Any irregular action in drying—such as completing the operation by artificial heat when the surface is partially dry—will leave a spoiling mark between the two actions, soon rendered visible by the developer. I do not know that I need describe my mode of developing. It is done in the usual way. I use pyrogallic acid, 1½ grains; citric acid, ¾ grain; and 1 oz. distilled water—adding the smallest possible amount of silver, until the details are all out, when I intensify to the proper extent. This plan is analogous to that described by Mr. Simpson at the last meeting, while I think it has an advantage in reducing the time. So much, then, for the manipulation.

It will be observed that the process, as I have described it, differs not from that originally published by Mr. Fothergill, and, as I hinted before, I more than question whether any of the "modifications"—or, perhaps, more correctly, complications—since published are any improvement on his most simple and excellent formula. I have tried several myself, but have always gone back to my "first love;" and, until something turns up in dry processes altogether different from what we have at present, I shall not forsake it again. I do not wish to disparage other dry processes, and

there is little fear that those who, like myself, are accustomed to work one in particular, and succeed, will change it through anything I may say; but I cannot help remarking, for those who are undecided, that no process appears to me so simple as this—none can give finer results when properly manipulated, and it possesses advantages which some others cannot claim. I have already mentioned one or two, such as no special silver bath or collodion being required; and I may mention, in addition, that none of the horrid blisters which sometimes disgust one with the otherwise excellent process of Taupenôt ever show themselves here, and its keeping qualities are greatly superior. Over its new rival (the *tannin*) it still holds its place. It is more sensitive, and there is no fear of beholding your beautifully-chosen and developed picture meet with instant destruction in the final washing; neither have you to give the plate a preliminary coat of gelatine to avoid it—a most undesirable and uncalled-for operation. The possibility of seeing the picture, after all the labour and anxiety it has cost, leave the glass, piecemeal, in the very last operation is to me a fault of such magnitude that I would never have anything to do with a process, however excellent in other respects, that rendered one liable to this contingency: hence the great recommendation possessed by those processes in which albumen is the chief preservative agent. But I fully concur in the statement we often meet with in the journals, in "Answers to Correspondents," that it is not in the *process* but in the *man* that the cause of non-success must be sought for. It is undoubtedly true that good, if not equally good, pictures may be produced by any sensible dry process, when worked with intelligence and careful attention; but it is equally true that the most simple and certain of them must fail in the hands of many—shall I be wrong in saying the majority—of those who dabble in them. From what I have seen of the manipulation of amateurs generally I frequently wonder how most of them ever get a presentable picture at all. The dirty, slovenly, *unthinking* way in which they go about their work is most unpardonable, and becomes ridiculous when it is expected that from such an abuse of all that has been written on photography, and such a transgression of its delicate and inflexible laws, they shall produce something worthy of admiration. I must confess that I have often been disgusted at the sight of negatives that have come under my observation, and from persons, too, who had the reputation of great achievements, and whose frequent communications to the journals led one to suppose that they at least had attained an eminence beyond the reach of ordinary aspirants. It is no uncommon thing to see negatives marred or spoiled by long-tailed comets, caused evidently by dried pieces of collodion falling from the mouth of a dirty bottle when coating the plate; others defaced by a huge stain or two from the corners, caused by dirty fingers; in others, an inch or more of the picture lost by the thumb-hold; others covered with black specks and sundry embellishments (the sure products of an unfiltered bath); some even varnished before the iodide of silver has been removed; while, to crown the whole, some adorn their negatives with a few beautiful scratches, and, if the improvement be not sufficiently marked, dab a few touches of black varnish on the same places, which give to the resulting print fine contrasts of black and white. The pictures which I have the pleasure of presenting to the Society I believe will generally be found free from these defects, and on the whole, perhaps, equal to the average of dry collodion pictures. One fact about their production I must not omit to mention, and that is that those measuring 12 + 10 inches were taken with one of Grubb's lenses for 10 + 8 pictures. Wishing to get a much wider angle of subject than usual I procured one of these lenses, and was pleased to find that with it I could cover a 12 + 10 plate very satisfactorily, and that, too, with a ⅛-inch stop. Unfortunately these specimens do not exhibit the capabilities of this lens to the best advantage, as most of them were taken in dull and even wet weather, which, of course, greatly interferes with the sharpness as well as general excellence of the pictures.

This paper, I fear, has already extended beyond the usual length; but if in closing I might be permitted another remark, it would be this: that, although I have tonight been describing, and in some measure advocating, an excellent and useful process, I would prefer to advocate one capable of producing still better results. The day, I think, has arrived when all our dry processes are weighed in the balance and found wanting. However much we may admire the beautiful productions which some of them have wrought in the hands of skilled workmen, we have seen some yet far above them, and of such surpassing excellence as we can never hope to attain by any dry process as at present known. Those who have seen the marvellous productions of Mr. Wilson—who have been thrown into ecstasies of delight as they beheld the wondrous beauty, the delicacy, and harmony which characterise nearly all of them—who have felt as if transported amid the real scenes there depicted, as they saw the charming landscape spread before them, and its distant horizon melt almost imperceptibly into its own natural sky, or the flood of mellow light which beamed from behind the golden cloud in which the sun was sinking to its rest—who have felt a pensive silence as they stood by the shores of an Aberdeen lake as the shades of evening fell upon, and wrapt all surrounding objects in its deepening gloom—must have turned from the contemplation of such pictures, or rather I should say such realities, to their own poor productions with a feeling of dissatisfaction and almost disgust. These have now lost their charm and their power to please, and henceforth we can be content with no process that does not give us all the gradations of a distant landscape in true and softened perspective—that does not reproduce on the sensitive tablet every cloud that may adorn the sky the moment our view is taken—that does not fix the dashing waves and rising spray of the ocean, and at the same time carry our eye over its wide expanse till it rest on the diminutive bark which serves to mark the otherwise imperceptible horizon as it touches and merges into clouds—and which does not catch those transient beauties which frequently flit over the face of nature like smiles o'er the features of a beautiful damsel. When a dry process can accomplish this we will not be unmindful of its claims; but with anything short of this Mr. Wilson has taught us to be dissatisfied.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

GALLIC ACID.

Synonymes.—*Ger.* Gallussaure, *Fr.* Acide Gallique.

Composition.—C_{14} H_6 O_{10}.

Equivalent.—170.

Preparations.—There are few families of plants to which we are more indebted for useful products than the one classified by botanists under the generic name of *quercus*, for among its members we have *quercus robur*, yielding us "heart of oak" for our ships, and the bark of the same tree wherewith to tan our hides; *quercus suber*, whose soft and pliant bark we convert into corks; and, for the advantage of photographers, we have the *quercus infectoria*, a plant whose branches and shoots being wounded by the puncture of an insect (*cynips gallæ tinctoriæ*, a species of wasp, seeking a place of deposit for its eggs), swell up into nut-like excrescences. These excrescences, known in commerce under the names of gall-nuts, and Aleppo galls, contain large quantities of tannic acid or tannin, which, by oxidation under suitable treatment, is converted into gallic acid. Among the numerous processes which may be adopted for the production of this acid, the following is selected, as being the simplest and most easy of accomplishment. The writer would not, however, omit to mention in this place that this is another of the photographic chemicals which it will be found more advantageous to purchase than to make: the subjoined details of preparation, therefore, will be found especially useful to those who are "beyond the reach of chemists' shops."

From the somewhat conflicting statements of the eminent chemists who have written on this subject, it would seem that the average yield of gallic acid from a known weight of gall-nuts is about thirty-five per cent.; and, bearing this fact in mind, any convenient quantity of powdered galls may be taken, and being made into a paste, with water, set aside in a shallow open pan for some weeks, with full contact of air, the temperature being kept up to between 70° and 80° Fahrenheit, and loss by evaporation supplied by the occasional addition of more water, the pasty mass will be found to swell and become mouldy, and as often as this occurs it should be turned over with a stick so as to expose a fresh surface to atmospheric influence. When the oxidation is considered complete, which will be at the end of three weeks or a month, the thick dark-coloured paste is strongly pressed, in order to squeeze out a quantity of highly-coloured liquid, and the remaining comparatively dry cake is then boiled in water, and the solution filtered while hot. On cooling, crystals of gallic acid are deposited: these, which are somewhat impure for photographic use, may be purified by boiling with fresh water, and a little animal charcoal. The filtered solution from this second treatment deposits the gallic acid in the form of slender, nearly white, silky needles, which, on careful examination, are found to be prisms, belonging to the doubly oblique prismatic system. These should be drained from

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their mother-liquor and dried between folds of white blotting-paper, and preserved in stoppered bottles for use. Gallic acid thus prepared is the result of the decomposition and oxidation of the tannic acid, which, existing ready formed in the gall-nuts, is regarded as a peculiar compound of gallic acid and grape sugar, which compound, being placed in circumstances favourable to fermentation, results in the liberation, so to speak, of gallic acid, possessing the following

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Uses.—Gallic acid was originally employed as a developing agent in the calotype and waxed-paper processes. It has more recently been used for the same purpose in the collodio-albumen process, and has even been recommended, mixed with acetate of lead, as a developer in the wet collodion process: in the latter case it is of course essential that free acetic acid should be present, to keep the gallate of lead in solution. Gallic acid must be classed among feeble developers as compared with protosulphate of iron and pyrogallic acid, and is especially applicable in those cases where, from under-exposure or insufficient illumination of the subject, there is a probability that a rapid development by a more powerful agent would give a disproportional intensity to the high lights, before the detail in the deep shadows has been fully brought out. In such cases it is found that the gradual (and if the expression may be allowed) *searching* action of a moderate developer, like gallic acid, may be much more advantageously brought into operation.

Impurities and Tests.—Gallic acid is a substance which is found in commerce in a very tolerable state of purity, its principal contamination being colouring matter of an organic nature, the last traces of which it is very difficult to separate in the manufacture. It may contain traces of iron, acquired possibly by the deposition of ferruginous dust in drying: this would be indicated by its possessing a black*ish* colour. Though it is not very probable, traces of tannin, *i.e.* tannic acid, may sometimes exist ingallic acid: evidence of its presence may be obtained by the addition of a solution of gelatine to a solution of the suspected acid, when, if tannin be present, a curdy gelatinous precipitate will be produced, whereas pure gallic acid does not precipitate gelatine.

Effect of Internal Use.—Gallic acid is a powerful astringent, and as such would doubtless produce violent constipation.

Antidote.—In the administration of an antidote for this body it would be desirable to counteract the effect already produced, and prevent the further action of what may still be contained in the stomach. For this purpose a mixture of sulphate of magnesia and calcined magnesia suggests itself,—gallate of magnesia being insoluble and sulphate of magnesia a purgative.

CABINET PICTURES.

In our report of the November meeting of The Photographic Society (London) we mentioned a display of some finely-executed photographic landscapes, by Mr. Vernon Heath, of the firm of Murray and Heath, of Piccadilly, London, which were upon the table. Beyond noticing that they were of high excellence we had no opportunity for more minute description; but we have since been favoured with some specimens for critical examination, and want of space alone has compelled our having hitherto delayed our reporting on the pictures. We cannot forbear observing, with pleasure, the very rapid strides made by Mr. Heath in obtaining the rank of a first-class operator. Only the other day he first appeared upon the scene as an amateur, and now we see him in the front rank of our most noted professionals.

The two specimens now before us command our willing admiration both for their artistic and manipulative skill. In one the central object is the lock of a canal, and upon the bridge of the lock gates stands a lady, while a gentleman is leaning against the lever by which the gates are opened. Behind is a small permanent bridge for carriage traffic, and trees shut in the horizon. On the left bank of the canal is a cottage, overshadowed by a fine sycamore tree in full leaf, and otherwise adorned with creepers, shrubs, and flowers in pots—a very perfect reflection of the whole being visible in the still water. We have very rarely seen foliage so finely rendered, photographically, as in these pictures; for, not only is the gradation of half-tone perfect throughout the entire subject, but the trees are not disfigured by that dark, sombre tone so frequently observable, but assume their correct, or nearly their correct, value in *chiaroscuro.* There is a little stiffness in the figures and a deficiency of sky effects that would, if rendered, have materially improved what is, notwithing, a very charming picture.

The companion picture appears to have been taken from the other side of the bridge mentioned in the preceding paragraph, and consists of a pleasant residence situated on the banks of a fine piece of water, upon which a boat is floating, with several occupants seated therein—the whole being set in a back-ground of fine trees, including chestuuts, firs, laurels, sycamore, and a graceful weeping willow.

The size of both pictures is about ten inches by eight. Mr. Heath is a worthy exponent of English landscape scenery.

ON A NEW PROCESS FOR PHOTOGRAPHIC PRINTING.*

By Emerson J. Reynolds,

Assistant Chemist to the Chemical Society of Dublin.

In the commencement of the present year accident led me to the study of the composition and properties of the oxalates of iron. In the course of my experiments I observed the peculiar power which light exerted on them, namely, that of reducing the oxalate of the peroxide of iron to the state of protoxalate. On this property, possessed by these compounds, I have based the process for photographic printing which I propose to have the honour of bringing before you this evening. Before entering on the description of the process itself you will allow me to speak briefly of the mode of preparation of some of the leading characters of two oxalates of iron—the proto and per-oxalate. In this way I hope to render what will follow more intelligible to you.

For our present purpose, then, it will be sufficient for me to say that two oxalates of iron exist which are convertible one into the other under certain conditions. The oxalate of the peroxide may be prepared by dissolving hydrated peroxide of iron in a solution of oxalic acid. When excess of acid is present a very soluble salt is formed, the solution of which has a sweet taste, and, when exposed to the action of the solar rays, is decomposed into carbonic acid gas which flies off, protoxolate of iron being simultaneously deposited in the form of a yellow powder. This yellow oxalate appears to be identical with the salt produced by adding oxalate of ammonia to a solution of proto-sulphate of iron. Now, let me direct your attention to the fact that the peroxalate of iron is very soluble, while the protoxalate is insoluble, or nearly so. To apply this principle to the purpose of printing by light, all that requires to be done is to saturate paper in the ordinary way with a solution of peroxalate of iron, to dry it in the dark, and expose it under a negative photograph. When sufficiently exposed, it may be removed from the printing-frame, and on being examined will be found to have acquired a *dark* colour wherever the light has acted, that is, in the shades and semitones of the picture. It may be remembered, as I stated before, that the colour of the protoxalate of iron, which is the result of the action of light, was yellow. Then it may be asked, how is it that this deposit is of a dark colour? The answer to this is very simple. Protoxalate of iron when formed under the influence of light, without the presence of moisture, is deposited in the anhydrous state. When in this condition it has a dark colour, but the moment it is brought into contact with water the light yellow hydrated

* Read before the Dublin Chemical Society, November 24th, 1861.

salt is produced. It is precisely the same with a picture, for the moment it is immersed in the water the dark outlines disappear, and, instead, there is a yellow impression observed. So far, however, the picture is almost invisible, consequently some means must be had recourse to in order to develop it. There are several ways in which this object can be accomplished: perhaps the simplest is by the use of the red prussiate of potash or ferricyanide of potassium. When the picture is immersed in a solution of this salt, the parts exposed first become green and then blue: of course the deposit is Prussian blue. Although this reaction was useful, in the first instance, for the purpose of showing me how far the actinic action had gone, yet it is evident that the colour produced would not do for the production of regular pictures. Hence I was obliged to find some other developer by means of which a grey or black photograph could be obtained. After some search I found a developer which accomplished everything I wanted, and this was ammonio-nitrate of silver. By treating the print with a solution of this salt I get a deposit containing metallic silver in a finely divided state, which being black gives the picture its proper intensity of tone. All that now remains to be done is to wash well, dry, and mount, when the picture is finished.

I have now given, step by step, the various means by which I have worked ont the process. There are some modifications which I have since introduced that I will now proceed to notice.

I frequently observed that the prints produced by the process I have just described were wanting in the beautiful accuracy of detail observable in pictures printed by the chloride of silver process. I immediately set to work in order to find out the reason of this, and at last came to a correct conclusion as to the cause of failure. I found that a solution of the peroxalate of iron was capable of dissolving a very considerable quantity of the protoxalate. Here lay the solution of the difficulty. The explanation was just this:—When the print is immersed in water, after coming out of the printing-frame, the peroxalate is dissolved, which, in turn, attacks the finer and more minute deposits of protoxalate, dissolving them before it gets too much diluted to exert its solvent power. The question now arose as to the best measures to be taken in order to prevent the details from being lost in such a manner. After a great number of experiments, I found that the difficulty might be overcome in either of two ways—one being to substitute the combination of peroxalate of iron with oxalate of ammonia for the plain peroxalate, this compound salt not having any action on the protoxalate. The second way was to wash the print immediately on coming out of the printing-frame with a solution of acid oxalate of ammonia, which immediately formed the double salt referred to. By either means the desired end may be accomplished, and pictures obtained with their full amount of detail. It is almost needless for me to add that the picture can readily be toned with gold by means of the alkaline gold toning bath generally in use amongst photographers. There now remains some questions to which I wish to draw your attention. In the first place, a query which naturally suggests itself is—Whether prints can be produced as rapidly by this process as by the old one? I can easily give an affirmative answer to this question, for I have repeatedly taken prints from a negative on a fine day with as short an exposure as if I were employing a sensitive surface of chloride of silver. I have compared the relative action of the solar spectrum on paper prepared with a solution of peroxalate of iron, and with the usual sensitive surface of chloride of silver, and I find that the oxalate is acted on from the green up to a considerable extent beyond the visible violet rays—in this respect somewhat resembling chloride of silver.

Now, from what I have said, you will see that my process possesses two great advantages over the ordinary one—in being both very cheap and the prints produced by its aid requiring a very slight amount of washing. This same operation of washing has been the bane of photographers ever since the art was discovered. We may form some idea of the trouble incurred in producing, or endeavouring to produce, a stable picture, when an eminent writer on the subject states that no picture can be considered at all safe unless it has undergone at least eight or ten hours' continuous washing with running water. I think no one will deny that my process contrasts very favourably with this, when I state that a picture, by its means, can be printed, developed, washed, dried, and mounted—all within two hours, on a fine summer's day. So far as their permanency is concerned, I can only say that I have exposed a picture during a period of three months, on every opportunity, to direct sunshine, and up to the present time I have not observed any indication of fading. I may remark that the cost of the production of a hundred pictures by my process is something ridiculously small when compared with the considerable outlay incurred in printing the same number of pictures in the ordinary way.

In conclusion, I may say that I trust photographers will try this process for themselves, and ascertain whether it is worth following or not. It must be remembered, however, that it is as yet in a very imperfect state; but I hope, in the course of the ensuing spring and summer, to be enabled to continue my experiments in this direction, and if it is not found to be capable of practical application, at least it affords a curious instance of the use to which the knowledge of an apparently abstract scientific truth may be applied.

Exhibition.

SIXTH ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

This Exhibition, now open in the same place in which it has been held for some years past—George Street, Edinburgh—presents no contrast to that of last year, unless it may be in the great accumulation of *cartes de visite* portraits, of which, as might have been anticipated, some are miserable in the extreme, some possess average merit, and some few would satisfy all the requirements of the most fastidious taste.

Although the catalogue shows that there are 85 artists exhibiting, some of these are not exhibitors in the usual sense. Wilson, of Aberdeen, for example, sends none for exhibition himself, although a considerable number of his little *souvenirs* are contributed by a printseller in this city. Some might be apt to question the propriety of sending to a photographic exhibition works which for some time have been articles of commerce, and as such available for inspection at the various shop windows; but a glance around the room shows that were an expulsion to be made on such grounds the number of pictures in this Exhibition would be sadly reduced, for several "old familiar faces" and places, whose acquaintance we have long ago made in the show-cases at the stair foot of the professional photographer, now kindly smile upon us from the walls of this Exhibition. This peculiarity is very noticeable indeed.

The varieties of process employed in the production of the pictures are few—indeed year after year they are getting fewer and fewer. How much this depends upon the system which this Society adopts, of giving medals for the pictures which they consider best, is a matter of opinion. A recent article on this subject in The British Journal of Photography, by Mr. John Cramb, of Glasgow, is felt by many in this city to be at least one of the best and most suggestive articles that has yet appeared. It is evident that awarding medals for merely pretty and artistic prints is not the best method of advancing the interests of photography as a science. Mr. Cramb or some one else might suggest the best means for attaining this *desideratum*. This leads us to state that among the various contributions to this Exhibition we look in vain for Joubert's patent enamel transparencies; photographs in carbon or any other pigment; specimens of Ramage's or any other person's photolithographs; photographic engraving by any of the existing processes, whether photoglyphs or photogalvanographs. There are no magic lantern slides, nor are there any of those huge productions for which our Gallic brethren are celebrated (let us except a painted portrait on a solar camera production as a base); in short, we were about to add that there was nothing whatever new or uncommon in the Exhibition, when our attention was directed to some panoramic pictures alleged to be taken by a patent lens, "which includes an angle of 100°, or two-thirds more than an ordinary lens will include." This we learn from a printed slip pasted on the pictures. An inspection of these (views in Jersey, Nos. 501-2-3-4) satisfies us that if these pictures are sent as specimens of the performance of the panoramic lens a very great blunder has been committed, for the want of definition is very great indeed. The ferns and other objects in the foregrounds require the exercise of no small amount of imagination to enable them to be "deciphered," and the pictures generally are hazy and indistinct, forming in this respect a marked contrast to almost all the other pictures in the Exhibition; and we would say, without hesitation, that if these are the best pictures that can be produced by the panoramic lens, photographers will do well to stick to their meniscus and Petzval lenses for some time yet. Mr. Mudd, too, has entered the field with, a panoramic picture—*Eskdale, from Birker Fell* (324). This is a brilliant, magnificent picture, evidently printed from two negatives

although on one sheet of paper. As soon as Mr. Mudd chooses to divulge the manner in which he manipulates such pictures, we doubt not that he will be favoured somewhat extensively by that truest flattery, *imitation*—a consummation devoutly to be wished.

Among the non-resident contributors to this Exhibition are Annan, Claudet, Vernon Heath, Hering, Abbot, Kirkland, S. Thompson, Bedford, Lyte, Mudd, Piper, Rodger, Robinson, and others. Most of the pictures are by the collodion process—some few being by modifications of it, such as collodio-albumen, tannin, malt, and "hot water."

The Rev. D. T. K. Drummond practises chiefly the malt process. His pictures exhibit considerable artistic judgment in the selection of points of view; and it only remains for him to adopt a process such as that used by Mudd or Annan, by means of which he can get better gradation of tone, and also to employ a smaller stop in his lens than he appears to have done in some of his works, to enable him to rise to a higher position than he otherwise would attain.

We are inclined to characterise *Loch Ranza, Arran* (101), by T. Annan, as the best landscape in the Exhibition. It is a pleasing picture: the composition is good, and the manipulation perfect. This picture is by the tannin process. The same artist also shows some others, all possessing great excellence.

The collodio-albumen process still has its champion in Mr. Mudd, who exhibits eighteen pictures, which are all worthy of that artist. We have previously alluded to his panoramic picture as one of great merit; we doubt not that were it not for *Loch Ranza*, alluded to above, this picture would have to be pronounced as second to none in the Exhibition.

Vernon Heath's pictures are worthy of admiration on account of their clearness and general excellence. His shadows are not of that inky blackness which pervades many pictures, and the selection of subjects is made with the eye of a master. *Old Mill on the Almond* (492) we think is his best, although many of his other contributions, especially *Turnpike, Glenalmond*, and *Bridge on the Earn* (335-6-7), are perfect gems, and will not fail to attract attention.

W. Kirkland exhibits eight large-sized pictures taken by various processes. A tannin picture, *Holyrood Chapel* (590), is one of his best, and is a noble work, combining breadth and brilliancy—the point of view he has selected showing the value of an artist's eye. In this respect the picture, *Cedar at Biel House* (586), by D. Campbell, which hangs next to it, forms a strong contrast, being what artists would call a *front elevation* of a tree, quite sectional in effect. It is only fair to state that the photographic merits of this picture considerably predominate over the artistic.

We can scarcely congratulate Mr. Ions on the merits of his picture of *Ruins, Dunfermline Monastery* (580), which gives the spectator the idea that it was taken not by midday, but by the feeble light of a waning moon. It presents a contrast with its neighbour on the left, *Brislington Church* (576), by Thomas Tyley, which is brilliant and sunny, although by no means picturesque.

Mr. H. P. Robinson exhibits four pictures, among which is his famous picture, *The Lady of Shalott*, on which (as it has been so recently and specially noticed in these pages) we add no comment beyond the remark that it is free from the "clipped out" appearance which his *Holiday in the Woods* of last year possessed to a certain extent. One of his minor pictures, *Early Spring* (605), a study by the river side, is a pleasing photograph, with excellent distance.

Mr. Maxwell Lyte contributes fifteen pictures. There is a grandeur and massiveness about his productions which stamp him as a true artist, although his shadows, in many instances, are unnaturally black. This failing, however, characterised his pictures of last year to a much greater extent than the present; and, when this defect shall have been totally overcome, few indeed will successfully compete with him. His subjects are chiefly mountain scenery and glens in the South of France.

The past inclement season, together with the volunteer movement, may, perhaps, have prevented such valuable contributors as Mr. Horatio Ross, Mr. Fenton, and others, from enriching the collection; but we are glad to see some new names in the catalogue, and among others that of S. Thompson, who exhibits twenty-three pictures, mostly architectural subjects, no fewer than nine of which are views of *Melrose Abbey* from various points. These would form a collection of great value to the archæologist. The points of view preferred by Mr. Thompson, as well as his manner of treatment, evidently indicate that he possesses true artistic feeling. We would recommend him to try his hand at general landscapes, in which department of the art he would evidently be as much at home as among architectural subjects.

Mr. Dixon Piper's pictures, of which there are ten or eleven, indicate perfect photographic manipulation, without, however, corresponding taste in the arrangement of subjects.

Only one picture in the Exhibition purports to be by the hot water process, viz., *On the Water of Leith* (390), by J. Nicol—in which the gradation of tone and general merits of the picture are excellent.

There are several pictures by the waxed-paper process. Herries, as usual, shows in great force. His pictures are uniformly good and are, without doubt, the best exhibited by this process. Mr. Adam, also, exhibits several. We cannot see what there is in the picture marked 585 that could induce Mr. T. B. Johnstone to waste an evidently successfully-prepared negative sheet on a subject so totally devoid of interest. Surely this artist could have picked up in the environs of his native city a hundred specimens the worst of which would be more interesting than his *Mill on the Allan*. However, many people think that "far awa' birds hae bonniest feathers."

We cannot conclude the present brief notice of the landscapes without adverting to a beautiful little "bit" by Annan, *The last Stooks of Harvest* (62), in which the few sheaves tell of the forthcoming harvest-home. A little brawling brook, rather suggested than pourtrayed—a rocky precipice, almost hidden by coppice-wood—last, though not least, a beautiful sky—will cause the visitors to make the acquaintance of this (as a whole) picturesque photograph, which we observe by the catalogue is taken by the tannin process.

AUR. CHL.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

A Passing Glance at Harmony of Proportion — Tone — Why and How Colour is Suggested by Tone—Tone as an Element in Expression—Black and White in Connexion with Tone—Claude's Sunlight and Turner's Scale of Tones.

"All theories admit proportion to be an essential constituent of beauty."—*H. Howard, R.A.*

"The true excellence of ancient buildings I take to be a close study of *natural laws* in their proportions."—*Mr. Blashill.*

"Every hue and every shade has its corresponding shade of expression and reciprocation, affording materials for the cultivation of feeling and taste—the sublimest expression vibrating in all cases to the most delicate touch. * * By tone and colouring the artist is able to aid and excite the ruling and subordinate sentiments of his performance in the manner of the musician."—*G. Field.*

"The subtler or more spiritual art of the painter, like that of the poet, resides in his power of exciting or awakening congenial trains of ideas in the minds of the contemplative, tasteful, or susceptible, and not, as is frequently and vulgarly supposed, in merely addressing the optical sense, and imprisoning the fancy with what is before the eye; and these trains of ideas will vary, as the minds addressed are more or less cultivated or informed, or are lively, apprehensive, or dull."—*T. Landseer.*

My Dear Fellow-Student,

Before quitting the subject of harmony let us take a farewell passing glance at it once more in connexion with *proportion*.

Proportions properly selected and combined are in each of the fine arts a source of harmony. The musician seeks it in the studious sub-divisions of his musical scale; the architect seeks it in his selection of such proportions as accord harmoniously in the finished whole; the sculptor takes the measurements of the most famous Greek statues to form his canon of proportions as productive of harmony; and the painter portions out the warm and cold, dark and light, colours with an eye to this same result. In our photographic pictures proportions are of course more or less influenced by perspective, and it is also a matter over which we have less control than those have who follow more purely creative arts. But as a love of the beautiful should find a home in the breast of every true artist, you cannot wisely omit studying proportion. Here, however, I shall pretend to give you nothing beyond a few stray hints, in order that we may pass on to matters of more practical value to us as photographers.

Pamphillus taught of old that no painter could excel without a knowledge of mathematics—thus urging, as is generally supposed, the study of proportion. Vitruvius asserted that the proportions of the human figure in its perfection should regulate the selection of quantities in architecture, no proportions being so harmoniously beautiful as these were. The Greeks had certain statues which were held as canonical in their proportions. Howard, when President of the Royal Academy, said —"Unless on the supposition that it contains in itself some inherent but unexplained charm, I know not how to account for the satisfaction afforded us by the propor-

tions of some architectural mouldings and compartments in preference to others where no mental associations can be readily shown to exist. It is connected with the science of numbers, and is, perhaps, the principle of harmony itself." Flaxman, in his Royal Academy lectures, following Pamphillus, asserts that "it is impossible to see the numerous figures springing, jumping, dancing, and falling in the Herculaneum paintings, the painted vases, and on the antique *bassi-relievi* without being assured that the painters and sculptors must have employed geometrical figures to determine the degree of curvature in the body, and angular and rectilinear extent of the limbs, and to fix the centre of gravity." But whatever our opinion on this subject may be, its importance is too widely and too generally admitted to permit a doubt of its value as an element of harmonious beauty.

By way of practical illustration, it is said that when we associate height and breadth to secure harmonious effect the breadth should not exceed the height less than twice nor more than five times; that when we associate unequal quantities we should govern the fractions by dividing and sub-dividing by the number three, as in the case of any building upon the plan of a Greek temple, in which the entablature, colonnade, and steps are the three chief portions, and which are in their turn divided into three unequal parts, as in the three bands of the architrave and cornice, and in the shaft, capital, and base of the columns, &c., &c. In the human body, and indeed throughout all nature, it is said, we find the mysterious three which nearly always govern the parts of harmonious and beautiful objects. I do not pretend to explain these things, for my betters have failed in doing so, but simply leave them for your more careful consideration. I have jotted down the few hints above, and strengthened them with two or three quotations and references, and you may now pursue the theme or leave it alone at your own sweet will and pleasure. But beware of avoiding *all* theory; and consider that, if a little mental labour acts by strengthening or educating the eye and mind to a better appreciation of higher qualities, it does us good *practical* service. Though we can only *see* the surface of the moving river, we know it is its unseen depths which give it strength to reach the ocean goal.

The next subject to which we will devote our studies shall, with your permission, be one to which I have several times referred during my progress through my preceding letters, viz., that of TONE.

Ruskin says:—"I understand two things by the word 'tone.' First, the exact relief and relations of objects against and to each other in substance and darkness as they are nearer and more distant, and the perfect relation of the shades of all of them to the chief light of the picture, whether that be sky, water, or anything else. Secondly, the exact relation of the colour of the shadows to the colours of the lights, so that they may be at once felt to be merely different degrees of the same light; and the accurate relation among the illuminated parts themselves, with respect to the degree in which they are influenced by the colour of the light itself, so that the whole picture may be felt to be in one climate, under one light, and in one kind of atmosphere."

Now, under the head of "Subordination," I have already pointed out how tone should express distance, atmosphere, &c., and under the head of "Harmony" I have shown how the depth of the shades must be in accordance with the intensity of the lights—thus disposing of one of Ruskin's two things.

But with regard to the question of colour as part of the second thing I have something to say.

The painter, in making choice of colours, always considers, or always should consider, the general character and colour of the light by which the objects he depicts are illuminated. A morning scene should have its own pale yellow light apparent as influencing all the colours in regard to their purity, and so with an evening or mid-day scene. Should the light be pure the colours are more *varied* and brilliant, while should it be golden, or orange, or red, they acquire a greater or lesser degree of sameness. The effect, in short, is just such as you would obtain in viewing colours through stained glass, as opposed to that you would get by viewing them through white glass. But these colours have their *tones* as well as their distinctive hues and tints, and with these tones they are always *instinctively* associated. Thus yellow and orange are called luminous, and blue and purple are associated with shade, while green and red fill up the intermediate space. Both philosopher and painter will agree in thus defining colours.

The application of the rule we thus obtain must now, I think, be apparent. When our photographs have their greatest variety of tones (do not, for goodness sake, fancy I mean the tones of the toning bath), the effect is more nearly analogous to that of daylight, and such light seems more or less brilliant according to the relationship of such tones to the more or less luminous ends of our scale. But when the tones are less in number, the effect approximates more nearly to that of some coloured light; and this light appears associated with that colour which is more or less connected with shade, according to the character of the tones, *as a whole*, in connexion with one or the other end of the scale aforesaid. Thus one scale of tones may suggest a white light, another yellow, another orange, another red, and another purple. The power of expression thus gained cannot be too highly estimated. Suppose your view represents the misty haze and dewy freshness of early morning: is it no addition to its feeling and power of expression when the scale of tones secured by the careful chemical and manipulatory treatment of your negative suggests also the glow of the rising sun flooding the landscape with its molten gold? Or, should the view chosen indicate the lengthening shadows and more mellow radiance of the waning day, would it gain nothing if the harmonising colour of the purplish-rosy light was indicated—however remotely—in the subdued high lights and deeper shades of the whole? These are things which the painter thinks about deeply and earnestly: is there any reason why they should be sealed studies to the photographer? I certainly find, in the productions of my professional and amateur fellow-students of photographic art, various scales of tones; but, as I intimated in my previous letter, they rarely have more than one peculiar to themselves. A sunrise and a sunset have the same scale; and a view taken under the unclouded mid-day sun has no other. All this is obviously very false to nature and very untrue to art; yet I ask you honestly—is it uncommon to photography?

To proceed to another part of this subject. The amount of pure black and white in a picture should be very, *very* small. Large masses of white or black are equally destructive of tone, and very little is most valuable to it.

Referring again to Ruskin's work,* we find him saying:—"Not only does Nature surpass us in the power of obtaining light as much as the sun surpasses white paper, but she also surpasses us in the power of shade. Her deepest shadows are void spaces, in which no light whatever is reflected to the eye; ours are black surfaces, from which—paint [or *print*] as black as we may—a great deal of light is still reflected; and which, placed against one of nature's bits of gloom, would tell as distinct *light*. Here we are, then, with white paper for our highest light, and visible illuminated surface for our deepest shadow, set to run the gauntlet against Nature, with the sun for her light and vacuity for her gloom.

Bearing the above in mind go you, my dear Fellow-Student, to one of the great Claude's paintings, in which a little round patch of oil-stained, time-discoloured, once white paint is so dazzlingly brilliant that the landscape appears flooded with its wondrous radiance, and we seem almost to feel its fervid glow. Is that circular dab of paint at all like THE SUN? Or is it not rather like one of the most absurdly feeble of conventional hieroglyphs? And yet how perfect is the deception! Ah! that has nothing to do with the colour-box, that sunlight of Claude's. It is the light of his artist mind in which we yet bask so pleasantly: it is, in other words, the power of *tone* which gives this brilliancy to dingy paint and discoloured varnish—nothing else. If you want yet other illustrations go to the Turner collections, and when you come away remember how much your white paper is purer than Claude's white paint, and how seldom Turner's scale of tones embraces the two extremes of black and white in any one of his magnificent productions.

And now I consign you to the festive pleasures of this jolly season, and turn myself from the art of making pictures to that of making preparations for what I heartily hope you will gratefully enjoy for many hopeful years to come, viz.—"*A merry Christmas.*"

Yours truly, ALFRED H. WALL.

PORTABLE FINISHING CALENDER.—The large accession to photographic business, consequent upon the *carteomania*, has rendered a rolling press almost indispensable to every photographer. Hitherto the high price has been a bar to their general adoption. Messrs. Bury Brothers, of New Cannon Street, Manchester, have recently introduced a very neat machine for the purpose. The plan is excellent; but the one we have seen was not so nicely finished as is absolutely necessary for working correctly, and the handle is so short that to roll a number of prints becomes hard work. We would also suggest the use of a brass instead of a steel plate, as equally efficient, and not so likely to get out of order. We offer these as suggestions, which, when acted upon, Messrs. Bury Brothers will have conferred an immense benefit on all photographers who have a large amount of rolling to do.

* *Modern Painters.*

Notes of the Month.

THE curtain has fallen on another year—say, rather, a funereal pall, of which the bearers are countless. The empire of mind has lost a true king; and science and art has sustained an irreparable injury in the loss of one whose sun has gone down while it is yet day. The event is all too recent—a mournful light still broods above the fallen luminary like the after-glow in the golden west—to estimate the full extent of that loss. We know not—nor perhaps shall ever know—what we lose in one whose influence was immense, and that influence always exercised on the right side. The late Prince Consort was decidedly in advance in seeing the incalculable value and the refining social importance of art-teaching. Photography loses much in losing the direct countenance and support it received by his steady and intense interest in it. It spoke much for it when a man of his large views would devote so much time to its details. His visits to our Exhibitions were never cursory ones, nor those of the mere *dilettanti*. May we never, in the unknown future, have occasion to exclaim—

"O for the touch of a vanish'd hand,
And the sound of a voice that is still!"

The sculptors have their "little grievance" as well as others, and are labouring under some anxiety as to the allotment of space which will be made to them in the forthcoming Exhibition. According to the present decision of the Commissioners no applications will be entertained on behalf of works which are not so far complete that their merits, as well as the space to be occupied, can be exactly estimated. Some discretionary power seems desirable, especially in reference to sculptors of acknowledged position and reliable capabilities. The last day for sending in works of sculpture is fixed for the 31st of March.

One notable feature of the present season is the number of books illustrated by photography. Amongst them we enumerate *Photographs of English and Native Life in India*, published by Messrs. Lovell Reeve and Co.; *One Hundred Photographs of Egypt, Nubia, and Ethiopia*, by Francis Frith, with letterpress by Mr. Joseph Bonomi and Mr. Samuel Sharpe, published by Messrs. Smith, Elder, and Co.; *The Ruined Abbeys of Great Britain*, illustrated by Fenton, Bedford, Sedgfield, and Wilson, with descriptive matter by William and Mary Howitt, published by A. W. Bennett.

A magnificent work, in illustration of the great Picture Gallery at Antwerp, is now in course of publication at Brussels. The first *livraison* contains *The Nativity*, by Josse de Gand, one of the early Flemish masters; and the *Vierge au Penoquet*, by Rubens, the greatest master of the same school. From the inherent difficulties in copying paintings, the copy of the first-named is far more pleasing than that from the greater master, Rubens. This, though a pity so far as it concerns Rubens in a photographic point of view, holds out a prospect of some very beautiful results with the Van Eycks, the Van der Weydens, and the Hans Memlings, in the Antwerp Museum. A new work on the Art Treasures of Russia, to be illustrated by photographs, has been commenced at *Paris*, under the auspices of the Emperor Alexander.

The *Athenæum* advocates an extension of the series of photographs from Turner's *Liber Studiorum*, published by Messrs. Cundall and Downes, of New Bond Street, London, so as to embrace the whole number of seventy-one drawings made by the artist towards the one hundred of his original intention. Many more of these works are in possession of the Trustees of the National Gallery than those already reproduced from the series at South Kensington. There can be no reasons urged against the extension suggested, and renewed examination of those already published confirms the belief that these marvellous works of Turner's cannot be too widely disseminated.

A recent number of the official journal at Rome contains an edict from the Cardinal Vicar announcing that no one will be allowed to exercise the art of photography without authorisation from the Rev. Master of the Sacred Palace, from the Cardinal Vicar, and from the police, under penalty of fifty dollars fine. Amateur photographers are liable to the same. The clandestine publication of some very scandalous photographic representations, in which the heads of the Pope, the Queen of Naples, Cardinal Antonelli, and other persons of high rank were placed on the bodies of other individuals in such a skilful manner as to deceive any spectator, has called forth this stringent measure. Provision has also been made for the punishment of offenders of this kind, and the author of the above publications has been captured, and incarcerated in one of the Papal prisons. S. T.

Entremets.

IT is scarcely necessary to observe that the French term above used is one applied to small dishes filling up the spaces between the more important ones at a feast: we have therefore chosen it to head such readable articles as, while fairly belonging to matters photographical, are yet of a light and amusing kind.

Seneca tells us that "uninterrupted labour deadens the soul." Even the sternly earnest Jesuits ruled that every two hours of study should always be followed by relaxation; and we do not think that, when the deeply-learned and scientific student sits gravely down to our more important dishes, he will object to do so because the spaces between them are filled with smaller ones.

Our readers are numerous: we well know their tastes are varied; and it is our duty to cater not for this or that particular section of their number, but for all. Some like this, some that; and the article which may be disregarded by one is likely to be sought by another.

In lines remarkable alike for their philosophical spirit and the simple eloquence of their unaffected truthfulness, a poet of the people, whose vocation never permitted him to lose sight of the sad but common fate of all his hapless race, and whose name is one we might all aspire to claim—in short, a dustman—once wrote as follows:—

"Diff'rent people, diff'rent 'pinions;
Some likes happles, some likes inguns!"—

acknowledging the force of which, we hope in this our new dish something may be discovered for every taste. Within its scope will be found, from time to time, a goodly variety of the lighter kind of viands. Choice scraps gathered in our rambles through the dominions of our different contemporaries; biographical sketches from the lives of those whose discoveries or researches aided the birth of our beloved art; epistolary contributions from such amusing friends as the "littery" Mrs. Spriggins, or that famous inventor of key-hole photography, Paul Pry, and other equally amusing contributors. With these we shall blend random records of photographic adventure—tit-bits from new books—and, to be brief, any such wholesome scraps as may deserve the welcome of our guests, without pretending to vie in importance of either interest or subject with such as are more elaborately prepared.

We shall now introduce our new dish for the new year with a new sketch from a new contributor, trusting that, while acceptable in our present issue, it will, in combination with its successors, prove an attractive feature of our present volume.

IN SEARCH OF AN OPERATOR.

SITTING without candlelight, some few evenings since, by my study fireside, in the deepening gloom of a closing day, I was thinking in a dreamy, listless, indefinite way about all kinds of things and all sorts of people, when gradually from this chaos of moving shadows came forth a more tangible series of ideas about my present profession. I am a photographer, chiefly occupied in portraiture, having a large private establishment—well, say, not a hundred miles from the City of London—and employing several operators and printers.

I was thinking, on the evening in question, then, about my new profession, and of the odd mixture of individuals forming its component parts. Miniature and portrait painters whose occupation, like that of *Othello*, had gone—actors whose bright dreams of histrionic fame had long since ended in their awakening at last, and, as it seemed, too late, to the bitter consciousness of a mistaken vocation—toilers in the lower and worst-paid walks of literature—gentlemen who have come down in the social scale only to be more proud of their losses than they ever were of their gains—imprudent ones, whose wealth, having melted like ice beneath their dainty feet, has left them struggling alone in the cold dark waters of adversity—mechanics, with souls above their position, making earnest and aspiring efforts to reach the higher level; and mechanics with souls beneath their position, clutching at any chance which may appear to promise a life of indolence, and through which they sink to that lower level they are better fitted to disgrace—chemists' shopmen, escaping from the monotonous drudgery of life behind the counter—speculative individuals, who try everything, and, as they say, "*mysteriously enough*" fail in each:—from these and from every other source, downwards through all the various classifications of individuals, trades, professions, and callings—even to those gentlemen whose other vocations are best known to the detective police—does photography gather its recruits. Truly we are a motley race, take us for all in all! and some of us might form a

regiment worthy of jolly Falstaff's own! But of all these give me the class I have not yet named—that which is formed by men whose unselfish love of the art first made them amateurs, and whose success as amateurs first made them professional. These are the labourers most worthy of their hire—the photographers who do honour to the art, by raising it into loftier appreciation, and advancing its honest claims both as a fine art and as a branch of science. But in saying so let me frankly admit that I, for my own part, joined the profession, not for love of it, but out of sheer vulgar necessity. My camera was merely taken in hand, *originally*, for providing what we artists call "pot-boilers," when that other then much dearer profession—portrait painting—had failed me in my sorest need. I did not therefore at first take kindly to the art by which my own was rendered, to me at least, very nearly valueless.

If to professional photographers we add the amateur practitioners of the art the variety becomes even greater, and may be said to exist in every phase of social life, from noblemen of the loftiest rank to the shabby half-beggar tramp who goes from door to door with his few ounces of this or that solution in his pocket, and his poor little home-made camera under his arm, offering to do glass positives of family groups in your back garden for almost any sum you may be inclined to tender him. And there is no less variety in the productions than we find in the producers; for a wider boundary line than that which divides the dirty-looking smudge of the worst from the glorious pictures of the best cannot well be imagined, although the intermediate space being filled with a countless number of steps, leading upwards or downwards as the case may be, the uninitiated are apt to overlook the immensity of the difference. Pursuing such thoughts as the above, I was led to think about my own experience as an employer, and to recall the difficulties experienced some few months since when I was "in search of an operator," an account of which, however, in consequence of the length of these my preliminary observations, I shall defer until the next number. R.A.S.

Meetings of Societies.

MEETINGS IN JANUARY.

1st.—Bradford.
2nd.—Glasgow.
3rd.—Newcastle-upon-Tyne.
7th.—London and Liverpool.
8th.—Manchester.
9th.—South London and Chorlton.
14th.—Photographic Society of Scotland and Birmingham.
15th.—Edinburgh.
22nd.—North London.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

An ordinary meeting of this Society took place on Wednesday evening, the 18th ult., at Myddleton Hall, Islington,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Francis and Mr. C. Noble were ballotted for and duly elected members of the Society.

The Secretary read an interesting paper, by Mr. Bourne, on *The Original Fothergill Process.* [See page 6.]

Mr. Bourne accompanied his paper by the gift to the Society's portfolio of some excellent landscapes taken on plates prepared by the method described by Mr. Bourne, which was, in fact, nearly identical with that originally published by Mr. Fothergill in *The Times*.

Mr. Shave, on the conclusion of the paper, said he thought that an examination of the specimens would quite satisfy any one as to the full capabilities of the Fothergill process for large plates.

Mr. Hill advocated the use of a bromo-iodised positive collodion for negatives, and development by means of iron.

The Secretary and Mr. Shave concurred in the opinion that a thin collodion was most preferable for the process under consideration.

The Chairman reminded the meeting that Mr. Hardwich had also recommended the employment of a thin collodion. In reference to Mr. Bourne's remark on the "four drachm washing," he wished to observe that Mr. Keene, of Leamington, had recommended that quantity for a stereoscopic plate, so that gentlemen were free to use a larger proportion for larger plates, and still be carrying out the same plan of limited washing in the removal or rather dilution of the free nitrate. His (the Chairman's) own experience on this head inclined him to entertain an opinion different from Mr. Bourne's, since he had successfully kept 9 × 7 plates ten months which had been washed with only four drachms of water.

Mr. Hill thought Mr. Bourne's object was to convey the impression that the *average of successes* was greater with a thorough washing.

Mr. Shave regarded the *last* washing, to remove the excess of albumen, the most important: he thought it could hardly be carried to excess.

The Chairman remarked that Mr. Bourne had directed attention to the importance of "a force of water" to wash away the albumen. He quite agreed with Mr. Bourne and Mr. Shave on that point: he thought too much water could not be used.

Mr. Bingham employed a watering-pot in that part of the process.

Mr. Hill suggested the importance of a continuous stream in pouring the albumen over the plate.

Mr. G. Wharton Simpson and the Chairman directed attention to the methods of using prepared albumen, as suggested by Mr. Hannaford and Mr. Barber, as calculated to ensure uniformity of sensibility.

Mr. Shave regretted the want of harmony among those who practised the Fothergill process as to the proportion of albumen and water.

Mr. Hill said he used one ounce of albumen to five ounces of water.

The discussion terminated with some critical remarks, by Mr. Hughes and others, on the artistic merits of the photographs presented by Mr. Bourne.

Mr. Hislop wished to offer a few observations connected with his paper, read by Mr. Martin at the last meeting of the Society. A variety of opinions were entertained as to the effect of albumen on the nitrate of silver bath, many gentlemen thinking it must inevitably impart colour as in the case of albumenised paper. He (Mr. Hislop), in answer to that opinion, begged to submit for inspection a two-ounce sample from a bath which he had in use for two years, and into which hundreds of plates had been plunged, the strength having of course been kept up by occasional additions of nitrate of silver. Gentlemen could see that the solution was quite colourless. In reference to the opinion expressed at the last meeting that the previous coating of the glass with albumen materially influenced the result, he would say that he had again adopted the plan of ocular demonstration in evidence of the soundness of his opinion to the contrary. [Mr. Hislop then exhibited two plates (transparent positives) in which the circumstances of preparation were precisely similar throughout, except that one was previously coated with albumen and the other not.] He would ask any gentleman present to say which was the albumen-coated plate. He would say, finally, that in practising the Fothergill process he had found the film of the collodion frequently split off. This untoward result was entirely prevented by previously coating the plate with albumen, and he (Mr. Hislop) contended that it served no other purpose than that of retaining the film on the plate.

The Chairman had established by direct experiment a fact which he believed completely negatived Mr. Hislop's views on this subject. He (the Chairman) had coated a plate with albumen, dried, then coated with collodion, taken his picture, and subsequently removed the whole of the collodion, and yet retained the picture intact, clearly showing that it (the picture) was on the albumen film. And in reference to the distinguishing of the two pictures submitted for inspection, he (the Chairman) must admit they were more alike than he should have anticipated; but he observed that one of the pictures possessed greater vigour than the other, and he should be inclined to say that that was the albumen-coated plate.

Mr. Hislop admitted the correctness of the Chairman's selection from the pictures, but attributed the increase of vigour to an exalted sensibility imparted by the albumen. In reply to a question from Mr. Evershed, of Brighton, Mr. Hislop stated that he *dried* his albumenised plates.

Mr. Hughes had employed albumen-coated plates in the ordinary negative collodion process with an iron developer, and must say that he was at first quite charmed with the exquisite delineation and vigour and the increased softness attainable by their use. He was, however, soon obliged to abandon a process which seemed to promise so well, on account of the fogging power imparted to the bath: the first few plates yielded results such as would satisfy the most fastidious, but as the number of plates increased the fogging increased, and he was reluctantly constrained to relinquish that method of working.

Mr. Evershed asked if Mr. Hughes dried his albumenised plates?

Mr. Hughes replied that he continued the application of heat until the plate, when viewed in one direction, seemed covered with minute cracks, which he regarded as evidence of complete dessication.

Mr. Fry asked if Mr. Hughes diluted his albumen or used it pure?

Mr. Hughes stated that his albumen was pure and undiluted.

Mr. G. Wharton Simpson said that a correspondent had sent him some pictures on glass, prepared with simply washed collodion without previous or subsequent coating, and the pictures in his (Mr. Simpson's) opinion left nothing to be desired. His correspondent stated that he added ammonia to his collodion with the view of producing a pulverulent structure in the film.

Mr. Hughes remarked that the ordinary effect of the addition of alkalies to collodion was to render it more fluid.

The Chairman had observed that the addition of a small quantity of collodion so treated to a larger quantity seemed to communicate the same character to the whole. He thought that some catalytic action was probably established.

Mr. Evershed had observed an article in The British Journal of Photography, by a French gentleman, recommending the *rubbing* of albumen over the plate previous to coating with collodion.

The Chairman thought that plan by no means so good as allowing very dilute albumen to *flow* over the plate. It was generally admitted that albumen caused the collodion film to adhere with greater tenacity to the plate.

Mr. Hislop, in reply to a question from Mr. Simpson, said that he used half a drachm of acetic acid to three ounces of albumen; and, in reply to Mr. Fry, he further stated that he did not varnish the edges of his plates.

The Chairman passed round for inspection some very excellent stereographs of Ilfracombe and North Devon, by Mr. Hill, the Treasurer of the Society. Also others in illustration of the advantage to be derived from the employment of slightly albumenised paper and subsequent waxing,

as set forth in the letter of "A Country Parson," page 452, vol. VIII., of THE BRITISH JOURNAL OF PHOTOGRAPHY.

The meeting terminated with the usual votes of thanks to Mr. Bourne and Mr. Hislop.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on Thursday evening, the 12th ult.,—Thomas S. Davis, Esq., in the chair.

Mr. Simpson presented to the Society, on behalf of Mr. Warner, of Ross, a series of photographs of *Hereford Cathedral*, and other subjects. He also presented from the proprietors of the *Photographic News* a copy of their *Almanac* for the ensuing year.

The thanks of the Society were accorded for both of these presents.

Mr. WALL, in alluding to the photographic Committee appointed by Her Majesty's Commissioners for the approaching Industrial Exhibition, expressed considerable dissatisfaction at the smallness of the number comprising the former body, and took exception to one gentleman's name in particular, on account (as he alleged) of his not being known to the photographic public in connexion with the art. He animadverted rather strongly on the conduct of THE PHOTOGRAPHIC SOCIETY (London), asking why it was designated the "Parent Society?" *—and why, having "pledged itself to render Her Majesty's Commissioners *no assistance*," it suffered four of its chief officers to undertake the duties "it so resolutely, not to say obstinately, declined?"

The CHAIRMAN trusted that the Committee would not be left with the few names already published, but that more would be added, in order that photographers generally might feel confidence in them.

Mr. V. BLANCHARD then read a paper entitled *A Prologue for the Season*. [See page 442 of our last vol.]

Mr. MARTIN would offer a remark on one part of Mr. Blanchard's paper in which he had expressed a wish that more geniality and greater freedom should prevail at the meetings of the Society; he (Mr. Martin) heartily concurred in that desire, and thought that one step towards its accomplishment would be the abandonment of the formality of rising to address the meeting. He was, of course, sensible that the carrying out of his suggestion might, perhaps, lead to confusion, and would, therefore, direct special attention to the necessity which existed for every gentleman to address his remarks exclusively to the Chairman.

Mr. WALL feared that if Mr. Martin's views were acted upon the meeting would resolve itself into a series of separate discussions, carried on by small companies of two or three members.

Mr. G. WHARTON SIMPSON said that whatever truth there might be in Mr. Wall's remarks, he thought there were many things said in separate discussions which would never be said at all under other circumstances, and he was of opinion that many valuable suggestions were lost simply on account of the nervousness which possessed some gentlemen at the idea of *standing up* to make a remark, which appearing to them at the moment not worth the formality, might nevertheless have an important bearing on the subject in hand. He was disposed, therefore, to take the same view as Mr. Martin, and if that gentleman would put it into the form of a motion he would cordially second it.

A motion in conformity with the above suggestion was then moved by Mr. MARTIN, seconded by Mr. SIMPSON, and carried unanimously.

Mr. HOWARD said, with reference to the proposed modification in the manner of conducting the discussions, he would submit that it was desirable that some restriction should be placed on the number of times that one gentleman might address the meeting.

The CHAIRMAN remarked that if any members who could write papers were, nevertheless, diffident about reading them, they might at once dismiss that feeling, as it was an understood part of a secretary's duty to read the papers of members who would rather not do so themselves, and he felt sure that Mr. Wall would willingly undertake such a task when occasion required.

Mr. BLANCHARD said, in reference to the Experimental Committee, he hoped it would be clearly understood that he had no desire to depreciate their labours; on the contrary, he always regarded it as a very important and valuable branch of the Society's operations. He was of opinion, however, that if the subject for investigation were clearly announced, the members generally might experiment thereon, and on an appointed evening meet and compare notes. With reference to the class for instruction in chemistry, which he was so desirous of seeing established, he thought a sub-committee might be advantageously appointed to ascertain the cost of apparatus, rent of room, &c., and the Society would then have some accurate data to calculate from.

A vote of thanks to Mr. Blanchard for his paper was passed by acclamation, after which the Chairman formally resolved the meeting into a special one, for the purpose of considering the appointment of a place of meeting more convenient for the members of the Society generally.

Mr. SIMPSON proposed that a sub-committee be appointed to collect detailed information, and that the said Committee do report the result of its inquiries at the next meeting of the Society.

Mr. MARTIN seconded the motion, which was adopted.

The usual votes of thanks were accorded, and the meeting adjourned.

* We believe that Mr. Wall is the best authority for the designation "Parent Society," it having been—unless we are much mistaken—conferred *by himself*. He is mistaken in supposing that The Photographic Society declined to render *any assistance* to the Royal Commissioners. The *Council* merely declined to *nominate a Committee*, but can exercise no control over its officers in their capacity of private gentlemen.—ED.

CHORLTON PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting of this Society was held on the 12th ult.,—Mr. William Griffiths, Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, the adjourned discussion on the wet and dry processes was resumed.

Mr. WARDLEY said he wished to say a few words on a subject in which he felt a personal interest, but which he thought it would not be out of place to introduce at this part of the discussion. Mr. Wardley continued:—Most of our members will have seen a leader in THE BRITISH JOURNAL OF PHOTOGRAPHY, of October 15th last, on *Restoration of Sensitiveness*, in which occurs the following observations upon a certain portion of my paper on the Taupenôt process, read at one of this Society's meetings:—"That an *iodide* will not restore the normal condition of a plate that has received an actinic impression where anything approaching to reduction has taken place we are quite prepared to believe; but we are somewhat surprised to learn that Mr. Wardley has arrived at the conclusion that no actinic impression can be removed by an iodide." Before attempting a reply to the above, it may perhaps be as well if I call your attention to the paragraph in my paper which has called forth these observations. It is this:—"A ray of white light falling upon a sensitive collodion plate *cannot* be obliterated by an after-application of an iodide solution, or even iodised albumen." It is somewhat difficult to frame an answer to the remarks of the Editor of our Journal, unless he will allow me to use the term "destructibility of the collodion image by an alkaline iodide," instead of "restoration of sensitiveness." When we destroy an impressed image upon collodion it does not necessarily follow that we restore sensitiveness. In the Daguerreotype process we certainly can destroy the image and restore sensitiveness at the same time; but *not* by means of an *alkaline iodide*, but by free *iodine* or *bromine*. Restoration of sensitiveness is a subject which I have hitherto refrained from touching upon. The question at issue is:—Can the action of a ray of white light be obliterated from a sensitive collodion film by means of an alkaline *iodide*, provided such film be free from organic matter, except that which may be contained in any ordinary collodion bath solution? In consequence of an offer made to publish my experiments to prove the position I took, I now respond to the call; but bear in mind that these experiments were not intended to be applied to photography generally, but simply to have a bearing upon the successful working of the Taupenôt process. During my long practice of this process, I have been assailed by various operators declaring that the first preparation could be conducted in open daylight. I therefore tried several lots of plates so prepared, but I must confess I never obtained a satisfactory negative upon any one of them: all were more or less foggy and stained: some would not yield any kind of picture. In consequence of my non-success, I went in for a series of experiments, one or two of which were so conclusive that I discontinued them. In the first experiment I coated a plate with collodion, sensitised it, exposed one-half to daylight, carried it to the dark room and washed it well with water, immersed it in a solution of iodide of potassium for two or three minutes, drained and albumenised it in the usual way, and dried. This plate was then sensitised in the acid silver bath, washed, dried, and exposed in the camera. When developed, the two halves of the plate exhibited a great difference. That portion which had been exposed to light during the first preparation was foggy and stained; the other half, which had been protected from white light, was bright and satisfactory. This experiment may not be conclusive or correct, owing to the presence of organic matter: to meet that objection I tried another plate *without* the albumen. The transparent slide before you was coated with ordinary collodion, sensitised and exposed, then removed to a dark room, well washed with water, solution of iodide of potassium poured on half of the plate, the excess removed with a little water, and afterwards developed in the ordinary way. I think you will say the iodide has *not* had the least influence upon the image to which it has been applied. You see it is equally intense, and as full of half-tone as that portion which has been treated with the solution of iodide. This fact was published years ago. I am afraid that photographers of the present day are apt to underrate the value of papers written by men whose names have disappeared from the pages of our present photographic publications. On looking over the photographic literature of our day we are often startled by some grand new process or invention. Some of these may be of great value, and not a few can be traced to early experimenters. Pardon this digression; and in conclusion and in support of what I have to-night advanced, allow me to quote from a paper by Mr. J. G. Berry, *On the Theory of Photographic Development*, published in THE LIVERPOOL PHOTOGRAPHIC JOURNAL, February, 1855:—"We will take a plate of glass, collodionise and excite in the usual way; we will wash it in water, to remove the free nitrate of silver; we will then expose it in the camera; we may again plunge it into water, or even a solution of iodide of potassium, and replace it in the camera, exposed to a fresh object; and then, on the application of the pyrogallic solution, mixed in the usual way, with a small portion of silver, we shall evolve both the images impressed. They will be quite uninjured by the rough usage they have undergone, and are in every respect equal to what they would have been if manipulated in the usual way." This quotation shows that theoretically I am not alone in this matter, W have very much to learn of the theoretical part of photography, which necessitates or imposes a duty on those who have time and opportunity to pursue this department, in preference to inventing or adopting some trivial affair that can well be dispensed with. More theory will lead to greater things.

Mr. Fawcett quite agreed with Mr. Wardley that the first preparation of collodio-albumen plates ought to be conducted in the dark room, otherwise the plates would generally turn out to be unsatisfactory. Some time ago he was in the habit of preparing them in daylight, and met with countless failures from fogging and other stains.

The Chairman said it was an undoubted fact that some operators conducted the first preparation in daylight and obtained good results. How could that be accounted for? He suggested that it might be owing to their *probable* use of free iodine in the iodised albumen, which most photographers acknowledged would remove any actinic impression made during the first preparation. Referring to that part of the editorial leader in which it is stated that "if anything approaching reduction has taken place on a plate which has received an actinic impression, an iodide will not restore its normal condition," he said the integrity of this statement was fully borne out by facts; but he might ask—Does not reduction invariably occur when a sensitive surface is exposed, for however short a time, to white light? He was one of those who believed it did; and with a view to satisfying himself on that point he had, some twelve months since, undertaken a number of experiments, one or two of which he would briefly describe. A collodionised plate was sensitised in the ordinary way, and exposed wet in the camera for such a time as was considered sufficient to impress a negative. After thoroughly washing off the free nitrate, a solution of pyrogallic acid (without free acid) was poured over it for an instant. It was again washed, and the iodide of silver removed by cyanide of potassium. Nothing was visible on the plate after this treatment; but on the application of the usual pyro. developer, mixed with a few drops of nitrate of silver solution, a faint but perfect negative made its appearance. Another plate similarly prepared and exposed was, after well washing, treated with dilute nitric acid (one part acid to twenty of water), again washed, and a solution of pyro. without free acid or silver applied for a few seconds. It was then washed, fixed with cyanide of potassium, and pyro. developer mixed with silver poured over it; but not a trace of an image could be seen. Other collodion plates were prepared. After being taken from the silver bath they were well washed by allowing a stream of water from a tap to run over them for at least ten minutes, when a drop from them gave no precipitate with a chloride. They were then dried and exposed in the camera for times varying from two to four minutes. Previous to developing one of them, a camel-hair pencil, dipped in the dilute nitric acid, was drawn across the middle of the plate. They were then all treated exactly like the first plate mentioned—that is, first with plain pyro., then fixed, and finally with pyro. developer and silver. The result was that a picture was produced on every plate except that which had received the maximum exposure. On that part of the plate which had been touched with dilute nitric acid not a trace of a picture could be obtained. One remarkable fact remained to be noticed, namely, in every case in which a washed *dry* collodion plate had been exposed in the camera, and treated as described, the result had invariably been, not a negative, but a faint *transparent positive*. In the explanation of this singular fact is involved the proof that actinic light acts essentially as a reducing agent. Take, for example, the sensitive wet collodion plate, and represent the film, chemically, as containing before exposure, Ag I + (Ag I, Ag O, No.$_5$), + Ag O, No.$_5$. After exposure the parts acted on by light become Ag I + Ag O + Ag O, No.$_5$ + No.$_5$ (set free) + Ag O, No.$_5$—the picture being formed by Ag O, subsequently reduced by the developer to the metallic condition. In the case of the dry collodion plate previously adduced, where no free nitrate or other salt of silver is present in perceptible quantity, the film contains Ag I + (Ag I, Ag O, NO$_5$); and in that condition he believed it was more readily susceptible to actinic influence than when wet—an instantaneous exposure being sufficient to produce the change represented by Ag I + Ag O + Ag I + (N O$_5$ set free). A long exposure would have the effect of partly reducing to the metallic condition the newly-formed Ag O, and thus produce the effect known as solarisation or reversed action of light. These views were offered not altogether as his own, but rather as the result of his study of the works of Hunt, Miller, Barreswil, Davanne, and others. He regretted (from the want of sufficient notice that this subject would be brought forward) he was not prepared to enter into the details of other experiments which had convinced him still more strongly of their correctness.

Mr. Radcliffe said he had recently been experimenting in the same direction, and had arrived at the conclusion that the image formed in the collodion film was oxide of silver.

Mr. Knott did not think any reduction took place, but that the particles of iodide of silver, under the influence of light, became endowed with a kind of polarity which enabled them to attract the particles of silver thrown down by the developer. Referring to what he had stated at the last meeting respecting the solubility of iodide of silver in a solution of nitrate of silver, he wished to observe that the *quantity* a given strength would dissolve was greatly affected by the proportion of organic matter in the shape of alcohol and ether which it contained. A bath which had been some time in use would hold in solution a greater quantity than a new one, and would be more susceptible to variations of temperature. Such a bath when heated much over 60° would become milky, and when reduced to a low temperature would deposit crystals of iodide of silver. The best temperature would probably be 60° or thereabouts for ordinary work.

Mr. Wardley said he had often noticed that the drop which drained from the corner of a plate just taken from the silver bath assumed a milky appearance, in consequence, he now supposed, of the evaporation of the alcohol and ether from it, causing the iodide of silver to be precipitated.

After some remarks by Mr. Knott, a member proposed that the discussion should be again adjourned.

The Secretary drew the attention of the members to the rule which requires each of them to contribute one or more prints to the Society's portfolio.

Several prints were then presented, and the usual vote of thanks to the Chairman closed the proceedings.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society held its usual fortnightly meeting on the 18th ult., when J. D. Marwick, Esq., President, occupied the chair.

Alexander Annandale, Esq., and James Slight, Esq., were admitted members of the Society.

A magnificent album, of large size, was presented by R. M. Cameron, Esq., a member of the Society.

A considerable portion of the evening was spent in altering and adjusting the laws; after which Mr. W. H. Davies read a paper, *Hints on the Nature of Pictorial Beauty and the Principles of Composition.* [See page 3.] This paper was illustrated by numerous diagrams, photographs, and engravings.

The thanks of the Society were awarded to Mr. Cameron and Mr. Davies. It was agreed that, as the next usual day of meeting fell on New Year's Day, the meeting should be postponed till the third Wednesday in January.

Foreign Correspondence.

Paris, December 27, 1861.

The meeting of the French Photographic Society of the 20th instant was inaugurated by unpleasant news. It was announced that the space allotted to the productions of French photography at the approaching Exhibition at London was so limited that there would be scarcely room for a few specimens from each. Decidedly the Commission does not manifest an excess of good-will towards the new art. It appears to have forgotten the large hospitality given in 1855 to the English photographers at the Palace of the Champs Elysées. I think that if the idea emitted a few months back of a subscription for a special Exhibition were at present brought before our artists it would have some chance of success. What will become of the amplification in presence of the scanty space that is offered? Happy those who limit themselves to stereoscopic pictures or to microscopic jewels!

M. Reynaud has made numerous experiments upon the iodide, bromide, and chloride of silver. The results were communicated to the Society the other evening, and are as follow:—

M. Reynaud's comparative researches have led him to the conclusion that, if the iodide of silver be slow in taking the impression, it gives pictures which are dense and of great finish, and is especially suitable for small-sized *clichés*.

The iodide of silver with cadmium is more rapid, but it often produces a veiled effect. To avoid this inconvenience one or two per cent. of chloride of zinc should be added to the collodion.

The iodide of silver with ammonium is not so sensitive, but it gives images of great artistic perfection. The author has remarked that the sensitiveness of the different iodides is proportioned to their solubility in alcohol. To reach the maximum sensitiveness the collodion should contain but little iodide.

The neutral silver bath generally gives veiled pictures. To remedy this a little nitric acid is added—one drop per 100 grammes, for instance. The author has remarked that hyponitric acid augments the sensitiveness. The carbonate of soda or of lime, employed for neutralising the bath, appears to him to have very good results.

Bromides added to the iodides in the collodion allow of the reproduction of certain details of colour, which, without their aid, could not be obtained. The following is a formula recommended by the author:—From three to four grammes of bromide of potassium and twelve grammes of iodide per litre of collodion.

At the same meeting the Secretary presented a very convenient apparatus. It is a travelling alembic, by which, without loading oneself with heavy and cumbersome luggage, distilled water may be obtained on the spot—the furnace, the cucurbit, the worm, and all the pieces of the apparatus, which are in copper, can be packed one within another in telescope fashion, and form but a cylinder of moderate size and weight.

In one of my recent letters I communicated the process of the Abbé Guiraud, according to which he adds crystals of nitrate of silver, instead of kaolin, when the bath, after long use, wants

purifying. This process has been tried here successfully by different operators. I am glad to mention the fact, as it may be useful to some of your readers.

As you may probably have seen by the report already commenced in the *Moniteur de la Photographie*, our art was very well represented at the Florence Exhibition. New names have gained their places by the side of those of Alinari, Dovizielli. Bernond, Semplicini, and others well known. The stereoscope has spread through Italy of late years, and the amplifications are as much in favour with public and with artist on that side of the Alps as on this. As to the visiting card, I do not speak of its acclimitation in Italy, for it reigns in every country, symbolising in photography the two leading features of our period, multiplicity of product and cheapness.

I have already spoken to you, I believe, of a projected publication which was to present objects of art, especially modern paintings, in the size of visiting cards, The undertaking was begun and is being continued. M. Micheletz is bringing out a considerable number of his reproductions in this essentially popular form. The Brothers Bisson, carried away by the current, are about to publish their different collections of Swiss views in the same size. Just imagine the chain of Mont Blanc or of Mont Rosa on a visiting card! It must, however, be added that they are executed with a skill which might save a worse idea, and that they form a most elegant Lilliputian album, and a very pretty New Year's gift.

Photography has recently been highly honoured in the person of M. Nièpce de Saint Victor. The Academy of Sciences has unanimously awarded to our friend the Trémont prize, which was last accorded to Rhumkorff. To give greater value to the recompense the Academy has decided that the income of 1,000 francs attached to the foundation shall be continued to M. Nièpce during three years. Hitherto numerous encouragements have been bestowed upon photographers by the Government. Every year decorations are given to the cleverest practitioners and experimentors. This year it is the *savants* who have spoken, and, in general, their judgment is based upon solid grounds.

As I have spoken of encouragements accorded to photography, I cannot well close this letter without paying my humble but heartfelt tribute to the memory of the enlightened patron it has just now lost, and whose name I cannot write without emotion—I mean Prince Albert. The news of his unlooked-for death has caused a painful impression among all classes in this country, and more especially among men of art and men of science. Photographers who belong to these two divisions of society have felt their loss not the least keenly. While the Prince patronised the new art in England, he gave a kindly welcome to meritorious productions from other countries. Of the interest he took in the progress realised in France, I can, perhaps, speak more feelingly than another, having frequently been charged in the Prince's name to add to his rich collections the newest and most remarkable works appearing here. Thus, in many circumstances, I have been enabled to appreciate the elevation of his taste in matters of art—the extent of his knowledge—and the delicate tact with which he acknowledged services rendered. ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

"AWARD OF MEDALS AT EXHIBITIONS AND ELSEWHERE."

"A considerable section of the thinking part of the community opposes all presentation of prizes, medals, or, indeed, competition of any kind—holding that more harm than good is done by them. And then, they say, in principle the practice is wrong, appealing as it does to the base part of our nature."—JOHN CRAMB.

"Worth! What is a ribbon worth to a soldier?
Worth? Everything! Glory is priceless!"—BULWER LYTTON.

SIR,—And so Mr. John Cramb has discovered in some hitherto unknown locality, a considerable portion of the "*thinking*" community who silently (for surely by no representative voice or pen did they ever before make themselves heard or known) oppose that emulation which seeks only the glory of success! Well, this certainly is the age of discovery! But this great modern discoverer has contented himself with a bare announcement, so that we are constrained to ask where this "considerable section" may be examined by the curious wonder-lovers of our day?—how it (the "considerable section" aforesaid) opposes the presentation of prizes, medals, or indeed *competition of any kind?*—and what, according to its definition, constitutes "the base part of our nature?"

Now, if I offered Mr. John Cramb a prize in *money* for, say, the best paper on moral philosophy, should I not appeal to his breeches pocket only? If, again, I offered that gentleman "a piece of plate," would not its value either rest in the honour it commemorated or in the money it would "fetch?" If in the latter, I should not thereby get out of his breeches pocket; and, if in the former, might I not as well offer him a medal of silver, gold, or copper, or even a classic wreath of laurels, plucked from my own back garden, wherewith to adorn his head—as the homely saying has it—"on high-days, holidays, and bonfire nights," after the fashion of old Greece? We often hear that

"The value of a thing is just as much as it will bring;"

and, for my own poor part, I think that a medal, which brings me the gratifying assurances that all my laborious strivings to escape from the common ruck of unaspiring mediocrity are, in the opinion of competent authorities, crowned with success, must be of infinitely more worth to me than the paltry and contemptible price I could sell it for in a broker's shop, or in that of a dealer in old gold and silver. Perhaps *this* is a proof that "the base part" of my nature has been appealed to: *perhaps it isn't.*

Passing from this portion of the article under notice, and coming to ideas not less singular, but more definitely acknowledged as the writer's own, it seems to me that Mr. John Cramb's sole purpose is avowedly to urge *the encouragement of mediocrity!* It is not for the one best picture that we are to award our medals, but for the best twelve, or six, or eighteen. The artist who goes thoughtfully to his work, studying its subject, watching it in all its various phases of changeful atmosphere and *chiaroscuro*—who destroys picture after picture, refusing to be satisfied with anything short of actual excellence—must give place to the gentleman of the nimble fingers and active limbs who, never stopping to think about such unimportant things, merely sees that his bath is properly mixed, and his plates carefully prepared, and pops off a plate—to use Mr. Cramb's own illustration—as a rifleman pops out a bullet. If, says Mr. Cramb, "Societies desire to mark with their approbation the power of producing good pictures *rapidly** and certainly, then it might be open for consideration if something of the rifle competition kind of trial might not be worthy of consideration." In another passage, the author of this very novel suggestion proposes that we should take a hint from the race-course. According to Mr. Cramb, then, rapidity and certainty are the loftiest qualities of our art—qualities which are to be fostered and encouraged above those which distinguish it from the mechanical and commonplace—above the artistic, which is merely intellectual—above the experimental, which is merely scientific. Care and dexterity are to be set up as the loftiest pinnacle of success, and all the aspirations of the photographer are to be cramped and confined within the narrow boundaries of the mechanical! The great principles, based upon the encouragement of a laudable ambition, which have regulated the proceedings of Fine Art Societies in all countries, from the time of their existence, in the "award of medals at exhibitions and elsewhere," are to be given to the winds at the bidding of this bold Scotch gentleman! You may, indeed, urge that such principles are at the foundation of all that is good and great in the world—that they have been lauded and appreciated from the earliest times—that from them sprang the first great International Exhibition—that they reared each of the puny and weakly infants of art in Greece and Italy, until their glorious prime inspired the world with awe and wonder—and you may urge a great deal more in the way of such considerations; but here comes one of a race celebrated for noble ambition and intellectual aspirings (Mr. Cramb is a Scotchman I am told), whose unhesitatingly expressed conviction is, that "in principle the practice is wrong, appealing as it does to the base part of our nature," and who thinks mediocrity more worthy of encouragement than superior excellence. Fie! Mr. Cramb. Whether I consider your country, your position as an active and prominent member of a photographic society, or your pretensions as a photographer, I am equally inclined to cry, fie upon you! Just think the matter over, and then publicly recant. Many will think the better of you for doing so, I am sure. And pray do not be angry with me; because whenever one publishes one's lucubrations (the term, at any rate, applies to my own productions), one invites criticism—and criticism, as I very well know, will be sometimes adverse. Had your paper been simply read at your Society, and had it there passed unchallenged, I too should have been silent; but appearing in THE BRITISH JOURNAL OF PHOTOGRAPHY as an original (decidedly original) communication, I do not think it ought to pass without a strong protest following in its rear. Mr. Brown's communication was hardly sufficient, referring, as it did, chiefly to the attack upon the very excellent Society of which he is Secretary. Trusting that you will not misunderstand my *primuvo mobile*—or suppose I am a disbeliever in the old saying of *Tot homines quot sententiæ*—I conclude. Truly yours, A. H. WALL.

TANNIN PROCESS.

To the EDITOR.

SIR,—Will you give me, through your valuable Journal, the answers to the following questions. I have been working the tannin process, and have got very good results. I have had a few failures, which I wish to know the cause of.

* The italics are Mr. Cramb's.

1. Bath used, thirty-five grains.
2. Collodion, negative, for wet process.
3. Tannin used, fifteen grains solution of.
4. Developed with pyrogallic acid, three grains to the ounce of water, with equal bulk of nitrate of silver solution, composed of nitrate of silver four grains, citric acid six grains, water one ounce.

I fixed with cyanide of potassium.

Fault 1. Covered in the dark parts with little pin-holes.

Fault 2. The finished picture looks very green, like the colour of grass. I used gelatine. I am, yours, &c., J. BURDON.

December 11th, 1861.

[Cyanide of potassium for fixing is quite inapplicable for this process, as, indeed, for any one in which organic matter plays an important part, because the intensity is so immensely reduced; hence the green colour complained of. But any alkaline substance has also a tendency to loosen the film. The pin-holes may arise from insufficient filtration of some of the solutions, or from the use of a bath of nitrate of silver insufficiently saturated with the iodide.—Ed.]

MR. J. CRAMB'S CAMERAS.

To the Editor.

Sir,—In reply to Mr. Cramb's letter in your last, I am sorry to say that his letter and explanation about his camera, dated August 26th, and published in your Journal of September 2nd, had escaped my notice, otherwise I should not have been so uncourteous as to take no notice whatever of it. Mr. Cramb has evidently not seen one of Mr. Dancer's cameras, or I am sure he would at once acknowledge that the principle is the same as his own. I do not—nor did I at the meeting of the Manchester Photographic Society—accuse Mr. Cramb of *copying* from Mr. Dancer; but simply pointed out to the meeting the features in the figure and description of Mr. Cramb's camera, as published in your Journal, which years ago had been adopted in a better form by Mr. Dancer. This was done in no unfriendly spirit, but simply with the view of giving what merit there might be due to the real inventor.—I am, yours, &c.,

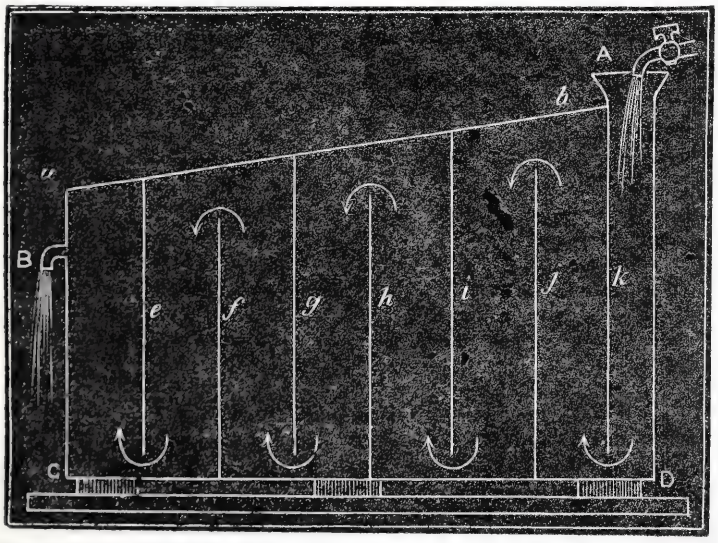
JOSEPH SIDEBOTHAM.

Manchester, Dec. 23rd, 1861.

PRINT-WASHING.

To the Editor.

Sir,—I, like many others, have experienced the difficulties of washing prints. The following method I have used for the last four years with success. Referring to the diagram—



The trough is made of ¾-inch pine, A B C D, two feet long, one foot three inches wide, one foot three inches at B D, and nine inches at A C. The sides are grooved to receive the partitions, *e f g h i j k*, and in the positions marked, the grooves being about two inches apart. Two or three prints are put *edgeways* into each compartment. The water is supplied at A, and, passing in the direction of the arrows, makes its exit at B effectually. It removes all soluble matter in *one* or *two* hours, according to the force of the supply of water. If the description be insufficient, I shall be happy to give any information required.—I am, yours, &c.,

H. R. NICHOLS.

[The preceding note testifies to the prevalence of the idea that running water is an efficacious agent in removing the fixing agent, with its matter in solution—an idea that we combatted in our paper read at the last meeting of the Photographic Society, and published in our last issue. Upon what grounds does our correspondent assert that the soluble matter is effectually removed? How has he tested the correctness of the supposed fact?—Ed.]

INDIA-RUBBER SOLUTION FOR PRELIMINARY COATING.

To the Editor.

Sir,—In this instance "J. C.B." cannot have read the paper thoughtfully or he would have gathered the information he requires. I have never weighed the India-rubber or resin, but should give the following as the nearest estimate:—

Pure India-rubber	2 grains.
Common rosin	1½ ,,
Coal tar naphtha	1 fl. ounce.
Spirits of turpentine	1 ounce.

This I should give as the minimum proportion of the solvent, and will admit of considerable latitude. My advice is to employ the *least* possible quantity of India-rubber to attain the required result.—I am, yours, &c.,

JOHN GLOVER.

ANSWERS TO CORRESPONDENTS.

☞ With this number of the Journal is PRESENTED to our Readers "The British Journal Photographic Almanac" for 1862.—The Almanac will be on Sale to Non-Subscribers at the nominal price of 3d., and may be had from any of our regular Agents, and through the Booksellers.

C. B.—Not till the summer.

C. Alfieri—We will write to you.

F. S. F.—A flat bath will do, though a vertical one is better.

Samuel Lever.—We had no notice of the intention to bring it forward.

T. R.—Received. We shall be glad to have the communication promised.

Pharez.—Standing figures require a lens of larger focus than that you name.

J.C.B.—We have handed your inquiry to Mr. Glover, whose reply we give in the "Correspondence" column.

R. P. C.—Your note arrived a day too late for reply in our last; but we had answered a similar inquiry to your own. See reply to "W. Daniels."

J. H. Slater.—Either alkali will do; but, after neutralising, you will do well to expose to sunshine, and filter—again making it *very slightly* acid before using it.

Photo. (Manchester).—See an important article, *On a New Process for Photographic Printing*, by Mr. Emerson J. Reynolds, of Dublin, in our present number.

Geo. B. Shepherd.—Your prints appear to us to be mealy in consequence of too weak an exciting bath. This you can easily test by floating a sheet of your paper on it a second time after its being once *excited and dried*. This will give a double dose of nitrate of silver; and, should our conjecture be correct, you ought to obtain a vigorous print by this treatment. Of course we do not recommend this method of proceeding except *as a test*. If you find it answer, your remedy will be to double the strength of your nitrate bath. We cannot reply privately.

Un Pauvre Homme.—1. Take one table spoonful of good honey, and add to it two of *distilled* water; beat and stir well, then filter through bibulous paper. If used within twelve hours after the preparation of the plates, but little, if any, longer exposure is requisite. 2. Oxide of silver is formed by adding caustic potash to solution of nitrate of silver, also by the addition of liquor ammonia; but, as the oxide is soluble in the latter, an excess of ammonia re-dissolves the oxide. 3. It is no doubt your paper that is in fault: it should *not* turn red in the hyposulphite. Rive paper is generally preferred for alkaline toning. Mr. C. Jabez Hughes, of Oxford-street, *does* keep it in stock, we have no doubt.

X. Z.—The addition of hydrochloric acid ought to throw down the silver in the form of a chloride, which should be well washed in several changes of water, dried at a gentle heat, and fused with twice its weight of a mixture of the carbonate of potash and soda in a Cornish crucible brought to a red heat. Or the silver may be precipitated as a sulphide, by the addition of sulphide of potassium. The black sulphide to be washed, dried, and pulverised, and rubbed up in a mortar with twice its weight of nitre. The mixture is to be thrown into a crucible, little by little, the crucible having first been made red hot. Deflagration ensues on each addition, and a small network of silver is reduced, and will be found in the crucible.

J. L. (Perth).—You certainly are very docile, and very successful too. Your *Gannachy Bridge* is excellent. A little more exposure would have perhaps helped to improve your dark foliage somewhat, but you really are an operator far above the average of amateurs. The *Rumbling Bridge* is an old friend: we have visited the spot, and planted our camera on the point of rock depicted in your left corner, not without considerable risk. We lent our negative to a professional brother, but have never received it back again—so that the fate of ours is worse than yours of the other bridge. If your negatives will bear more lateral enlargement, why not cut your paper differently, and, if needful, waste a little rather than curtail your views? Does not the grey margin arise from a thickened edge of your collodion film (the lower edge in pouring off) obstructing the actinic rays more than the rest of the negative?—and thus the printing of that part is not so intense as it need be, and consequently tones imperfectly. If this be not the cause, it may be in the method of using your printing frame, so that a slight projection of the frame may *partially* shade that edge from the action of the light. Whenever your hyposulphite of soda bath is milky in appearance it is decomposed and in a dangerous condition. It is free sulphur which causes the milkiness: it should be filtered or carefully decanted after the deposit has settled, and a lump of chalk added to correct acidity. We shall be pleased to hear from you on the other matter when you are quite ready. Thanks for your good wishes, which we fully reciprocate.

*** The Position Assigned to Photography at the International Exhibition of 1862.—We regret to have been compelled, at the last moment, to withdraw the very excellent letter of "H. P." It shall appear in our next number.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 158, Vol. IX.—JANUARY 15, 1862.

Restoration of Sensitiveness.—In the report of a meeting of the Chorlton Photographic Society which appeared at pp. 15 and 16 of our last number, some very interesting experiments bearing upon this subject were described by Mr. Wardley and Mr. W. Griffiths, which we regret did not reach us in the form of regular papers, instead of conversational remarks, as from their importance they deserve a more marked and formal record than they enjoy in their present position. In looking over back numbers of a Journal the reader is apt to skip mere reports of meetings as generally containing matter rather of passing than of permanent interest, the attention being more frequently given to distinct articles and papers; and, therefore, it is that we would have preferred had Mr. Wardley's excellent observations been treated as we are suggesting, and as they certainly deserved to have been. On first perusing the report we felt a twinge of conscience lest we had inadvertently, in our editorial comments, made observations that had been obnoxious to Mr. Wardley's sense of justice; so we immediately referred to the article quoted at p. 355 of the last volume, by which, however, we have been reassured, for we find that we carefully abstained from expressing anything like doubt of Mr. Wardley's observations, confining our remarks to intimations of surprise which we did, and do still, entertain at the results ascertained. It is, in our judgment, a fact of considerable importance to establish that "reduction invariably occurs when a sensitive surface is exposed for however short a time to white light," as suggested by Mr. Griffiths. This is not in accordance with our present opinion, though we are quite prepared to change it upon proof of its want of soundness. One of the chief difficulties with which we have to contend in acquiescing in Mr. Griffiths's views, consists in the fact that no amount of exposure is sufficient to cause a visible reduction of pure iodide of silver in the same way as occurs with bromide or chloride; and another huge stumbling-block to our apprehension exists in the absence of any visible deposit, however minute, upon a collodio-albumenised plate when carefully examined by microscopic aid, from which we infer that the picture in this case partakes rather of the nature of a *stain* than a deposit. However, as we have already stated, we are quite open to conviction, and shall look forward with pleasurable anticipations to the resumption of the debate at the next meeting of the Chorlton Society.

New Photographic Printing Process.—We solicit the attention of our readers to a paper, by Mr. Emerson J. Reynolds (which appeared in our last number), upon a subject of no trifling importance—the production of photographic paper proofs with salts of silver, and toned with gold, but with the very important feature of an entire absence of the use of hyposulphite of soda in any stage of the manipulations. The method of proceeding will be found, on reference, to hinge upon the use of oxalate of the peroxide of iron, in the first instance, in order to receive the actinic impression, an insoluble oxalate of the protoxide being formed under the action of light. So far there is nothing new, the same agent having been employed by a French photographer as a basis for a carbon proof, and by Dr. Draper, an American gentleman, and others, for actinometrical purposes; but Mr. Reynolds has found, by experiment, that silver is reduced by the protoxalate of iron from its ammonio-nitrate solution. Hence, after removal of the unaltered peroxalate of iron from the paper, he produces his picture by a species of development or toning, the faint yellow picture being rendered black by the deposit of silver from a wash of the ordinary ammonio-nitrate of silver with which it has been covered: it then remains but to wash the print in distilled or rain water, and the operation is finished. The proof may, however, according to Mr. Reynolds, be toned with gold in the usual way.

In the earlier experiments it was found that the half-tones in the finished picture were not equal to their appearance when first produced, and it is no little triumph to have achieved the knowledge of how to avoid this defect. An explanation of the cause and remedy for this defect is given in the paper, and it is, in our opinion, a matter of more moment than might at first sight appear, because it not only applies to the process now before us, but suggests a course of action with reference to the ultimate production of satisfactory proofs in carbon—the chief defect in which, as at present existing, is the absence of gradation of half-tone. It is by no means improbable that the oxide of chromium, formed by the actinic action upon bichromate of potash, and employed as a basis for nearly all the carbon printing processes, may be soluble in a solution of the latter, in a similar manner to protoxalate in the peroxalate of iron, which would account for the degradation of half-tone likewise, and may also very possibly be remediable, by the use of some addition to, or modification of, the salt of chromium at present employed. A satisfactory solution of the carbon printing problem is of such vast importance that it needs no advocacy on our part; and we feel assured that it will be sufficient to those of our photographic brethren who have time and taste for experimenting to suggest to them the desirability of ascertaining how far the oxide of chromium may be soluble in a solution of bichromate of potash, and whether it may not be possible to wash away the unaffected bichromate of potash by aid of some solution which will prevent its dissolving the oxide of chromium. This once accomplished, we have little doubt that by following the excellent plan of Mr. Osborne in preparing his impressions for photo-lithographic purposes—that of applying the printer's ink before removal of the superflous chemicals—direct proofs upon paper in ordinary printing ink and with proper gradation of tone may, ere long, gladden our eyes.

A Tribute of Affection.—We learned, recently, from Mr. Rejlander that he purposes exhibiting at the International Exhibition a new composition of an allegorical character, upon which he is at present at work, intended as a tribute of respect and affection for the memory of the late Prince Consort, who

was a very kind patron of this deservedly celebrated photographer. It would not, of course, be correct for us to describe the intended composition, even were all the details settled, but, though the general scope of the subject has been arranged, there are many points yet requiring much careful thought and consideration before their final adoption; for our readers know well that Mr. Rejlander is an artist in the largest sense of the word, and all his works are undertaken with a definite object in view—all the parts of them being carefully arranged not only with an eye to their individual effect, but to their influence upon one another and their combination as a whole. Nothing is left to take its chance. Every fold of the drapery is conned over and carefully considered, by which we would not have it inferred that it is mechanically arranged; but though allowed to fall naturally, unless it displays the effect intended it is draped and posed and re-posed until the sought for classical curve is attained. Nay, is a shoulder a trifle too forward, or the sweep of an arm a suspicion of a shade out of the exact line of beauty, the model must sit and sit again—no defect being regarded as trifling—no labour too tedious to arrive at a mere complete expression of the artist's mind. And yet some of our critics assert that it is the *camera* which does it all!—there is *no* brain work in a photograph!

There is something touching in the idea of making photography pay a tribute to the memory of one who, during his life, did so much to advance, encourage, and elevate its status and mission; and we are rejoiced that Mr. Rejlander, in carrying out his design, will have the benefit of one of the very best photographic likenesses of the deceased Prince that has been produced. The negative was taken by Mr. Rejlander on the occasion of his visit to Osborne in March last, at the command of His Royal Highness, and is a bust in profile against a light background. Of course our readers will have divined that the composition will be one of those combinations of portions of many negatives for which Mr. Rejlander has won renown in times past.

During our late interview, we had the pleasure of turning over a portfolio containing many suggestive and interesting art studies. One, entitled *Libation*, is particularly fine in pose and drapery; another, called *Pity the Sorrows of a Poor Old Man*, is a perfect little gem; a third displays a bit of quiet humour, and is designated *A Fellow Feeling Makes Us Wondrous Kind*, and consists of a young man making phrenological researches over the head of a girl with his right hand, while with his left, under her chin, he raises her face, on which an expression of roguish archness is unmistakeably depicted. *Welsh Courtship* is remarkable for its wonderful atmospheric perspective, and *Adipose* for its exquisite perfection of figure, though the last-named is only useful to the artist as a study.

Congratulation and Defence.—We congratulate the members of the Birmingham Photographic Society in their acquisition of Dr. Anthony as their President. We are convinced from the known skill, scientific attainments, and energy of this gentleman, that he is likely to exercise a very beneficial influence in inducing photographers in the neighbourhood to unite and work harmoniously for the advance of our art.

There is one point in the address delivered by Dr Anthony at the last meeting of the Society on which we desire to offer a short comment, not by way of exception to the advice given—that of obtaining for the Society copies of all the foreign journals—but directed against an *implied* neglect (unconsciously, perhaps, on the worthy Doctor's part) with which we, as journalists, are charged. The President says [see page 33] that he expects our *amour propre* will receive a slight shock at the International Exhibition, which will "show us the necessity of being well acquainted with the contemporary discoveries of our photographic brethren throughout Europe." Further: "if these foreign journals should be sealed books to some members, I doubt not that others would undertake to give the Society, from time to time, abstracts of the information contained in these journals," &c.

We have simply to remark upon this point that *we* are regularly supplied with *every foreign journal* published, whether French, German, or American, that treats of photography, and never fail to give translations or abstracts of everything not only that has value but that *appears* to have any interest whatever for our readers. In addition to this, we have *special correspondents abroad* who furnish us with information of all that is doing in their respective localities, so that we can tell our friends beforehand that they will not find in the foreign journals the anticipated information, or anything of value that they do not also meet with in these pages. As journalists, we should regard it as a lapse of duty not to keep them well informed on the progress of our art in all quarters of the globe.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

CITRIC ACID.

Synonymes.—*Ger.* Citronsäure, *Fr.* Acide Citrique.
Composition.—C_{12} H_5 O_{11}, 3 HO + 2 HO.
Equivalent.—210.
Preparation.—The sources of this interesting compound are very numerous, being found in the leaves and wood of many shrubs and trees: among these may be mentioned the lime, lemon, orange, prune, gooseberry, currant, strawberry, lettuce, tobacco, mountain ash, and others. In many of these it is associated with malic acid—in some instances in equal proportions, but in the four first named it exists in the free state, and mixed with little or no malic acid. Accordingly one of these is selected as the source from which to manufacture the acid for commercial purposes. The method is as follows:—Lemon or lime juice in any convenient quantity is saturated with carbonate of lime—*i.e.* whitening or chalk—until it ceases to effervesce and the solution no longer reddens litmus-paper. The mixture is then thrown on a linen filter, and washed with hot water until the liquid runs through colourless. The insoluble citrate of lime which remains on the filter is then treated with a sufficient amount of dilute sulphuric acid to decompose it—the result of the reaction being sulphate of lime, which is insoluble, and free citric acid, which remains in solution. The quantity of sulphuric acid necessary to effect this change amounts to about 60 per cent. of strong oil of vitriol to the dry citrate of lime: the acid should be diluted with eight parts of water before adding it to the insoluble citrate of lime. The separation of the solution of citric acid from the insoluble sulphate of lime is effected by straining through linen, as in the former case: the insoluble salt is, however, only slightly washed with a little *cold* water, and the clear solution is then boiled down until it attains a specific gravity of 1·13, at which point the evaporation is conducted with greater care by means of a water bath, and until it acquires a syrupy consistence, at which point it will soon become covered with a pellicle of solid acid, when it should be removed from the water bath and cooled down to the crystallising point *as rapidly as possible.* To the reader who possesses a slight knowledge of chemical manipulation this latter direction may seem somewhat strange, as the most suitable method for obtaining good crystals is generally considered to be the *slow cooling* of strong solutions, or the spontaneous evaporation of weak ones. The reason, however, is this: in order to ensure the complete decomposition of the citrate of lime, an *excess* of sulphuric acid is employed, and it is this excess of sulphuric acid which would, at the elevated temperature acquired by the solution when it arrives at the syrupy condition, decompose the delicate organic acid, more or less, into a black mass. This undesirable result may be avoided by making the citric acid suddenly assume the solid state by rapid cooling. The crystals are purified by recrystallisation, the mother liquors being treated with more chalk, after the manner of the original lemon juice. There are certain details of manipulation to be attended to in conducting the above process which ought not to be omitted. With the object of separating the mucilage contained in the lemon-juice it is found advantageous to allow an incipient fermentation to set in and to strain the liquor before the addition of the chalk is commenced; and this latter operation should be conducted nearly at the boiling temperature, and be accompanied by constant stirring. Finally, in order to decompose the *acid* citrate of lime which is at first formed, a little caustic lime should be added after the cessation of the efferves-

cence, and, as before said, until the solution no longer reddens litmus-paper. The decomposition of the citrate of lime by sulphuric acid should also be accompanied by stirring; and in this way a gallon of good lemon-juice should yield from eight to twelve ounces of citric acid.

Properties.—Citric acid forms beautiful transparent, colourless crystals, having the primary form of a right rhombic prism. Their taste is intensely sour, and they are soluble in less than their own weight of water at 60° F., and in half their weight at 212° F.—soluble in alcohol, but insoluble in ether. In stating the composition at the head of this article it will be observed that the formula includes the anhydrous acid, three atoms of basic water, and two atoms of water of crystallisation; and such is the composition of the crystals obtained by the spontaneous evaporation of a cold solution. The ordinary crystallised acid of commerce contains one atom of water less. Citric acid is a tribasic acid, by which term it is signified that if it be desired to prepare citrate of soda three atoms of carbonate of soda will be required to neutralise one atom of citric acid. *Free* citric acid retards the precipitation of the noble metals by a reducing agent; but, in combination with a base, it becomes itself a reducing agent. In combination with ammonia and metallic oxides it forms a numerous and interesting class of salts, called ammonio-citrates; and it is upon this fact that the plan is based of removing the objectionable metallic spots which sometimes occur in photographic paper by immersing the paper first in a solution of one part of citric acid to ten of water, and subsequently in water containing five per cent. of ordinary liquid ammonia, specific gravity 880.

Uses.—The principal demand for this preparation is among calico-printers: it is used also in pharmacy, and for domestic consumption. By the photographer it is employed in the free state and in combination, as citrate of soda. In the former condition it is introduced into developing solutions to moderate the reducing action of pyrogallic acid on the salts of silver: it should be remembered, however, that developers containing this acid are weaker in their reducing action than those prepared with acetic acid, and that the chief advantage to be derived from its employment arises from the fact that chemical reactions take place with greater energy at high temperatures, and the retarding action of this acid is therefore found especially useful in summer weather and in hot climates. Further information of a similar character has been given with reference to this acid, under the head of "Pyrogallic Acid," and to this the reader is referred. It may be mentioned for the guidance of the amateur abroad, who, being able only to obtain lemon juice, would be tempted to apply it in developing, that one drachm of good lemon juice is equal to three grains of solid crystallised citric acid. It should of course be carefully filtered from mucilage before use.

Impurities.—Citric acid will sometimes contain organic colouring matter, which would at once be indicated by its appearance. This, which may be called an accidental impurity (or at least one arising through the recrystallisation not having been carried far enough), is comparatively harmless. But the case becomes more serious when, as sometimes happens, tartaric acid and even alum are fraudulently mixed with the pure acid; for the former, which is the commonest mode of adulteration, materially affects its properties as a photographic agent.

Tests.—The presence of tartaric acid may be determined by adding to a solution of the suspected citric acid in water a solution of acetate of potash, which will occasion a precipitate of bitartrate of potash, if tartaric acid be present. In performing this experiment an immediate precipitate should not be looked for, unless the solutions be tolerably strong. A still more conclusive evidence of the existence of tartaric acid may be obtained by adding to a solution of the citric acid under examination hydrated oxide of iron to saturation, and to the solution thus obtained an excess of caustic potash. If the citric acid be pure the whole of the oxide of iron is again thrown down, and the supernatant liquor will be colourless: if, however, tartaric acid be present, oxide of iron will be held in solution, and the liquor will be coloured. The presence of alum may be inferred if a white insoluble ash remain after heating a crystal of the acid to bright redness, until the carbon first formed is dissipated by combustion. The combustion of the carbon may be aided by the admixture of a little red oxide of mercury. Finally, citric acid may be distinguished from most of the other vegetable acids by the effect produced, on the addition of lime water to its solution: the liquid remains clear until it is heated, and then becomes turbid, and deposits citrate of lime.

Effect of Internal Use.—This acid is used in medicine as a refrigerant and antiscorbutic. It is an efficient substitute for lemon juice, and is employed in making effervescing draughts.

Antidote.—So weak a vegetable acid as the one now under consideration is hardly likely to be taken in sufficient quantity to require the exhibition of an antidote. Should such a contingency, however, arise, the most suitable course to adopt would be to neutralise the acid by the administration of calcined magnesia, diffused through water.

ON PORTRAITS AND PORTRAITURE.

By S. Thompson.

Since the Greek maiden made the first essay in portrait painting by endeavouring to trace the shadow of her lover on the wall, portraiture has passed—in the centuries intervening that poetic myth and the photographic era—through many phases, styles, schools, and mannerisms. Scarcely less in number have been the media and pigments used. There were the illuminated missal, the statues, the coins, and gems of antiquity. Portraits have been, and are, painted in oil and water-colours, crayons, and other pigments—and now chemicals, with pencils of light, guided by hands that have not lost their cunning because they have changed their materials. The work, by whatever means, comes from within and not from without, and is the reflex of the artist's ideal. Then we have, beside, portraits painted in words as only the true artist can paint them. How Shakespeare painted them—beautiful creations that they were! And, in our own day, Tennyson as he only can paint them!—

"——rare, pale Margaret,
O sweet, pale Margaret!"

contrasted with fairy Lilian

"From beneath her gather'd dimple,
Glancing with black-beaded eyes."

How well he understands the immutable laws of *breadth*, *harmony*, and *contrast*—and employs them, too, as in "the Gardener's Daughter!"

"She stood—
A single stream of all her soft brown hair
Pour'd on one side: the shadow of the flowers
Stole all the golden gloss, and, wavering
Lovingly lower, trembled on her waist—
Ah! happy shade!—and still went wavering down—
* * * * *half* light, *half* shade,
She stood—a sight to make an old man young."

Line upon line—tint upon tint—word upon word—looking round which to choose; each adding one of those little fine touches which go to make perfection: trifles each, but, as a great sculptor once said, all necessary to make that perfection which is no trifle. Every stroke telling—clothing the dry bones with flesh and blood until they become a living, breathing reality. Yes! for, after all, the ideal is the only real: things that are seen and patent to the senses pass away and are not.

Then there are the various stages of mannerism through which portraiture has passed, when portraits were less portraits of people than portraits of satins and of laces and other frippery—huge collars supporting, most uncomfortably, little flat, unmeaning faces, like a small pip in the midst of an orange. Then there was the Hudson Bay phase, when people were robed with fur, and made to appear as if they had either just returned from, or were about to depart to, the North American colonies; the flowered dressing-gown and literary phase; the "broadcloth without" and full-bottomed wig phase; followed by many others more or less open to criticism. But, dress how you may, ye exquisites of the present generation! be sure posterity will have a laugh at costumes which great lapses of time will inevitably make appear absurd, uncouth, and ridiculous! Portraits, too, sometimes tell disagreeable tales. It was, we remember, once our fate to be a *particeps criminis* in reducing the red face and decidedly plebian look of a large portrait of a self-made wealthy and worthy manufacturer to a proper degree of gentility (albeit at the expense of the resemblance, which ought to have been most valued) for the dining-room of a more aristocratic but less worthy son. Portraits sometimes pass through many degradations—like cab-horses—ere they at last come to adorn the club-room of a costermonger's harmonic. There is a story told of an old lady who hit upon a happy device by which to avoid such sacrilege: the example is worth following. Her husband was the last of his race, for she had no children. She took all the family portraits out of their frames, rolled them all up, and put them in the coffin with the deceased. No one was more honourably accompanied to the grave—and so he slept with his fathers.

Not less numerous are the varieties of portrait*ees*, presenting quite a psychological study to the metaphysician Some persons

have quite a passion for sitting for their portraits—others an invincible repugnance; and these—often the most worthy—submitting to it as a kind of infliction incident to their position, to be endured with the same kind of philosophic resignation as that they would exhibit if compelled to accept the Koran and plurality of wives. There are others who are always excusing themselves to *themselves* for sitting. This is really through a proper feeling. No one would or should sit for a portrait for their own sakes. The fact of sitting implies something which should have a higher origin—in the region of the affections, or in private or public worth. Portraiture was reserved by the ancients as a mark of great honour. We are told they "used to cause those from whom the commonwealth had received extraordinary benefits, either in war or civil affairs, or for eminence in religion, to be represented in marble or metal, or in a picture, that the sight of them by those honours might be a spur to posterity to stimulate the same virtues. This honour was first begun with their deities; afterwards it was paid to heroes, and, of consequence, to philosophers, orators, religious men, and others, not only to perpetuate their virtues, but also to embalm their names and memories."

Portraits by photography are generally considered *uncertain*, which is not surprising when we consider how chameleon-like are the flitting aspects of the human face. A passing thought—an "airy nothing"—will throw a shadow over the countenance at the critical moment and alter the whole expression. Then there are always particular aspects under which *those at home* like you best, which may not have been caught. Sitters should always remember that the photographer cannot, like the painter, work up a particular expression; and yet it is in those happy, evanescent gleams of individuality of expression that photography is so great—far outstripping the most gifted pencil of the loftiest genius.

We have not the temerity to offer advice "how to sit," but an old writer on art has so well counselled how *not* to sit that we willingly re-enumerate his *non*-poses:—"Don't, in your horror of a sentimental, amiable look, put on yourself the air of a Diogenes, or you will be like nothing human. Don't put your hand into your waistcoat, and one arm a-kimbo, like a Captain Macheath. Don't look up like a martyr, which some wonderfully affect; and don't turn your head round as if in disgust with the body. Don't put your arm up as in command, or accompanied with a rapt look as if you were listening to the music of the spheres. Don't thrust out your foot conspicuously as if you meant to advertise the blacking. Don't allow the artist to put you in any fancy attitudes. If you are *invariably* not pleasant-looking don't try to appear so, because your portrait might be so unlike no one would know it, more particularly if you have not the facial flexibility of Garrick, who sat *incognito* to a painter several times, each time making up a different face, until at last, the painter, foiled in every attempt, threw down his pencils and said—'You must be Garrick or the d——l!' Don't have a roll in your hand—that always signifies a member of parliament. Don't have a finger on a book—that would be pedantry. I don't know what you will do with your hands, but don't put them into your pockets, or you lay yourself open to the criticism once passed on an attorney who, from humble pretensions, had made a good deal of money, and enlarged thereby his possessions, but somehow or other had not very much enlarged his respectability. To his pretensions was added that of having his portrait put up in the parlour, as large as life. There it is, very flashy and very true—one hand in his breast, the other in his small-clothes pocket. It is market day: the country clients are called in: opinions are passed, the family present, and all complimentary—such as—'Never saw such a likeness in the course of all my born days!' 'As like 'un as he can stare!' 'Well, sure enough, there he is!" But at last there is one dissentient—''Taint like—not very—no, 'taint!' said a heavy middle-aged farmer, with rather a dry look, too, about his mouth, and a moist one at the corner of his eye, and who knew the attorney well. All were upon him. 'Not like!—how not like? Say where it is not like?' 'Why, don't you see,' said the man, 'he's got his hand in his breeches pocket: it would be as like again if he had his hand in any other body's pocket!'"

England has always liberally patronised portraiture. This is the land where exotic and native portraitists have alike flourished. Vandyke, Lely, and Holbein—to whom Henry VIII. made one of his nobles apologise for some slight, bidding him to know that he could make a hundred such as he, but it was past his power to make a Holbein.

It is curious to reflect how little in past ages mankind knew of their contemporaries. The form and features of many of those who "moved the world" were as utterly unknown to those who lived in the same period as they are to us. The men of mark of our own age are as familiar to us as "household words." We have really no idea of what our race was like before the time of the Reformation. What we see could not possibly be "likenesses," because they simply are not humanity. Not until Holbein's time did we begin to see what men and women were. What our early Henrys and Edwards were—what the Court and the people were like—we cannot know: they are buried in the night of art, like the brave who lived before the time of Agamemnon.

We sometimes hear people question whether portraits by photography will continue to be as popular as they now are. We might as reasonably ask whether railways will continue to be popular, and whether we shall not go back to the slow coaching days. Photography ministers to a want deeply rooted in our nature. So long as the affections and passions last, it must be popular: so long as people marry and are given in marriage—so long as friendship, love, heroism, genius, and goodness are attributes of humanity—so long will there be a demand for the fruits of photography.

Kingsley has recently very forcibly asserted that "individual character wonderfully sways the affairs of nations." This unquestionable fact raises the study of portraits from artistic to social importance. The latent capabilities and applications of photography are as yet scarcely felt. Photography *has* a mission, and that unquestionably a high one.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. XI.

The topic which I purpose attempting to elucidate herein is the very disagreeable, offensive appearances existing in almost all photographic views which include *distance:* I mean that blank, *flat*, misty indistinctness which usurps the place of *distance*. The obnoxious effects resulting from the internal repeated reflections from the surfaces of lenses, particularly when those surfaces are numerous; and the fogging of those parts of pictures having weak light, or in shade, arising from other parts having strong light. A like effect also produced by strong actinic colours in certain positions being reflected in such a manner that a portion impinges on parts which represent colours of weak actinic power; and, further, when there is a certain amount of mist or condensed vapour in the air, it is much more opaque in the picture than it appears in the actual view.

I believe it will not be disputed that, as a rule, the foreground and near objects seem to stand out well and satisfactorily when the views have been taken with a strong light and clear atmosphere; and yet under the same favourable circumstances the *distance* is not rendered with that distinctness which is highly appreciated by the public, and which assists very materially in selling a picture, whatever artists may think of its artistic properties. The public admire pictures which are natural—which represent nature truthfully; and so do I. Give me a picture in which I can see the most distant object with the same distinctness as I can see the object itself with the naked eye, under the conditions which are supposed to be represented. Let us have no *blank wall* of mist hiding the distance, and call *that* atmospheric effect, aërial perspective, &c., but a representation of space, of distance, of that wide expanse bounded by celestial endlessness. If the object be to represent a mist, whether it be a dense or light vapouring one, so be it. Misty pictures are not admired. People turn away from them with distaste. Even a pretty winter view, if cut short by a pall of mist, will be passed by to admire a snow-clad scene taken on a clear day, including distance. But the difficulty with photography is to picture truly matters as they are, and perhaps there is no greater in the art than taking a view when there is some mist in the air, and representing *that* truly; for the mischief is that a light mist is converted into a thick one, and a thick or strong one into a dense, impenetrable fog, which completely shuts out the distance, and thus deprives one of the pleasure of examining numerous objects in the landscape, in consequence of which we turn from the picture with disappointment.

Now, as this is a very grave evil, and one almost universally present in views, it becomes a question of the first importance to discover the cause or causes, and, if possible, propound a remedy. The chief cause of the *mistiness of the distance* being more intense in a picture than what it ought to be, or than what it appears in the real view, I ascribe to the *colour* of the mist or vapour. I say, in consequence of mist being white it will make an impression or

picture of itself (if picture it can be called) on a plate in a much shorter time than dark-coloured objects on the same plate; and if the exposure be continued long enough for the image of dark-coloured objects to be sufficiently impressed, then the action of the white mist will have been so strong or accumulated as to obscure or almost blot out the distant objects which should be seen through that mist. As an argument in support of this, let us suppose there are two objects to be photographed—one a white house, the other an old dark brick building, both equally distant from the camera, and, of course, illumined by the same light. Now every photographer knows that a picture of the white house, with perfect detail, could be obtained in a time so short that, with an equal exposure, an impression of the dark building would scarcely be visible at all; but if the exposure were increased enough for the dark building, then a great portion of the detail of the white house would be blurred up or blotted out. Such, similarly, is the action of mist. These effects or conditions would be more remarkable with a weak light than a strong one—in fact, I can conceive a light so weak that with a long exposure I could obtain a picture of the white house, but no amount of exposure would bring the dark building out; therefore, on the other hand, a strong diffused light must give the most perfect picture of all objects, whether light, dark, or coloured.

There is another matter to be taken into account here in relation to the action of light—namely, the apparent *continually increasing* power from a light-coloured or strongly-illumined object over that from a weakly-lighted object, or one in the shade, *during the time of exposure*. If, with the two objects above-named, I assert that the action of the light from the white house, during a certain exposure, increases in geometrical ratio, while that from the dark building increases in arithmetical ratio only, perhaps I may not be far wrong; and, if so, I think it may fairly be inferred that the nearer pictures can be taken instantaneously the more correct will be the result as regards representing the lights and shadows truly. I do not mean to say that the power of the light itself increases according to the above mathematical proportions, but that the results of its continued action on the chemical film amount to such effects, or, in other words, that the decomposition, deposition, deoxidation, or whatever else it may be called, occurring on those parts of the film on which the strongest lights fall, is effected in a shorter time than suffices for the weaker lights. Thus in all cases when there are violent contrasts of lights and shadows, the quicker the picture is struck the better; and, whatever can be done to contribute to the same end in the qualities or compounding of the chemicals, ought not to be lost sight of.

With respect to the remedies or means of preventing or avoiding the above mischiefs, I have already indicated one, namely, to take views with as short an exposure as possible, and also to take advantage of a good light. If at any time these favourable conditions cannot be obtained, there is nothing for it but to wait until they can be secured. The same precautions apply in getting a clear distance in addition to a clear atmosphere; for it is spoiled work, and a waste of time and material, to take pictures when there is much mist in the air or a weak light, because it is beyond our power to increase the latter or remove the former.

Photography, like all other human inventions, has its imperfections and difficulties, and one of its greatest defects is its inability to depict coloured objects satisfactorily, especially when the colours are numerous and of violent contrasts, photographically speaking. See what a simple skeleton-looking thing a photograph of a beautiful many-coloured bouquet is! It is not merely the want of colours, but the obnoxious contrasts between certain colours—some being much overdone, with their details blotted up; others underdone, with the details not visible. How different, how much more exquisitely pleasing, when the fibres, yea, the very filaments on the flowers and leaves, can be delineated to satisfaction! So with a portrait. How vastly superior when the dark portions of the dress are up, and yet the lighter parts showing the detail, the thread, the very material of which the article is composed! These same observations will bear on the case of taking materials the surfaces of which are bright or highly reflecting.

I have always considered that there is a great similarity between taking a view including distance and a bunch of flowers of many colours—that is, in so far as relates to the contrasts; but, in the view, there is, besides the contrasts in colours, the contrasts of high lights and weak ones, and also the highly actinic-coloured mist, if such be present. Now, as we cannot change the colour or remove the mist, the next best thing we can do is to take the opportunity of having a perfectly clear atmosphere, for, even in that case, there will be plenty of what may be taken as mist; but, if a view has to be taken when there is mist, it ought to be done when there is sunshine or powerful light.

HINTS ON THE NATURE OF PICTORIAL BEAUTY AND THE PRINCIPLES OF COMPOSITION.*

By W. H. Davies.

No. I.

In grouping figures it may be taken as an axiom that it is more difficult to group two figures than either one or three: when there are more than three, the task becomes more difficult the greater the number of figures to be dealt with. It is here that a knowledge of the lines of arrangement, a sense of pictorial beauty, and the skill of the artist in applying the knowledge is called into play; for the camera and the sensitised plate is not like the palette and brush, that can go leisurely about the matter and blot out a bad line and substitute another and a better, or skilfully help the inadvertance of a sitter, and in many ways improve the effect by adding to, or taking from, portions that may not be sufficiently picturesque or that spoil the general arrangement. The photographer must do these things at once; and, before beginning to impress the image on his tablet, he must have the whole effect in his mind, or, better still, have it roughly sketched: then, having found he must do it, do it at once. Fortunately he has this in his favour, the accidental arrangements which groups take are often better than could be devised impromptu, inasmuch as they bear the stamp of naturalness and unstudied ease, and, as such, are better than the most studied art, unless the art be well concealed; for nothing annoys the gazer so much as to see the hand that moves the puppets.

From the arrangement of one figure to that of two the transition is easy on paper, although not so in portraiture: the difficulties increase rather in a geometrical than in an arithmetical ratio, and the chances of success are correspondingly diminished. In the composition of a fancy group the artist-operator can follow out his own idea of the method of arranging the figures; but it does not always happen that professionals can do so with their sitters, who will often perversely insist on being taken in a particular way, whatever protest the photographer may make to the contrary—so that we must be careful to avoid crediting him with all the horrid things one sees on glass and paper, as they must often do them to the order of their clients, unless, indeed, they prefer being without such orders, and show to the world the sublime spectacle of a voluntary commercial failure at the shrine of artistic success.

Among the examples of subjects with two figures I have, unfortunately, been unable to secure a sufficient number of choice examples; but some of them are very perfect. I should have liked to have had some of Frank Stone's best compositions, as they are very fine, and he has been exceedingly successful with two-figure pictures. This of Ary Scheffer's—*Mignon and her Father*—is one of his best, and is a fine example of sentiment, expression, and arrangement, as the two companion ones of *Mignon Aspirant de Ciel* and *Mignon Regrettant la Patrie* are of single figures. His *Dante and Beatrice* also is well worthy of study. This of the *Morning Ablution* is a little gem, and perfectly photographic. If we turn to the sculptors for a lesson, Foley's *Ino and Bacchus* will afford us a good one: it is exceedingly good and very graceful, and the posture, though uncommon in portraiture, is one not at all difficult to execute in photography. A sofa is neither an unusual nor an ungraceful object; and just suppose the semi-nude *Ino* to be clothed, and lying on the sofa, toying and playing with the child, and you will have conceived of a very complete little picture. In all of these subjects, and in most of those I see around which I do not speak about, there is always some action in the figures—something they are doing—thus fulfilling the first requisite of good composition. But of how many photographs can you say the same thing? Look round the specimens brought together from various quarters and judge, for they are fairly selected. It may be said that, in advising you to use the known productions of the great men in painting and sculpture as the basis of your own compositions, I am counselling a kind of wholesale annexation of their ideas; but if we are to take the artists themselves to judge us we will not find many to condemn—in fact all of them who have taught in the matter have advised their scholars to adapt the forms and spirit of the best examples to which they have access to their own purposes, allowing it to be a very venial offence indeed.

* Continued from page 3.

Those who are in the habit of studying the pictures in the various exhibitions, if they have the analytic faculty and a memory, will see dozens of pictures all referable to the same type, although far from being considered copies by the artists themselves or by the hanging committee. *Apropos* to this subject an artist-friend of mine has told me how he got a suggestion from Raffaele's cartoon of *Christ's Charge to Peter* for the arrangement of an Irish funeral. The half-frantic Irish woman kneeling by the side of the grave was Peter; the parish priest was made to take the place of Christ; and the audience and tombstones were supplied by the rest of the picture. He had seen the scene itself, but the pictorial application of it was suggested by this cartoon, which, as you see, by a change of costume is easily adaptable to such a subject.

But as I must have nearly exhausted your patience, I will go no farther with my illustrations tonight, and will reserve the consideration of subjects with more than two figures, and also the other principles which have yet to be treated, for another opportunity. Meanwhile, I will conclude with Haydon's analysis of the cartoon I have referred to, in order to show how fully and accurately a picture can be described and the composition dissected, so as to show the use and value of every figure and almost every line, and because you can have no higher examples than those cartoons: they are standard, and Haydon may be accepted as a first-rate authority on this matter. He says:—"In the hands of an ordinary painter what could be done with *Feed my Sheep?* Could any man have believed that without the graces of woman any subject could have been made so delightful as Raffaele has done this? What it wants in variety of character, as to sex and age, he has supplied by exhibiting the various ways in which different temperaments are affected by the same thing—what in picturesque variety of dress by infinite variations of the same dress affected by variety of action, which is the result of different sensations acting on the figure, and by harmony of colour; and by arrangement he has made it very little less full of attraction than any other of the cartoons. Christ is the first figure which attracts notice, standing in an unaffected and simple manner—not resting on one leg, and throwing the whole behind like the eternal action of the run of antique statues, but as all men stand when they are not standing to be seen, and only as their convenience or ease induces them. His expression has a mixture of melancholy and pathos, beautifully touching: it is the finest head of Christ in all the cartoons. He is pointing to a flock of sheep, indicative of the text, and to the keys in Peter's hand as connecting him with the Catholic church—St. Peter being the head of it. St. Peter is on his knees, watching with eagerness the looks of his Divine Master, and listening with an inquiring submission to the utterance of His will. St. John presses forward full of anxiety and affection—his hands up as if in adoration—his nose, eye, and mouth, action and expression, denoting regard as lively and as delicate as the soul of the painter who conceived and painted him.

"Though Raffaele's St. Johns are built on the St. Johns of all the great painters, from Cimabue downwards, yet Raffaele added a beauty they all missed, and which would have rendered all representation of him incomplete without this addition. He seems to say:—'Do not think that I have less love of thee than another: believe me as intensely devoted, O! Divine Master, as the apostle to whom thou hast committed this charge.' Another, by his side, seems to lift his hands in rather envious astonishment. The one behind is rather pressing forward towards Christ with affection: the next turns round to his companions with simple wonder and inquiry, and, without speaking, looks with a scrutinising vigour first to ascertain what the other thinks by his air, and before he ventures an opinion; while the other, with graceful simplicity, is holding his robe, and expressing also surprise, but mingled with pleasure. The one immediately behind this last is too far off to comprehend or hear exactly what is passing, and, with his head half dropped, he seems in a breathless mixture of half eye half ear to make out, as well as he can, what is happening in front: he is so placed that he could see Jesus between the heads of the others, but is scarcely near enough to hear. Of the remaining three the hair only of one is seen, and the faces of the other two denote no particular emotion. This skilfully exhibits the interest—dying away, as it were, the further it is removed from the cause of excitement.

"By studying carefully the figure of Christ as a composition, immense knowledge may be gained to all: it is a fine example of management, so as to prevent a single figure coming flatly and meagrely on its background.

"On the left side we see how rich and full it is by the great variety of shapes produced by the folds of the drapery: then comes part of a sheep feeding, and then some weeds, while a creek running in from the lake crosses the left hand at the thumb joint; and, again, the other line of the creek goes from the inside of the elbow to the drapery. All these produce a variety of quantities as to shape and figure, breaks the meagre line of a naked arm, and takes off the perpendicular and angular ending of contour which the drapery of Christ on this side would produce.

"On the other side of the right hand issues a mass of broad drapery, and the flock of sheep by their heads and bodies break the uniformity of shape which there would be if it had nothing but a flat surface. This is what is called supporting a figure—preventing it rising abruptly out of the background, which would be the case were there nothing between the figure and the distant objects."

STEREOGRAPHS.

An Artist's Gatherings in Cornwall, Devon, and the West of England. Photographed by George Wilson, *Aberdeen.*

During the season of 1861 one of our most renowned artist-photographers, Mr. George Wilson, selected for his sketching-ground the southernmost district of the island, probably as a contrast to the (to him) more familiar but not less beautiful sections of Great Britain, comprising the Scottish Highlands. In calling it a "sketching-ground" we have perhaps employed a term scarcely appropriate in connexion with Mr. Wilson's productions, which are rather finished pictures than sketches, the only thing in common between the two being their rapidity of execution; but we scarcely know what expression we could use that would be more definitive, unless indeed we were to call it his *al-fresco* studio. However, whatever may be the proper designation of the place of temporary sojourn for artistic purposes, the results of the artist's labours are more to our present purpose, and we propose describing some of those which are now before us.

The Land's End (No. 311) is as interesting in an artistic point of view as it is in a sentimental one. The broken columnar point of rock, stretching far away into the ocean, with its smaller detached masses forming Liliputian islets bathed with eddying waters and foaming surf, and the rough angular points sharply defined, contrast beautifully with the gently-rounded undulating wavelets of the ocean melting gradually into the far-off horizon, indicated rather than seen through the naturally moist atmosphere. Those who deny to photography its capability of rendering atmospheric perspective have only to look upon this subject to become convinced that their notions are erroneous.

The Logan Stone (No. 309) is interesting rather as the representation of a natural curiosity than as a picture; but

The Cheesewring (No. 307), though at least equally curious, presents far more of the picturesque. There are three views of this singular natural cairn of stones, consisting of some eight or nine huge rounded masses piled one upon another, the largest being at the top. The stunted herbage and lichen-covered rocks add much to the effect, and still more the introduction (in that marked A) of a couple of figures seated under the overhanging stones of the Cheesewring, one of them, with extended arm, pointing out to his companion something in the far distance.

Of The Viaduct on the Cornwall Railway *at Saltash* (Nos. 305 and 306), one view is taken from the shore, the other from the river. Both will be valued by engineers as records of the skill of Sir I. K. Brunel. During the construction of the work the late Mr. Robert Howlett was employed to photograph the same in order to retain accurate representations of its progress, and we accompanied him to Plymouth on the last occasion of his visiting the spot for that purpose, shortly prior to the time of his death. Perhaps this is the reason we take an interest in the subject now before us, as we must admit that there is not much room for the display of high artistic skill in its delineation.

What a contrast with the preceding is there in the next slide we have to notice! for, though only that very matter-of-fact object—a vessel of war in harbour—Mr. Wilson has converted it into a charming picture, whether viewed in or out of the stereoscope. H. M. Ship "Impregnable," 104 Guns, *Guardship in Hamoaze* (No. 313), is seen through a vista in the branches of an oak tree, the towering hull and stately masts being faintly reflected in the water; and the background of low hills in the far distance and the building sheds of the dockyard on the right are in good keeping—some smaller craft, especially a barque with very raking masts, acting as foils to display the huge proportions of the man-of-war. A very excellent picture is also the same vessel as shown in an another slide (No. 313 A), without

the framework of foliage, but wherein is a small sailing boat violently rocked by the wavelets, the huge vessel lying tranquil and stately.

Whilst on nautical subjects, we cannot forbear noticing (Nos. 316 and 317) GREAT-GUN PRACTICE on board *H.M.S. "Cambridge," in Hamoaze.* In the former, the mirror-like surface of the water has been just ruffled by the concussion of the air caused by the explosion of a single gun, the white smoke from which, in rolling rounded masses, has been delineated with perfect truthfulness—the reflection of the vessel in the water, with her bare masts and rigging, being grotesquely contorted, and rendered with charming accuracy, while the reflected light from the sky, glancing under the vessel's stern, adds much to the effect as a work of art. No. 317 is a representation of the same vessel firing a broadside, and taken from a point more towards the stern: the very different effect produced upon the water in this as compared with the former subject is worthy of remark. There are several other capital illustrations of marine subjects; but we can only spare space for the description of one more containing views of the "SHELDRAKE" AND "CHARON" GUNBOATS *in Hamoaze, with* KEYHAM STEAM-YARD *in the distance* (No. 325). This is a capital slide. The water and gunboats in the foreground, the long low workshops and steam chimneys in the far middle distance, backed by the rounded hills with scattered buildings, and adorned with a sky shrouded in natural clouds, combining to make up a very fine picture.

THE CATHEDRAL AT EXETER has been well illustrated. THE WEST FRONT being represented in No. 295, showing the beautiful mass of figures which adorn it, though they would be more correctly described by calling it a "view of the Cathedral from the west." No. 300 is a representation on a larger scale of THE GREAT WEST DOOR, including also about fifteen or sixteen of the surrounding figures in *alto relievo* (alas! that it should be so), sadly mutilated by the corroding hand of Time. One-half of the massive iron door is partially opened, showing a glimpse of the interior, which, however, is scarcely discernible except it be viewed in the stereoscope.

A fine view of THE CHOIR OF EXETER CATHEDRAL is depicted in No. 297, showing well the magnificent stained-glass window and beautifully carved oak canopy of the Bishop's throne. No. 296 is a view of the choir from the east end, showing, in addition to the throne, the carved canopy of the pulpit, and, instead of the east window, the organ occupies the central position, while the whole extent of the splendid roof, over both choir and nave, stretches in long perspective to the west window, a fragmentary portion of which is visible by the side of the organ. A view of THE NAVE, LOOKING EAST (No. 298), is nearly the converse of the preceding; but though without some of the interesting features of the previous slide, their absence is to some extent balanced by a fine chequering beam of sunlight falling upon the screen.

Want of space compels us to postpone to another opportunity the notice of many others of Mr. Wilson's recent productions; but before closing the present one, while upon Cathedral interiors, we may appropriately make mention of two taken from GLOUCESTER CATHEDRAL, which must not be passed over. The first to which we allude (No. 301) is the representation of an extraordinarily-fine painted window. This is seen between two rows of plain cylindrical columns, united by semicircular arches, which, without presenting any architectural beauty, are important elements in the pictorial composition, and assist materially in giving value to the play of light and shade.

No. 304 exhibits, in fine perspective, the beautifully-carved roof of THE CLOISTERS OF GLOUCESTER CATHEDRAL, the pavement chequered with sunlight streaming in through the embrasures on the right hand, lighting up the roof well by its radiation, the culminating focus of the long perspective being well defined by a dark corner pierced by a small window, each forming an appropriate, though not violent, contrast to the immediate surroundings; but, dark as the corner is, it is full of detail. This is a fine combination of contrast and harmonious subordination of parts, and the slide will, unquestionably, be a favourite both with the novice and the amateur.

Fine as Mr. Wilson's "interiors" have always been since we have had the pleasure of being acquainted with them, he appears to us every succeeding season to acquire increased skill in their delineation. We are always fond of rambling through the mazes of our old Cathedrals whenever we have a chance of doing so; and we cannot but linger with much gratification over such representations of their familiar scenes as those now before us.

THE PRINCIPLE OF THE DIORAMA APPLIED TO PHOTOGRAPHIC PICTURES.

WE extract the following from the *Glasgow Daily Herald*:—

"Within the last day or two we have had the pleasure of inspecting a highly interesting invention of our townsman, Dr. Taylor, of the Andersonian University, by means of which the principle of the diorama has been applied for the first time to photographic pictures. Photography produces pictures admirably perfect in the form and proportions of their objects, and unapproachable in truthful accuracy by any other species of art. To give the charm of colour, and of changing light and shade with the varied hues of morning, noonday, evening, or moonlight, along with the fidelity of the photograph, seemed to be all that was requisite in order greatly to increase the gratification derivable from the inspection of such pictures. The translucency of photographs on glass fits them in a greater degree than any other species of pictures for taking on in a truthful manner changes of hue and shade by transmitted light; even the deepest shadows, from their semi-transparency, being capable of being affected in their hue by the general change of colour of the light. Dr. Taylor's principle and its application possess the merit of extreme simplicity; and considering the sudden and rapid development of photographic art, it is somewhat astonishing that nobody had previously alighted upon this secret. The Doctor's problem was not merely to colour the photographic plate—not merely to produce successive transitions of colouring before the eye of the spectator, but to produce even the movement of clouds. This, we can say from what we have witnessed, has been successfully accomplished. The apparatus consists of an ordinary cosmoramic box, with a slide in the one side of it, for holding the picture, and with lenses on the opposite side, properly placed, through which the spectator looks at the picture. The pictures are carefully dimmed, or rendered slightly opaque in the light, to prevent the motion and forms of objects behind from being too distinctly seen through them, and a little delicate and appropriate colour is painted on the opposite side of the glass. The chief modification and change of colour and shade are produced by the motion of a coloured surface placed behind the picture, and strongly illuminated by a row of gas-burners, the light from which is kept from directly reaching the picture. This surface, on which the clouds and bands of graduated colour and shade are painted, is stretched round a light frame of wood, so as to give it a cylindrical or drum shape. The drum is about five feet in diameter, and is suspended by a cord from the roof. It is kept by the band, or by means of some appropriate machinery, in a state of slow rotation, so as to bring the differently coloured and shaded portions successively opposite the pictures. The drum is placed at a distance of about nine inches from the picture; and the differences of distance between the lens and the drum contribute much to the beauty of the aërial effects. By this simple appliance wonderful results are produced. Whatever perspective exists in a picture is brought out in a manner that the ordinary methods of painting need scarcely hope to equal, and every object bulks out from the picture with such completeness that one feels he could take a hold of it. It is scarcely to be doubted that this simple appliance, which could be easily fitted up, so as to be both portable and elegant, will yet be so mechanised, or arranged, as to become an agreeable means of enjoyment in many private families. It is right to say that Dr. Taylor has been ably and indefatigably seconded in his labours by Mr. Macnab, photographer, West Nile Street, who printed and prepared some of the plates, and in whose premises we had the pleasure of inspecting the apparatus. The actual measurement of some of the plates which we saw was 15 inches by 12: the magnified size, as viewed through the lens, was of course much greater.

"Dr. Taylor suggests that the same mode of viewing stereoscopic pictures in glass, by means of a moving coloured background, might be followed, as it adds greatly to their effect. In this case a flat disc, turning on its centre, and laid flat on a table, seems to be the best form for use. The usual obscure glass used to cover the stereoscopic picture must be removed, and a transparent glass, slightly dimmed, put in its place. Much of the beauty of the effect depends, as a matter of course, on the manner in which the bands of colour and shade are arranged on the disc."

The principle of the idea carried out by Dr. Taylor has of course occurred to several scientific photographers, and been adapted to various modifications of transparent slides. We ourselves proposed to Messrs. Negretti and Zambra the use of coloured glass for the suggestion of colour in the transparent photographs used last year at the Crystal Palace for the dissolving views—the glasses we contrived being painted in transparent colours, arranged in various modes, and were to be placed at some distance behind the slides, between them and the condenser. The idea of moving clouds had, however, not occurred to us. We notice that at the Polytechnic Institution (London) photographs of American scenery, by Mr. W. England, are being exhibited during the Christmas holidays amongst the dissolving views; and it is not improbable that this feature of suggesting colour may be introduced there also, as we were recently pointing out to him the advantage of this addition.

THE TANNIN PROCESS.

By Major Russell.

CHAPTER IV.

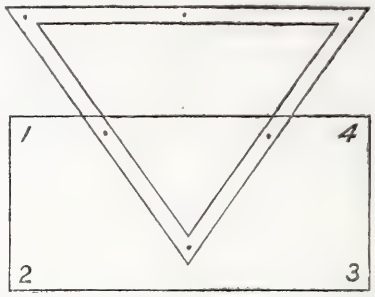
[*By the special permission of the Author we reproduce the following.*]

Commercial tannin appears to be very uniform in its action, but some samples contain more insoluble resinous matter than others. This impurity is not injurious, but it increases the difficulty of preparing and filtering the liquid. The solution may be of any strength, from ten grains to thirty grains to the ounce of water, and within these limits will give good results with any kind of subject. The stronger the solution, however, in the case of a sensitive and newly iodised collodion, the redder the image at the commencement of development, and the richer and more vigorous the picture—especially so when the subject is badly lighted. If the plate is to be used for a landscape containing dark foliage and sky in a good light, or for any other kind of subject which gives great contrast of light and shade, a strong solution of tannin on a new and sensitive collodion causes a development so energetic and rapid as to be rather difficult to control. It will therefore perhaps be better in such cases not to exceed fifteen grains of tannin to the ounce, and not to use a very freshly iodised collodion—at any rate until some familiarity with the process has been gained, especially as regards the management of the development. If less than ten grains to the ounce be used on a sensitive collodion, the image is apt to be feeble and slow of development. The strength of the tannin solution within the above limits does not perceptibly affect the adhesion of the film to the glass when gelatine has been used.

Weigh out a quantity of tannin sufficient to fill three common one-ounce, two-ounce, or three-ounce phials with solution of the strength preferred. The third bottle may be larger than the others, to avoid the trouble of often making fresh solution. Mix the tannin with the quantity required of distilled water in a glass vessel, stirring with a glass rod until dissolved. If much resinous matter be present it will, with entangled tannin, form glutinous lumps which require some time and much stirring to break up. Should but little resin be present, the solution will be complete in a few minutes, when the liquid is to be filtered through paper. The rapidity of filtering likewise varies with the amount of resin present: should the filter become clogged, pour back the solution into a glass, and change the paper. After being once or twice filtered no further trouble will be given in the same way. Pour into the bottles, and number 1, 2, and 3; add half a drachm of alcohol to the ounce in 1 and 2, and one drachm to the ounce in 3. The use of the alcohol is to preserve the tannin solution, and to enable it to penetrate the collodion film more readily; if the alcohol were added before filtering it would dissolve much of the resin, which would be gradually precipitated by the evaporation of the alcohol, and be always clogging the filters.

Take two glass measures and place in each a small gutta-percha funnel containing a fresh filtering paper; pour the contents of No. 1 into one, and No. 2 into the other. Place three levelling stands side by side: lift the end of the first excited plate with a silver hook (or, which will do as well, with a piece of stick having a sharp-ended foot nearly at right angles made by cutting off where a small branch comes out), and when the end is out of the water take the plate up with the fingers and place it on a pneumatic holder. Wash under a tap for a few seconds to remove any dust on the surface. Sensitive plates are often spoiled in this operation by dirty water splashed from the sink. To avoid this, tilt up under the tap a large plate of glass, or a piece of board or slate, or a porcelain dish upside down, at an angle of 30° to 45°.

Rinse the film with a little distilled water to remove the saline matters of the common water, and to prevent their being mixed with the tannin solution; then, if the plate be small, incline it so that the end at which the collodion left the plate is uppermost, take hold of the two corners of this end with the right hand covered with a clean cloth, detach the holder and wipe the back slightly with the left hand, then, shifting it under a dry part of the cloth, take hold of the two lower corners, and wipe again with the right hand. The draining and wiping will take about half a minute. The object of wiping the back is not only to prevent dilution of the tannin solution, but also to prevent water coming into contact with the points of the levelling stand, and then carrying impurities into the tannin solution. The object of covering the hands with the cloth is to prevent water which has touched the fingers from running on the sensitive surface, and also to avoid making the film surface dry by the warmth of the hand, as this would impede the flow of the tannin solution. Take by the same corners as before with the right hand; these will now be surface dry, so the fingers need not be covered by the cloth. Place on the left hand levelling stand, and pour some of the solution No. 1. on the right-hand end of the plate, taking care to leave the extreme corners 3 and 4 dry, that the solution may not come in contact with the fingers.



The corners are here numbered the same as in the cut, at page 306, and the gelatine and collodion are both supposed to have been drained at 3.

Should the edges have become too dry to allow the solution to flow on them, pour a little into the funnel, and, while dripping, carry along the dry parts with the nose just clear of the surface. Bubbles are not easily formed by the liquid, and if formed, break immediately. Replace the funnel in the glass and hold in the left hand; take the plate by corners 3 and 4 with the right hand, and tilt so as to drive all remaining moisture before it into the funnel from corner 2. Then pour on and off in the same manner some of solution No. 2; pour on again and let it remain until the next two plates have been treated in the same manner on the two other stands. This way of working will give ample time for the solution to penetrate the film, without causing any loss of time.

Should the glasses be large, after rinsing with distilled water, hold the plate vertically, with corner 2 downwards, and wipe the back round the holder slightly; then take by corner 2 with the left hand, covered with the cloth, the angle resting on the thumb, the back supported by the fingers, and the plate in a nearly vertical position over the hand; remove the holder, and wipe again with the right hand. Corner 4 is to be kept dry, since by lifting it the solution is poured off at corner 2, which is the most convenient way of working. The wiping cloth should be of cotton, and, if used for this purpose only, will remain sufficiently clean for a long time. When three plates have been covered with tannin solution, pour off the first, when the surface will show oily lines from the alcohol: these are of no consequence. Pour on and off once more. Attach the pneumatic holder, and, when the solution has nearly ceased to drip, set the plate upon filtering paper on the draining stand on corner 1: by draining on this corner the solution is prevented from leaving those edges of the film which are most apt to repel it, and at the same time a somewhat thicker coat of tannin is formed on that part of the plate where the collodion film is thinnest. This state of things is favourable to uniform intensity of development.

Cover another plate with tannin in the same manner on the levelling stand, then drain the next, and so on till all are set up to dry. In using tannin solution always pour from the plate into the filtering funnel, which is to be kept in the glass measure, except when pouring on, when it is to be held in the left hand over the plate. This involves no trouble or delay, as the liquid filters through quite as fast as it can be used, and in this way dust is prevented from accumulating in it. When a number of plates have been prepared fill up No. 1 from No. 2, and No. 2 from No. 3: by this means dilution to any extent is avoided.

The glass measures and funnels never require washing, and the filtering papers need only be changed when they work too slowly. The solution may be returned to the bottles after use, as it does not appear to be at all injured when the plates are entirely free from nitrate of silver; and this should always be the case, since the presence of nitrate often causes stains, and the sensitiveness of the plates, if dry, is not thereby increased—at any rate when the collodion contains a sufficient amount of bromide.

The tannin solution sometimes becomes mouldy if kept, particularly when the alcohol has been nearly removed by evaporation from frequent use. A drop of oil of cloves in each bottle entirely prevents this tendency, and does not seem to produce any injurious effect, unless undissolved globules of the oil are poured upon the film. All chance of such globules may be avoided by allowing the oil to remain at the bottom of the bottle, which is never to be quite emptied, and by taking care not to apply the solution to the sensitive surface without previous filtration. Undissolved globules

of oil, if poured on with the solution, will adhere to the film, and produce transparent spots of insensitiveness. A quantity of strong solution of tannin, which became very mouldy about four years ago, and to which oil of cloves was then added, settled quite clear, and has remained in the same state ever since, and, although dark in colour, gives as good results as the freshly prepared solution.

The plates, after being coated with tannin, should be left to dry spontaneously at a moderate temperature, rather than by artificial heat. In the case of the gelatine process, and most other dry processes in which the nitrate of silver is entirely removed, drying strongly by heat is favourable to sensitiveness; but plates prepared with tannin appear to be exceptional, their sensitiveness being increased by drying up to a certain point, and beyond that being diminished again. The amount of dryness which appears to be most favourable is about that which the film will attain spontaneously in the ordinary state of the air. It is evident from the above that, however dried, the film should be *uniformly* dry when exposed. Another objection to drying at a high temperature is, that it renders the film more liable to loosen from the glass when moistened for development. On the other hand, if the film be exposed when in too moist a state the definition of the image will be found to be injured. Great care should be taken not to expose the plates to light whilst drying, as even the light from a dull fire will soon injure them. Access of dust to the film whilst moist should also be carefully guarded against; but, when the plates are dry, this point is of little consequence, as the surface will bear wiping.

The plates, when dry, may be kept in the way recommended for the gelatinised glasses; but they must, of course, be well protected from light as well as from damp. The quicklime will scarcely be required, as the surface, when coated with tannin, does not, if moderately dry, appear to be liable to become mouldy. If the lime be used, the plates should be placed in the slides a few hours before exposure, that they may absorb a very small degree of moisture from the air. The writer has not found the plates at all deteriorated by keeping; but he has not tested them beyond a month before exposure, and six weeks after exposure, but before development. Whether the gelatine will diminish the keeping quality of the plates, especially in hot weather, by keeping a trace of nitrate of silver in combination, must be determined by experience.

When the film is dry, the surface should present a bright and highly-polished appearance. If the collodion has been made from good pyroxyline, any dullness seen by reflected light is always the result of some kind of mismanagement, and is most commonly produced in one of the following ways:—First by adhesion of insoluble salts of silver, from the plates having been placed in hard water, or salt and water, before the nitrate was sufficiently removed by distilled water; secondly, by the film having been too much dried before immersion in the nitrate bath; and thirdly, from the use of over-iodised collodion. In the first case the precipitated matter will appear in smears following the direction in which the plate entered the hard water, or in which the water first flowed over it. In the second case, the deposit will probably be confined to the neighbourhood of the two edges which were upwards when the collodion was poured off, which edges will look blue and transparent. In the third case, the loose iodide will be distributed more uniformily over the plate, without the transparent edges at the upper end. In the first case, if the precipitated matter is of small amount, it may be entirely removed, and the plate made practically as good as if no deposit had been formed on it, by attaching the glass to the holder, and rubbing the surface with a tuft of clean dry cotton wool. This should have a handle formed by binding round a part of the wool with string, the end of which should form a loop, to hang on a nail in the edge of a shelf or other convenient place. If kept for this purpose only it may be used for a great length of time. In the second and third cases, the plate will be improved by removing the loose iodide in the same manner; and in the second case, the picture will be good on that portion of the film which retains its opacity, and is not rendered more transparent by the loss of iodide of silver. In the third case, a good result cannot be expected, especially when the amount of loose iodide is large, and has marked the film by bursting out irregularly.

In all cases it will be well to brush the surface of the excited plate with the cotton wool before placing it in the slide, to remove any particles of dust which may be present. If a new and horny collodion was used pretty hard rubbing will cause no injury, especially when the solution of tannin was somewhat concentrated.

AN AMATEUR'S EXPERIENCE.*

By E. Borda.

For some time past my friend, Mr. Coleman Sellers, so well known to the readers of your present Journal as an experienced and enthusiastic amateur, has been trying to convert me to his wet process, for field work. Though acknowledging the fine results he has obtained, and how much more convenient it is than the other wet process, I have met with such encouraging results ever since last spring with the simple and beautiful tannin process, that my friend "Humidus" has not yet progressed much with the task he has undertaken with me, and I am rather inclined to believe that one of these days "Siccus" may carry the day in this friendly struggle.

But to give "Humidus" his due, and let your readers benefit by what my limited experience in photography may be worth, I wish to give them the result of an experiment I have just made with some gun cotton prepared by Mr. Sellers from bleached cotton, and sensitised according to the formula he gave me, as I think the result indicates two important points:—First, that the gun cotton made from the bleached cotton, and in the manner explained by Mr. Sellers in *Humphrey's Journal* of July 1st, 1861, is a very superior article; second, that photographers desirous of obtaining very quick and even instantaneous collodion are more likely to attain such a result by the proper proportions of pure chemicals and the right kind of gun cotton than by the addition either in the collodion or the developer of special chemical agents not generally employed.

The cotton was bleached and made in—

Nitric acid	10 ounces,
Sulphuric acid.....	12 „
Water	1 ounce,

at the temperature of 160°.

In four ounces of good alcohol I dissolved sixteen grains of bromide of magnesium, which dissolved entirely without the addition of any water; I added forty grains of iodide of ammonium, which dissolved readily; then eighty grains of gun cotton, and four ounces of the ether. The cotton dissolved very quickly and left hardly any cloudy deposit. I substituted bromide of magnesium for the bromide of ammonium in the formula of Mr. Sellers, because I had none on hand of the last bromide.

I tried the collodion eight days after it was made, and am convinced it was then instantaneous. I have no contrivance adapted to my camera for instantaneous photography, but the following result will, I think, convince you that I am justified in stating that the collodion was instantaneous. I enclose a print from a negative taken with it in a fraction of a second, with stereoscopic lenses of short focus, and with a diaphragm one-eighth of an inch. The sharpness for the whole distance sufficiently indicates the use of a very small diaphragm, and the pair of dark bay horses in the background is a sufficient proof that the impression was obtained in a very short time. I uncovered and covered again my lenses pretty nearly as quick as it can be done by hand, and am satisfied in much less than one second, and, as you will observe, the last ridge of mountains (some six miles distant) is rather over-exposed. The negative was developed merely with protosulphate of iron. How long this collodion will remain very sensitive I mean to test from time to time. Although passionately fond of the art I have but little time to practise it, and cannot follow at regular intervals, as I should like to do, its loss of sensitiveness.

I might have been tempted to say something about the tannin process, but I find the results of my experiments to agree so much with the well condensed description of it given by Mr. C. W. Hull, in the card of Messrs. J. Stock and Co., respecting their new dry plate box and holder, that I have but little to add.

I differ with him only in the propriety of using albumen on the edge to hold the collodion, as the object can be as well attained by varnishing the edge over the film after exposure, and before developing, without introducing albumen in the bath, and which is certain to do it no good. To keep a silver bath in good order, and so that it can always be used for any process, is, particularly for an amateur, a great desideratum. I would add that by drying the plates quite quick as soon as they come out of the tannin solution—baking them I may say—I find them to keep better and give me more uniform results than if allowed to dry spontaneously. With great contrasts in a view, in a strong light, such as water, white buildings, light-coloured rocks, dark foliage, &c., more softness is obtained, and the equal development better regulated with a warm solution of gallic acid and silver than with pyrogallic acid.

* From the *American Journal of Photography.*

Exhibition.

SIXTH ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF SCOTLAND.

[SECOND NOTICE.]

In our last we made some observations on the Exhibition as a whole, to which we added a notice of some of the landscapes. We remarked on the great plethora of *carte de visite* portraits, and, *apropos* of these, beg to offer a remark. It is felt and acknowledged that, especially in winter, these are a source of great trouble to the professional photographer, the "fash," of course, coming into operation after the camera operator has done his part. Now, as it is notorious that these pictures are seldom, if ever, used for their legitimate purposes, viz., visiting cards, the suggestion here offered is—would it not be better to take direct positives by two or four at a time? It is not necessary that these should be taken on glass plates, seeing that black enamelled cards answer the purpose as well, if not better, and can be manufactured at a very small cost. By this procedure the public, we doubt not, would be equally well pleased, and, in respect of getting them before leaving the premises, perhaps *better;* but to the photographer himself what a gain would result! In the first place the customer sees the result at once, and not after time and material have been wasted in producing prints on paper, and, as we have said, goes away with the results in his pocket, leaving in the artist's pocket, or in his till, the *quid pro quo.* There is no calling back in a few days; no waiting for sunny weather; no bad debts; no ——in short the advantages consequent on these would be appreciated by the dullest photographer. A collodion positive, if well taken, is a beautiful picture. Of course we cannot include in this category many of those glass positives which adorn or disgrace the stairfoot of some of the so-called artists in Edinburgh; but we feel satisfied that were the Claudets, the Tunnys, the Rodgerses, and the Ross and Thompsons of the art to bestow a tithe of their attention on this hitherto-neglected branch of photographic art a vast improvement would, doubtless, result. "Every dog has his day," says the proverb; and *carte* portraits printed on paper may yet yield to those taken on glass or card direct in the camera.

One is almost amused, when standing before the numerous frames of *cartes* in the Exhibition, to see the infinite variety of posing displayed; and here it is we see the difference of taste among photographers. As a rule the lowest class try to secure intense sharpness, coupled with a perfect display of all those charms lent by the aid of the jeweller and haberdasher, while those of the higher class aim chiefly at pictorial effect, although by no means blind to the effect of the necessary sharpness.

Among these *cartes* we would class those of Robinson (of Leamington) and Rodger (of St. Andrew's) as the best—the frame numbered 174, by Robinson, being the best by that artist.

No. 194—a collection of thirty portraits (by Dallas)—contains many—say fully one-half—pictures which may be termed first-class.

No. 225—twelve portraits (by Musgrave)—are very fine. One of them, however, the portrait of the Rev. Dr. Alexander, calls up ideas associated with the guardian of a Freemasons' lodge: the posing is not graceful, and the sash and gown do not at all improve our intellectual townsman.

Abbot, of Dundee, evidently takes Rodger as his model, and follows very closely on his heels.

Nesbitt contributes a frame of twenty-four portraits, many of which are of great beauty, especially his portraits of children.

A frame of nine portraits by T. Annan, of Glasgow, satisfies us that, quite as much at home as this artist may be among landscapes, he is equally so in portraiture, some of his pictures being gems.

Among the large portraits there is an especial beauty in some of Hering's—for instance, in that of No. 103, the portrait of a lady. The face of the renowned Sam Cowell, as taken by J. G. Macandrew, is a perfect study—the comicality and character of the man being excellently portrayed.

No. 4—*Can you do this, Grandpapa?* by an amateur, who modestly withholds his name—is the most perfect bit of drollery in the room. It represents a little fellow, some four years old, in his "birthday suit," apparently making a meal off his great toe, looking at the spectator, with an aspect of irresistible humour, as with toe in mouth he asks the question—*Can you do this, Grandpapa?* In No. 6 (by the same artist), *Art on Photography*, about which so much has been written of late, is here personified in the person of the aforesaid juvenile, still *minus* his clothes, seated on a camera nearly his own size, with pallet, brush, and mahl stick in his hands, and a dilapidated Venus in the distance. Of equal merit are two portraits in the same frame.*

When speaking of *cartes* we omitted specifying those of Moffat, which are quite equal to his large portraits, to one of which (459), a portrait of George Harvey, R.S.A., we would call especial attention.

Claudet exhibits a number of portraits which well sustain his reputation. We may particularise two as of special excellence (Nos. 331 and 313): it would be difficult to say which of these pictures is best, although, from the intrinsic difficulty of photographing it, the former may be most meritorious.

A. M'Glashan, assisted by the artistic skill of D. O. Hill, R.S.A., exhibits fourteen pictures, all of which are characterised by an amount of breadth and largeness of treatment seldom seen. In particular, we would call attention to his portraits of the Lord Advocate, Dr. John Brown, and D. O. Hill and his wife. Were a comparison to be instituted between the works of Claudet and M'Glashan, we would say that the former might be compared to the highly-finished pre-Raffaelite pictures, and the latter to the masterly and rather sketchy treatment of some of our best portrait painters, for they have much of the same breadth and simplicity of character. M'Glashan's pictures indeed possess merit of the very highest order.

Passing over many other excellent pictures we would direct attention to some of the groups, a class of picture, perhaps, more difficult to take well than any other. We would unhesitatingly say that the best group in the room is No. 128, by J. G. Tunny. It is what appears to be a family group of twelve individuals, in which Mr. Tunny has indeed made the most of his subject, as the grouping and general arrangement are very good, and every head seems to have been specially focussed.

From the papers on art which have appeared in The British Journal of Photography, by W. H. Davies, we were induced to take a more than passing look at his pictures, and find some among them which are very excellent. We may specify No. 447—a portrait of a gentleman—as being very much above the average: although it has by no means received justice in the printing, the arrangement and general effect must be acknowledged to be admirable.

It displayed very questionable judgment on the part of the hanging committee when they placed in such close proximity Nos. Nos. 533 and 534—the first by Orange, and the second by Claudet. The former, *The Earl of Morton*, would have simply been passed over but for this unfortunate arrangement, by which he is made to act as a foil to the other little gem by Claudet. Were we inclined to criticise Mr. Orange's picture of his lordship, we might say that it is a mere compilation of hard angularities; the most truthful portions of it being the stand of the head-rest and the legs of the chair.

No. 599, by A. Mitchell Innes, is a portrait deserving of great praise for its general arrangement. It is a gentleman represented seated on a rock, with a huge gnarled stump at his side, and a rocky landscape behind and around him.

It is matter of regret that, judging from the scanty attendance of visitors, the Edinburgh public generally do not seem to be aware of this collection of pictures in their midst. We fear the managing committee are not sufficiently aware of the value of "printer's ink." We have looked in vain for one of their advertisements in the most extensively circulated daily paper in Edinburgh. It is however, we believe, advertised in some of the others; but, from whatever cause, the public do not seem to appreciate this Exhibition.

AUR. CHL.

Bishop of Brechin.—Mr. Valentine, of High Street, Dundee, has recently published a whole-plate-sized photographic portrait of the Bishop of Brechin, the proceeds of which are to be handed over in aid of a charitable fund.

American Photographic Exchange Club.—Our friends "over the water" have been following our lead. An Exchange Club has been organised in New York, and is alleged to have been in successful operation for three or four months. It includes nearly all the leading amateurs in that city, and strong hopes of its permanency are entertained. With this pleasant bit of intelligence anent our peaceful art comes the welcome reassurance of peace being secured—at least for the present—between the two great branches of the Anglo-Saxon family. May it never be disturbed!

* We have strong reasons for believing these to be Rejlander's productions.—Ed.

Scraps and Fragments.

ROMAN PHOTOGRAPHS FOR THE GREAT EXHIBITION OF 1862.—The *Athenæum*, in its art gossip from Rome, says that Mr. Macpherson and Signor Cuccioni are busy with their cameras; and that we shall have, with the old photographic favourites, views of many sites scarcely, if at all, known to the English tourist. Mr. Macpherson is said to have made a great addition to his portfolio.

PHOTHOGRAPHIC PERIODICAL LITERATURE.—We are glad to welcome the appearance of a new member of the foreign representatives of Photography in *Le Bulletin de la Photographie Belge*, which, though small in size at present, will no doubt in due time reach more extensive proportions. The first number made its *debut* on the first day of the present year, and is to be followed by others semi-monthly.

REAL ENTHUSIASM.—A correspondent, who "particularly objects to appear in print," recently wrote to us in reference to one of his views as follows:—

"To obtain the former I pretty nearly risked a broken neck, the best position for the camera being very difficult of access; moreover, fear is an unknown feeling to a photographer in search of a good view point. Often have I crawled round ledges of rock, with a yawning gulph under me, grasping stout roots with the one hand, carrying my camera, &c., with the other, and having left my boots on *terra firma* behind me, till I should come back—if ever."

This shows so hearty a relish for our art that we cannot forbear putting this "bit" of his note "in print."

A HINT FOR M. DU CHAILLU.—Amongst the novelties in the *soi-disant* card-portraits, we notice one recently introduced by the London Stereoscopic Company of the celebrated gorilla that is expected by Mr. Layard, M.P. (according to the development theory of the author of *Vestiges of Creation*), to lecture upon Mr. Spurgeon, upon the principle that "one good turn deserves another." Scene: the lecture-room of the Royal Society, in A.D. 5862—a lecture-table, on which are a caraffe and glass, *en règle*—and a bust of Mr. Spurgeon. Behind the table stands a learned gorilla, in an attitude expressive of energy, with hand on the bust, addressing a numerous and select audience of other gorillas. The object is an embodiment of the joke of the "Member for Nineveh," as *Mr. Punch* designates him. The photograph is evidently taken from a drawing of the subject.

We cull the following from the *Athenæum*:—

"The London Stereoscopic Company have issued, among their later enterprises, a series of instantaneous views of Paris—of buildings, boulevards, street-views, and the like—taken, we infer, by French artists. They are extremely sharp, vivid, brilliant, full of life and motion—the very image of the actual places and events transferred and fixed for ever. We have recently been looking over a good many French and Italian photographs, and we must warn our English friends that in the coming contests at South Kensington they must look for stern trials of strength. The French artists have the advantage over us in marine and street subjects—the Roman and Venetian artists in landscape and structure. Our figure photography is, perhaps, superior to the French or the Italian."

The Paris views to which allusion is above made are the same as we described in a previous number, and we have since learned that they are *not* the production of a French artist, but of one of our own countrymen bearing the very British name of English. This fact will take a trifle off the score of our continental friends and add it to our own.

AMERICAN JOURNAL OF PHOTOGRAPHY.—When recently noticing the omission to which allusion was made in a paragraph in a previous number, and which has been atoned by the parties indicated, we pointed out that the same offence had also been committed by our brother editor of the *American Journal of Photography;* but we find the contrast that, instead of an explanation, he still persists in the practice. In his number for the 15th of November we find one of our own papers, occupying six of his pages, without acknowledgment. Surely our friend cannot suppose that he has any *right* to make use of what appears in our columns. The offence is the more glaring because in the same number of his Journal three other papers are extracted from the pages of our contemporaries, but *with* proper acknowledgment of the source whence derived. In order that we may not be misunderstood we add that our name as the author of the paper is given, and the fact that it was read at a meeting of the Bradford Photographic Society is also mentioned; but, as it was published exclusively in this Journal, it could have been derived from no other source. It may appear very flattering to us that our contemporaries think we can afford to have ou pages rifled in this unceremonious manner; but it is uncourteous in the highest degree, and we are determined to point out the offence whenever we notice its occurrence.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

TONE: ITS IMPORTANCE IN RELATIONSHIP WITH THE ARTISTIC EXPRESSION OF LIGHT, AIR, AND SPACE.

"I would wish you to forget who it is that speaks to you; I only direct you to higher models and better advisers. We can teach you here but very little. * * We have endeavoured to lead you to the admiration of nothing but what is truly admirable. If you choose inferior patterns, or if you make your own *former* works your patterns for your *latter*, it is your own fault."—*Sir J. Reynolds.*

"Much will the mirror teach, or evening gray,
When o'er some ample space her twilight ray
Obscurely gleams: hence art shall best perceive
On distant parts what fainter hues to give."—*Fresnoy.*

MY DEAR FELLOW-STUDENT,

Before re-commencing our studies, permit me to correct an error into which I inadvertently fell by describing H. Howard, R.A., as President, instead of Secretary, to the Royal Academy.

Let me now resume from the point at which, in my last, we broke off. We were then considering the apparent impossibility of representing nature's vast scale of tones with the insignificant range supplied by even the most extended resources of pictorial art. You will remember that we have, once before, incidentally touched upon this subject, and that I concluded my last epistle by pointing out how gloriously certain great painters surmounted these seemingly insurmountable difficulties in forcibly and eloquently expressing the real effects of light, space, and air.

Mere relief is quite as much a question of tone as of contrast; and although by relief we to a certain extent secure the effect of space, it is space *without air* if it lack tone. Relief is, of course, a very precious quality, and contrast, as we have already seen, under the head of "Subordination," is also of no small value; but tone is their crowning charm after all.

If we expend all we possess on one plane of, say, middle distance, as many do, by getting both white and black, and all their intermediate tones within its single boundaries, every other plane must, of course, be sacrificed; nothing can be more remote—nothing can advance nearer: middle distance, extreme distance, and foreground are all apparently removed an equal distance from the eye, and the landscape is more like a map than a picture. If, again, we more judiciously expend our means and give to three or four planes what belongs of right to the more minute divisions of aërial space, we certainly get distance, and secure the effect of air to some extent, but we entirely miss tone.* The scenes in a theatre may get an effect almost as near the truth by the mere placing of one set scene a few feet before or behind another. But where are all the intermediate stages of distance? Where is that harmonious blending of parts—that insensible union of the extreme foreground with the extreme distance which constitutes what we understand in the term "Tone?" Remember how countless these various planes of distance are in nature: branch is relieved from branch and bush from bush; even leaf stands apart from leaf in the nearest mass of foliage. How numerous, then, must be the stages by which we reach the far horizon, and how vain must be any attempt to give anything like the harmonious tone of nature by adopting only some three, four, or five distinctly-marked steps from foreground to the extreme distance.

To secure the full extent of our scale of tones, then, we must seek the utmost purity in the whites and blacks of our pictures; or, in other words, we must take care that in their more prominent plane certain small points of our negatives are to be as intense, and certain others as transparent, as possible—from opaqueness to perfect transparency, or pure glass, being the two extremes of our scale. In Ruskin's *Elements of Drawing* he tells his pupil:—"There is no better test of your colour *tones* being good than your having made the white in your picture precious and your black conspicuous." One of the finest photographic illustrations of the value of tone was shown me some months since by Mr. V. Blanchard in one of his negatives of a sunset view on the Thames. This was composed almost entirely of the darker tones, and some small touches of white, gleaming upon the edges of a picturesque cloud veiling the sinking monarch of the day, was the only bit of pure white in the picture: a minute touch or two of extreme dark

* "The word 'tone' is liable to be confounded with what is commonly called 'aërial perspective.' But aërial perspective is the expression of space by any means whatever—sharpness of edge, vividness of colour, &c., assisted by greater pitch of shadow—and requires only that objects should be detached from each other by degrees of intensity in proportion to their distance, without requiring that the difference between the farthest and nearest should be in positive quantity the same that nature has put."—*Ruskin.*

were supplied, if I remember rightly, by a boat or two; and although the scale of tones intermediate between these two extremes was so very limited, the prints from this (I believe recently-published) picture was full of harmonious gradations, and glowing, rich, and luminous, but not glaringly brilliant, air. If Mr. Blanchard produces many such, Wilson's laurels are much endangered. With reference to the scale of tones to be chosen, whether it embrace the two extremes and all their intermediate gradations, or whether it be chosen from the more or less luminous portions, its tones should be proportioned to the space you may have to represent, the sentiment you wish to express, the character of the light, &c.; but there must be no flat, ungraduated masses—no jerky transitions from one plane of distance to another—no large proportions of black or white—in short, no want of tone.

Tone is as nearly allied to harmony as we have already seen it is to aërial perspective; it must not, therefore, be thought mere repetition if I now urge another consideration, which, like the preceeding one, was also touched upon in a previous letter, although but slightly.

Quoting from Ruskin, I said at our last meeting in these pages, that "the whole picture should be felt to be in one climate, under one light, and in one kind of atmosphere;" and referring again to the same eminent authority, by way of illustrating this, in speaking of an occasional want of tone in the pictures of Cuyp, and instancing a large picture in the famous Dulwich Gallery, he says:—"The *lying* cow in the same picture, which is in most visible and painful contrast with the one standing beside it, the flank of the standing one being bathed in breathing sunshine, and the reposing one laid in with as dead, opaque, and lifeless brown, as ever came raw from a novice's pallete." And speaking of another work by the same master, he points out how "while the figures on the right are walking in the most precious light, and those just beyond them in the distance leave a furlong or two of pure visible sunbeams between us and them, the cows in the centre are entirely deprived, poor things, of both light and air, and have nothing but brown paint to depend upon." These are instances of the want of tone, as regards light and shade, and serve to show the evil effect of such discrepancies; and are not peculiar to colour, but may be found in engravings and drawings in monochrome as well as in photographs. Turner was always, especially in his later works, more studious of tone in its relation to light and shade than to colour, as we find in the engravings which have been executed after his works, which lose none of their beauty of tone when translated into printer's ink. His drawings executed in sepia are also full of tone, as we may see in the photographs of the *Liber Studiorum*.

Artists frequently adopt a plan which might be applied with advantage to a print from a negative deficient in tone, by covering the more prominent high lights of their drawing with albumen, applied with a small hair pencil, which, being removed after the application of weak tobacco water to stain the whole surface, leaves the parts thus protected white and untinged. No brilliancy or force would be lost in adopting this method, because, although all the inferior lights were thus subordinated, every other part would be proportionately darkened, and the gain would be necessarily great. This would generally secure a nearer approach to black in the deeper touches, and always make your white prominent "by general depth of middle tint, by absolutely refusing to allow any white to exist except where you need it, and by keeping the white itself subdued by grey, except at a few points of chief lustre."*

> "Rare things alone are dear in custom's eye:
> They lose their value as they multiply."

Tone must not, however, be considered without reference to the various qualities of different surfaces in the shadows they receive and the light they emit, as may be seen in the following quotation from Ruskin, who has written so much more about tone, and so much better—to my thinking at least—that I shall now conclude with one other quotation from his *Modern Painters*:—

"It is the constant habit of Nature to use both her highest lights and her deepest shadows in exceedingly small quantity—always in points, never in masses. She will give a large mass of tender light in sky or water, impressive by its quantity, and a large mass of tender shadow relieved against it, in foliage, or hill, or building; but the light is always subdued if it be extensive—the shadow always feeble if it be broad. She will then fill up all the rest of her picture with middle tints and pale greys of some sort or another, and on this quiet and harmonious whole she will touch her high lights in spots. The foam of an isolated wave—the sail of a solitary vessel—the flash of the sun from a wet roof—the gleam of a single whitewashed cottage—or some such sources of local brilliancy she will use so vividly as to throw everything else into definite shade by comparison. And then, taking up the gloom, she will use the black hollows of some overhanging bank, or the black dress of some shaded figure, or the depth of some sunless chink of wall or window, so sharply as to throw everything else into definite light by comparision, thus reducing the whole mass of her picture to a delicate middle tint."

Seeing that so much tone exists in the pictures of nature, we, then, have so to reproduce it in our photographs* that it is not lost by over-exposure, over-developement, over-intensity, or overlooking the importance of such studies as now engage the attention of yourself and your fellow-student,

ALFRED H. WALL.

* *Elements of Drawing.*

Entremets.

IN SEARCH OF AN OPERATOR.

(*Continued.*)

My previous experience induced me to anticipate that this search of mine would not be a brief one. I knew well enough that operators were sadly too numerous, and therefore that applicants would not be at all wanting; but I was certainly not prepared for the crowd that besieged my studio on the day my advertisement made its appearance in two of our daily and one of our photographic journals. Some came in person, some sent friends, and many wrote; but it was not until my want had again been made known in print three several times that I secured the right man in my left vacant place. But this, I believe, is the common experience of all who employ photographers. My search went very far—with me at any rate—to prove that while the number of those who have taken to the art for a calling or profession is legion, that of those who command a tolerable share of success in its practice is few; that while the former find small pay and an equally small demand for their services, the latter are so seldom disengaged that he who would catch them must either bait his trap exceedingly well, or keep "the crystal windows of his soul" in an exceedingly wide-a-wake condition.

I take my search, then, as beginning with that morning on which the eager public rushed frantically to the newspaper offices to purchase my advertisement. (I remember copies of the papers were in great demand, but forgot exactly why.) I moreover remember distinctly that the first sound which fell from my lips that morning—I do not count snoring, which is more intimately connected with the nose—was, "Fog again!"—an exclamation which, I will venture to assert, was the first heard from the lips of more photographers than myself on that occasion.

When I reached my studio there lay a little bundle of unopened letters. I will give you the contents of two as samples of their quality. (No. 1)—

> To Mr RAS. Esqr.
>
> sur, has i see A advurtusmint wanting A hoprator in the times i size the Hoppertonety of Saying has i is in wants of A city wation i can have A good carecter from my last place And is wel up in the poseteve and negerteve and can print yours respectervelly
>
> GORGE H——
>
> Selery one pund a weak

I preserved the letter of a gentleman who could print "yours respectervelly" as representative of no less than five similar epistles; but the following stands *solus* and represents itself alone:—

> If R. A. S. can offer *a first-class salary*, and ensure L. G. *the treatment due to a gentleman*, he may obtain the services of L. G., who may safely assert that he is one of *the most talented operators in the world*. L. G. will forward *specimens* if the reply of R. A. S. contains full and *satisfactory* particulars as to *salary*, nature of required *services*, &c.

I forwarded the necessary particulars, but suppose L. G. did not find them satisfactory, as I heard nothing further from "one of the most talented operators." The other letters contained nothing uncommon; and putting aside the more promising for further notice, I went about the business of the day, with which, however, the fog interfered so completely that when the first applicant for my vacant situation was announced I quite hailed his coming as a very agreeable interruption to my dreary state of nothing-to-be-done.

* Tone is far more easily secured by the photographer than by the painter.

He came in the form of a very shabby, dirty, deeply-melancholy, skeleton-like man. If ever the word *crushed* was written for the reading, it was so in the aspect of that poor, thin, ill-clad, miserable fellow. In his expression—in his neglected person—in his ill-fitting, worn-out, carelessly-patched garments—in the reckless tie of his dingy ragged neckerchief—in the low monotonous tones of his mournful voice—in his movements, like those of one tediously and wearily toiling under a heavy load—in the listless way with which he applied for a situation he evidently never dreamt of obtaining—in these, and in all the minutest details of his appearance, you read, as plainly as you may do here, that one terrible word—*crushed!*

He briefly stated that he had called in consequence of my advertisement, of which he had that morning been informed, stating that, although he had been out of practice for a long time now, he used once to be employed daily in photography; that he would come to me for the very lowest salary if I would only give him a trial; that he did not mind what he did; and that he could refer me to many gentlemen of standing and respectability in the profession as to his honesty, sobriety, and general character. But although he urged all this, he did so with that expressionless and mechanical way with which I have heard not a few folk, in not a few places, repeat over and over again words which constant repetition had deprived of all real meaning and vitality. I questioned him to learn how far his knowledge of the art and science extended. Alas! the poor fellow did not know that more than one developer was ever used, nor what that one ever contained: he "always used to *buy it ready mixed* for use at Mr. ——'s, in the town of ——," who, however, would, he was sure, speak as to the quality of the pictures he then used to produce, which, moreover, "always gave satisfaction." This fact, coupled with the conviction that the man had not a vestige of living energy left in him, and could never be awakened to an active interest in any mortal thing, brought our interview to a speedy close.

Through one of the gentlemen he named, however, I afterwards learnt his sad history, and found in it more than sufficient to account for the poor fellow's melancholy condition. He *was* literally crushed by such a strange combination of evil circumstances and misfortunes as happily fall to the lot of few, even amongst the least favoured of baby Fortune's human toys.

The next applicant was of a different class;—but I must reserve his description for our next.

R. A. SEYMOUR.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of this Society was held on Tuesday evening, the 7th instant, at King's College. The Lord Chief Baron, Sir Frederick Pollock, occupied the chair.

The President addressed the meeting to the following effect:—Gentlemen, we meet here in accordance with the rules of the Society on the first Tuesday in the month of January. The last meeting was on the first Tuesday in the month of December; and I need not remind you that there has occurred since that time the greatest calamity almost that ever befel this or any country at any time. It is proposed this evening that we should proceed with no other business than that which is essential, in reading the minutes of the last meeting, and going through the form of business which cannot be dispensed with. I shall have the honour of proposing to you this evening the adoption of an address of condolence and sympathy to Her Majesty. We are not a chartered body: we are the Photographic Society, consisting of the members of the Society, who themselves appoint the Council to conduct their affairs and a President to preside over the meetings. It appeared to the Council, in view of these facts—and I entirely concur in the suggestion—that it would be better if the address were presented, not merely from the Council, but from the whole body of the Society—the sentiments which belong to the occasion being those which are universal, and which belong to every individual; for it was not the Council—it was the Society—which the Queen and the late Prince Consort, our Patron, benefitted, and every member is interested in expressing sincere sympathy with the bitter and hopeless bereavement of Her Majesty, and the deep loss which the country has sustained in being deprived of the best services of the Prince Consort. Gentlemen, I propose that this evening we shall do nothing that can be dispensed with, and devote the evening entirely to composing an address of condolence and sympathy to Her Majesty. When the formal business has been gone through, I shall read an address, which has been approved by the Council, and it will be for you to say whether you will adopt and sanction it, and, by an unanimous vote, entitle me to put my name to it, as representing the entire body of the Society.

The Secretary read the minutes of the last meeting, which were duly confirmed.

The President then said:—Gentlemen, I have now to call your attention to an address of condolence to Her Majesty, which has been approved by the Council. It is submitted for your approval and adoption; and I need not say that if any one be desirous of suggesting any modification calculated more fully to express the feelings of the entire Society, that suggestion will be readily followed out. The aim has been to make it, as far as possible, expressive of the peculiar connexion of the Photographic Society with the condescension of Her Majesty and the kind patronage of the Prince Consort. I will now read the address:—

To the Queen's Most Excellent Majesty.

We, your Majesty's dutiful and devoted servants, the President, Council, and Members of the Photographic Society, urged by feelings of the deepest gratitude to your Majesty, and the late Prince Consort, our Patron, humbly venture to address your Majesty to express how deeply, in common with all your Majesty's subjects, we deplore the unexampled calamity which has befallen your Majesty and the entire nation. We, especially, who have been guided by the practical judgment of His Royal Highness—who have been assisted by his liberality, aided by his advice, stimulated by his example, and cheered and encouraged by his presence and by his praise, deeply lament the irreparable loss all society has sustained; and we humbly offer our sincere share of the sorrows of the whole nation, and we pray that it may please the Almighty to pour into your Majesty's heart the only real consolation so great a bereavement admits of, and that gradually your Majesty may derive satisfaction from the happiness of your family, the prosperity and honour of the countries you govern, and the universal esteem and devotion of the subjects who have the benefit of your Majesty's rule.

The President then put the address to the meeting, by which it was adopted unanimously.

The meeting was then adjourned to Tuesday, the 4th February.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of this Society was held in St. Peter's School Rooms, Walworth, on Thursday evening, the 9th instant,—Thomas S. Davis, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The Secretary announced that the Committee had selected as one of the presentation photographs of this session Robinson's *Early Spring*. He had no doubt that this selection would be cordially approved of by the members generally. He would take the opportunity, while addressing the meeting, of expressing his regret that any remarks which he had made at the last meeting in reference to the Committee appointed to superintend the photographic section in the great Exhibition of 1862 should have been taken up so warmly by some of the members then present. He thought himself also unfairly treated by the partial report which had been made in one of the Journals: he considered that where a full report was not given all notice should have been omitted, or if a selection were made it should be such as would give a correct notion of the general spirit of the observations made.

The Chairman said that the President had sent a note apologising for his non-attendance. He then asked Mr. Simpson to read Mr. Fry's paper *On Toning Positive Prints**—a task he (Mr. Simpson) had kindly undertaken on account of Mr. Fry's unavoidable absence.

At the conclusion of the paper Mr. Simpson and Mr. Wall stated that they had opportunities of inspecting some proofs obtained by Mr. Fry's method, and could corroborate that gentleman's statements as to the satisfactory nature of the results obtainable thereby.

Mr. Simpson, in reply to a question from the Chairman, stated that Mr. Fry had not advanced any theoretical opinion as to the cause of his success. He (Mr. Fry) had used phosphate of soda in a similar manner, with equally satisfactory results.

The Chairman suggested that the conversion of the remaining free nitrate into acetate of silver by immersion in the acetate of soda might, perhaps, be one cause, as he assumed that the acetate of silver was more soluble in hyposulphite of soda than the chloride of that base. He (the Chairman) had found it disadvantageous to soak the prints in an alkaline chloride previous to toning. He had observed defects also arise from the paper being unequally absorbent.

Mr. Simpson thought it was much to be deplored that the complaint called "mealiness" was coincident with the benefits which it was hoped would have been derived from the adoption of the alkaline method of toning.

Mr. Henderson, though not a member of the Society, said he would, with the permission of the Chairman, detail some experiments he had made in connexion with this subject:—

1. The print was subjected to frequent changes of *boiling* water during ten minutes: it was then immersed in a bath of acetate of soda two drachms, water ten ounces. It took sixty minutes to tone, and was "mealy."

* The Publisher received from the reporter for this Journal an intimation of a promise having been made to him that the manuscript of Mr. Fry's paper should be forwarded to the Editor in time to be included in the present number; up to the time of going to press the paper had not been received by the Publisher.

2. A print of the same character, from the same negative, was washed fifteen minutes with *cold* water; toned as before, but took only thirty minutes. It was less "mealy" than the first one.

3. A similar print was washed ten minutes. It took twenty minutes to tone, and the result was much better.

4. A similar print washed five minutes—toned ten minutes—was very good when finished.

5. A similar print not washed at all took only six minutes to tone, and yielded a better result than any.

He (Mr. Henderson) had observed that when his toning bath became inactive, its activity was restorable by the addition of acetate of soda.

Mr. Price said he would be glad to know the proportion which should be observed between the acetate of soda and chloride of gold.

Mr. Hannaford thought it unimportant so the acetate of soda were in decided excess: he had used as much as 160 grains to the ounce.

Mr. Henderson, in reply to a question from the Chairman as to whether he had observed the effect the proportion of acetate of soda had on the mealiness complained of, said he had tried other acetates, among them acetate of ammonia, but he inclined to the opinion that acetate of soda was the most efficient preventative.

Mr. Hannaford remarked that there were two kinds of mealiness, one of which he rather liked as giving an effect very suitable for some subjects. He had observed that when he had washed a print in water, and simply immersed it in the acetate of soda bath before toning, there had been no mealiness, though he had not washed with chloride of sodium first: further, that if a print were slightly washed and immersed in chloride of sodium it would be more mealy than if well washed and treated in the same way. He thought it would be found that in all cases where the washing in water was imperfect, mealiness would occur, but where the washing was thorough, and a new toning bath employed, this untoward result would not take place. In some instances he had found fixing in *hot* hyposulphite entirely prevented mealiness. He might mention also another circumstance which he had sometimes observed in washing large prints, and that was that the water was repelled from some portions as though the print was greasy. In those cases he had found it advantageous to add a little ox-gall to the preliminary washing water, which had the effect of causing the water to flow evenly over the whole surface.

The Chairman had observed that, when the free nitrate in the paper was converted into chloride, the pictures toned unequally.

Mr. Simpson thought these inequalities arose from the unequal absorption of the albumen by the paper.

Mr. Hart had great success in toning so long as he continued to use distilled water freely in his preliminary washings; when, however, through necessity he resorted to hard water containing lime and other salts, his results were utter failures.

The Chairman concurred with Mr. Hart in advocating the use of distilled water.

Mr. Simpson doubted not that water containing carbonates and chlorides largely contributed to the production of mealiness; still it should be remembered that this phenomenon occurred on prints treated in every respect the same as those upon which it did not occur—even on parts of the same sheet of paper. He did not think, therefore, that it was *solely* attributable to the water. He would direct attention to the fact that mealiness was not found to arise with plain paper, but always on albumenised paper. There was another circumstance which had not been named: he had observed that a weak negative increased the tendency to mealiness, but where the action of light was most complete there was the least mealiness.

Mr. Martin thought that the cause of mealiness might be found in the more or less perfect *reduction* of the silver and gold to the metallic state by the acetate or phosphate of soda employed. These salts, it was known, acted as weak *reducing* agents on the salts of the nobler metals; and the remarks which had been made that evening tended to prove that where the *reducing* salts were in marked excess mealiness did not occur. His view of the matter was singularly coroborated by Mr. Simpson's last remark as to the absence of mealiness when the *reducing* action of light was most complete.

Mr. Leake said he had one day produced an unusually bad batch of prints through the eagerness of his assistant to get the toning done, he (the assistant) having added a large quantity of chloride of sodium to the preliminary washing water. The prints were so mealy as to necessitate their complete rejection. He had found that when he omitted the immersion in an acetate of soda bath, previous to toning, the prints were always mealy.

Mr. Hannaford had found it advisable in the preparation of the toning-bath to add to the chloride of gold sufficient chloride of sodium to form a doubles alt, and then sufficient carbonate of soda to make it alkaline: he preferred also to keep his toning-bath in a concentrated form.

M. Henderson, in sensitising his paper, had found it possible to use a solution of nitrate of silver containing as little as thirty grains, and even twenty grains, to the ounce, merely taking care to float a longer or shorter time according to the strength.

After a vote of thanks to Mr. Fry and to Mr. Henderson—the originator of this method of toning—the meeting was resolved into a special one to resume the adjourned discussion relative to the new place of meeting.

The Chairman called on Mr. Martin to communicate the information he had obtained on the subject since the previous meeting, and, after a short discussion, a motion proposed by Mr. Simpson, and seconded by Mr. Hannaford, was unanimously carried, to the effect that the next meeting of the South London Photographic Society should take place at Sussex Hall, Leadenhall-street, on Thursday, the 13th February.

The following gentlemen, being duly proposed and seconded, were elected members of the Society:—Mr. Vernon Heath, Mr. Henderson, Mr. Frederick W. Hart, Mr. Farringdon Lane, and Mr. Alfred Harman.

The meeting was then adjourned.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

A General meeting of the members of this Society was held on Friday, the 17th ult.,—the President, Dr. Anthony, in the chair.

The usual business having been transacted, and Mr. F. Whitlock having been nominated an ordinary member of the Society, Dr. Anthony read the following paper:—

On the Constitution of Photographic Societies.

While thanking you for the honour you have done me in electing me as President of this Society, permit me to make some observations with reference to the formation and constitution of photographic societies in general. I believe that considerable confusion exists in the minds of many as to the scope and action of societies such as this; and that it has the effect of preventing many amateurs from joining in the formation and working of photographic societies in their respective districts. Therefore, I think the time will not be wasted in pointing out—first, why the aggregation of individuals practising photography into a society is more capable of benefitting the art (especially in an educational point of view) than the isolated efforts of the same individuals; and next, what are the objects which a society should propose to itself in order to be both permanent and useful.

The photographic society of a district would naturally consist of professionals and amateurs—the former having a large amount of experience, and the latter (it is presumed) an equal stock of zeal—each having more or less means at his disposal, and each a greater or less amount of scientific knowledge. Supposing both to have a fair knowledge of the art in question, it is manifest that the professional and the amateur could respectively communicate knowledge and be of mutual service. The professional, who has but little time at his disposal for experiment, could, from daily practice of an adopted routine, and an observation of the constant recurrence of certain phenomena, explain away the majority of the difficulties which beset and perplex the photographic amateur, especially at the commencement of his career; while, on the other hand, the advanced amateur has ample opportunities of reciprocating the kindness, inasmuch as the talent and industry brought to bear by amateurs upon photography within the last ten years have greatly advanced the art: and, as it is not unfair to suppose that the gains of professional photographers are augmented in proportion to the perfection of their works, it follows that any means which should facilitate the interchange of ideas between professional and amateur photographers would be a boon to both classes, and tend greatly to the improvement of the art in general.

No one, I believe, would pretend for a moment that the photographic art has reached its highest point of perfection; and as discoveries, or *quasi* discoveries, are made daily, it becomes a matter of the utmost importance that the statements made should be verified or disproved. As this involves experiment, the verification is generally undertaken by the amateur, and has for the most part been hitherto done in so desultory a manner as to suggest the advantages which would be gained if so-called facts and discoveries were regularly investigated, from time to time, by a committee of a photographic society. Such a mode of proceeding would have this double advantage; it would enable the results of experiments to be clearly placed on record, and to go forth to the world with considerably more weight than as the mere *ipse dixit* of any individual.

This naturally leads to the consideration that, supposing discoveries to be made by members of a photographic society and duly verified, these discoveries would not only receive more attention from the photographic world when endorsed by the society, but would be so unmistakably placed on record as to obviate the possibility of any of those impudent attempts at pirating the honour of a scientific discovery which, I am sorry to say, have been but too frequent of late.

But another reason why a well-constituted photographic society has the power of advancing the art is in the fact that a degree of emulation is induced in its members, which emulation, if carried on in a fair spirit, tends most powerfully to the educational advancement of every individual member of the society, and so gets rid of a great deal of that apathy and carelessness of manipulation which are always found to obtain where amateur photographers are not in the habit of interchanging ideas, but go blundering on, more than half inclined to lay the blame of each spot, stain, or failure on some adverse demon.

I presume it to be perfectly evident that, supposing the necessity for a protest should arise, the protest of a society would have the greatest weight of which any protest or remonstrance would be susceptible; in act, efficient protests could hardly be made by individuals, as their efforts would more resemble the uncombined attempts of a mob, than the concentrated power of an organised and disciplined body.

It seems to me, then, from whatever point of view it is looked at, that

the formation of societies in different districts, by individuals who have certain tastes in common for the prosecution of an art, must invariably possess advantages which could not be enjoyed by the individual practising the art entirely by the light of his own resources. The maxim that "union is strength" will be found to hold as true in photography as in the "bundle of faggots" of the fable.

Trusting that you will agree with me as to the desirability of photographic societies on the grounds I have set forth, let us next see in what way a society could best be constituted so as to work out thoroughly the purposes for which it is intended, and endeavour to apply the principle (so far as our funds will allow) to the working of our own Society. Premising, then, the advancement of the photographic art to be the main consideration, I believe the following to be *desiderata* quite within the scope of a society which is really in earnest, and which *desiderata* are, to a great extent, unattainable by the mere individual.

A glass room, and small laboratory attached, either the property of the society, or accessible for its purposes, in which experiments might from time to time be made on questions which it might be important for the society to verify, and in which rooms, also, lectures might be given and practical instruction in photography afforded. In connexion with these rooms it would be desirable that there should be a small collection of the best works on chemistry and optics—many of which works, I have no doubt, would be presented (at all events I may state my individual willingness to contribute); but, in addition to these, it is most important that the English, French, and German photographic periodicals should be taken in, and, like the works I have named, made available for reference. It would be absurd to imagine that we in England have a monopoly of discovery in all that is valuable in photography, and yet I am afraid that we unconsciously hug ourselves with some such idea. I believe that our photographic *amour propre* will receive a slight shock from the forthcoming International Exhibition; but it will do us good, stimulate us to further exertion, and I hope show us the necessity (if any further indication be needed) of being well acquainted with the contemporary discoveries of our photographic brethren throughout Europe. If these foreign journals should be "sealed books" to some members, I doubt not that others would undertake to give the Society, from time to time, abstracts of the information contained in these journals, as well as in special works on photography published in France or elsewhere—the expense of such works to a society being very inconsiderable, while I believe that their utility would be very great.

There is no doubt that a certain knowledge of optics is *desirable* to the photographer, while a knowledge of chemistry is *all but indispensable*. The ordinary photographer may go on taking pictures of a certain kind, but if he know nothing of the "why and wherefore" of the curious phenomena continually manifesting themselves, he is precisely in relation to the educated photographer what the organ-grinder is to the musician.

Therefore, *it behoves a society to give its members all possible facilities for acquiring chemical knowledge;* and I do not think I need enlarge on the advantages which would accrue from the delivery of lectures on the chemistry of photography, to which lectures the public might be admitted on certain conditions, and of which I have reason to think it would be ready to avail itself—the public mind in general being in a state of Cimmerian darkness as to the phenomena of photography, beyond that it is a something done by light, by aid of a machine, the dark closet being universally considered as a most mysterious and unaccountable place.

So, while general ideas were being disseminated, as to the principles of the art, and a knowledge was gradually being acquired of the powers and capabilities of the working tools, it would be as well to consider if it did not come within the province of a society to facilitate also the giving instruction in the practical department of the art to those amateurs who might be desirous of availing themselves of it; and I do not doubt that very many persons would be very glad thus to avail themselves of so easy a mode of mastering the photographic alphabet.

Photography claims to be a fine art; and I believe it to be one, though as yet in its infancy. No one who has watched, as I have, its progress from the early days of daguerreotype, can fail to be impressed with the wondrous change which has taken place in the character of the works produced. Let any one look at the chronological gallery of early Italian art at Florence, and he will find that it took a century to effect as much change in the first rude, wooden efforts of the painters as photography has accomplished in one-tenth of the time. I believe in the future eminence of photographic art; but art has its laws, and there is no reason why we should not (as these laws have been made objects of special study) avail ourselves of the knowledge which we may be sure all good painters are careful to apply, for the world is getting very intolerant of sprawling groups, and stolid portraits, and landscapes taken from the very worst point of view. *Men who aspire to be called "artists" (whether they use the brush or the camera) must study most carefully the laws of composition* to which I have alluded. In some persons a taste for composition seems to be intuitive; but I am afraid that the majority of photographers know very little about the matter, and therefore I believe that a photographic society causing lectures upon this subject, with illustrations, to be delivered to its members might have the certain assurance that the true artist-spirit would gladly hail and eagerly apply these laws of grace and beauty.

As the mechanical appliances of the art are continually undergoing change, it is very desirable that all the best forms of apparatus should come under the notice of photographers; and I believe that it is quite within the province of a society to invite the makers of instruments to forward, from time to time, specimens for inspection: there is no doubt that such request would be complied with, as being mutually advantageous to the maker and consumer. The same would apply to specimens of collodion, or to any new photographic material, which might be referred to a committee for experiment, and reported on according to its merits.

One more point: I believe that there would be considerable advantages gained by photographic societies throughout Great Britain devoting some attention to recording in a book kept for the purpose all special objects of photographic interest in its own particular district. This matter (most valuable of its kind), at first fragmentary, could soon be linked together and tabulated, and being made accessible to tourist photographers, members of other societies, there might be a reciprocation of courtesies of the most agreeable nature—of topographic information, which is as valuable as it is generally difficult to get at.

I could name a hundred points of detail worthy of the consideration of this Photographic Society, but I think it best to keep to generalities; and when I see what has been done by members of this Society—gentlemen whose works are deservedly acquiring a continental reputation—I feel that it is but fair, not only that the efforts of the Society should be directed to the fostering of incipient talent, but that it should afford every facility for the advanced photographer to become acquainted with contemporaneous discoveries.

I know that in a manufacturing town there are certain difficulties to contend with in the carrying out the purposes of a photographic society; but I think these may be overcome by the employment of a moderate amount of energy. I can only say, on my own part, that I will spare no pains to render this Society efficient. I doubt not I shall have the cordial co-operation of the members of Council, as I trust I shall that of the members of this Society in general—so that we may at all events have the pleasing consciousness that "if we cannot command success, we can deserve it."

Mr. O. G. Rejlander moved, and Mr. H. P. Robinson seconded, a vote of thanks to Dr. Anthony, which was unanimously carried.

The discussion on the paper was postponed till the following meeting.

At the request of Mr. Turner, the Secretary read an article in The British Journal of Photography of December 2nd, bearing the name of Mr. C. A. Seely, prescribing formulæ for the manufacture of collodion. A short discussion took place, after which Mr. Turner promised to make up a sample of collodion as per Mr. Seely's formula, and offer some comments upon it at the next meeting, and also exhibit a filter which he was in the habit of using for his bath.

Mr. Rejlander laid upon the table a number of prints from negatives which he had recently taken. They were greatly admired by the members present.

A vote of thanks having been awarded to Mr. Rejlander, the proceedings terminated.

CHORLTON PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Society took place on Thursday, the 9th inst,—Mr. W. Griffiths, Vice-President, in the chair.

After the Secretary had read the minutes of the previous meeting, the discussion on the wet and dry processes was resumed, which, although interesting to the members, was not of sufficient importance to justify publication.

The usual compliment having been paid to the Chairman, the meeting was adjourned.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The Annual Meeting, Fourth Session, of this Society was held in the Religious Institution Rooms, on Thursday, the 9th instant,—Mr. A. Mactear in the chair.

In the absence of the Honorary Secretary, Mr. John Cramb, Mr. Ewing was called upon to officiate.

The minutes of the previous meeting were then read, but owing to the misunderstanding of a certain clause by some of the members, its approval, the official reports of the Secretary and Treasurer, the election of office bearers, a proposition in regard to a new rule by Mr. J. Jex Long, and others by Messrs. Spencer and Dodd, were postponed till next meeting.

Mr. Spencer next proposed two gentlemen as members of the Society, Mr. Anderson, Carlton Place Academy, and Mr. Edmund Brace, Glasgow.

As there was no paper read, a conversation followed, during which the Chairman took occasion to draw the attention of the members to the new arrangements for next year, which he hoped would benefit the Society greatly, viz., the lessening of the rate of subscription, and the extra inducement held out in the form of presentation prints, through the kindness of Messrs. Brown, Cramb, and Long, as intimated at the previous meeting.

Mr. Robertson then offered to print twenty-five complimentary copies from Mr. Brown's negative, and Mr. Mactear volunteered to press them in a superior style. These marks of respect towards the Society received the approbation of the members.

After the usual vote of thanks, the meeting was adjourned.

AMERICAN PHOTOGRAPHICAL SOCIETY.

The subject of the composition of the photographic image was brought before the December meeting of the above Society. We extract from the *American Journal of Photography* the discussion to which the introduction of the subject gave rise:—

Professor Seely having given an epitome of Mr. Malone's address *On the Composition of the Photographic Image*, delivered before the Photographic Society (London), in November last,

Dr Leeds said he had observed that the rocks in N. C., enclosing gold-bearing strata, were coloured or stained in a characteristic way, and that practical miners there were guided by such indications in their searches for new localities. These colours were modifications of the ruby-gold tin, and he had long suspected that they were due to the presence of gold, and perhaps in the metallic state.

The President: In May, 1858, I communicated to the *Philosophical Magazine*, the particulars of an experiment which seems to have some bearing on the nature of the photographic image. The experiment was this:—I put distilled water in a clear glass flask, and through the water diffused pure chloride of silver. The flask in this condition was placed in the focus of a burning lens twelve inches in diameter, arranged so as to condense the rays of a brilliant sun. The chloride of course was blackened rapidly, and in half-an-hour I judged the exposure had been long enough for my purpose of collecting sufficient of the blackened matter for examination. The black powder when freed from the water seemed homogeneous, but the test by the microscope showed that each little particle was only black on the outside: the power of the light had not penetrated the interior.

This blackened powder, when rubbed against the sides of a mortar with the pestle, gave a well marked metallic streak: it had not, however, the brilliant white lustre of silver, but a lemon-yellow tint. The powder also was not acted on by nitric acid, but when it was fused it became the ordinary silver. The black powder is, therefore, a metal, but not silver—at least not silver as we know it. It is probably silver in a passive or allotropic condition: it is not a sub-chloride of silver.

Mr. Johnson: Did you test the powder by weighing before and after the exposure?

The President: The quantity operated on was too small to be tested in that way. The non-effect of nitric acid is the prominent fact, and it was especially to this that I desired to draw attention by my paper.

Mr. Tillman then introduced the subject of his paper read at the previous meeting, *The Cause of Actinism*, mainly for the purpose of hearing the opinion of the President. It seemed to him important that as we trace all the phenomena of the solar spectrum to a common origin, the sun, we should be able to show how these phenomena, apparently so diverse and distinct, may be manifested through the action of a single medium, the ether. He therefore repeated the principal points he had made in relation to the different effects which may arise from the varying motions of ethereal molecules. His deductions were that, while light and colourisation were sensations arising from the harmonic relations of undulations, heat and actinism arose from the direct and transverse forces in these undulations.

The President concurred with the prevailing idea that light and heat were produced by certain motions in the assumed matter, called ether. Mr. Tillman's theory seems to suppose that the rays which produce the actinic effect are different from those which produce colouration and heat. It is a well-established fact that all parts of the solar spectrum have an action on the photographic plate. [The President here exhibited a daguerreotype plate on which was clearly shown the image of the spectrum, complete in all its points. The action of the red and yellow, however, seemed to be of a reversed order from that of the indigo. The daguerreotype was one of two made in 1841; its mate was presented to Sir John Herschel.]

Mr. Tillman: I would modify my deductions so as to admit that all the rays may give actinic effects; but, as the relative increase of the transverse velocity arises from the shortening of the wave, we must conclude that actinic force increases with the increasing frequency of undulations.

Dr. Reuben: In waves which can be seen we observe their lengths are proportioned to their amplitude, hence a difficulty would arise with regard to increase of a diverging force.

Mr. Tillman: The waves of ponderable fluids are controlled by the force of gravitation, which, in the case of water, is acting at right angles to the direct force. In regard to the action under consideration we can find no analogy between the earth wave and the air wave or the water wave.

Dr. Reuben: Yet the ether theory is built upon analogies.

Professor Seely: The tendency of modern science seems to be towards an explanation of all the phenomena of chemistry and chemical physics by the well known laws of mechanical philosophy: it may turn out that mechanical philosophy is the all-comprehending science. I would suggest that there may be sympathetic vibrations of actinism, and that in this direction we may find some clue to the reproduction of colour in the Becquerel process.

Foreign Correspondence.

Paris, January 10th, 1862.

M. Poitevin has just communicated to the Photographic Society of Marseilles a very interesting paper on various substances which are sensitive to light, and, consequently, capable of being applied to photography. In the first place M. Poitevin gives the results which he has obtained with alloxantin. In 1858 he had ascertained that a mixture, in equal proportions, of concentrated solutions of alloxantin and bichromate of potash, when applied to paper, was very sensitive to the action of light. With gums, the same mixture applied to stone gives no serviceable result. M. Poitevin sought to turn to account the unreduced chromic acid in those parts which are not acted on. The following are the two printing processes he imagined:—

First.—A sheet of paper coated with bichromate of potash and alloxantin is exposed to the light under a positive picture, and then plunged into a nitrate of silver bath. Chromate of silver is formed in the parts not acted upon. A very fine red-toned positive picture may thus be obtained, and then fixed by washing. The chromate of silver, however, undergoes a change after a few days, even in the dark; so, to render the image permanent, it is immersed in a not very concentrated solution of iodide of potassium. Iodide of silver and chromate of potash are immediately formed. The paper is washed in distilled water, and the iodide of silver is sensitised, and forms the image on the sheets being plunged into a very diluted solution of nitrate of silver. The picture is washed in several waters, exposed for a few seconds to the light, and then treated with a solution of gallic acid, which gives a very fine dark picture, afterwards fixed with salted water and hyposulphate of soda.

The second process consists in treating the paper (when exposed under a positive, as explained above) with a mixture of a solution of gallic acid and sulphate of protoxide of iron, or protochloride of iron, which is prepared when about to be used, by pouring into the sulphate of iron, dissolved, an excess of chloride of barium. Immediately a fine image is produced, formed by the gallate of iron in those parts in which the bichromate has not been decomposed. For fixing, a few washings in common water suffice. A very fine positive image is obtained, by treating in the same manner a glass coated with gelatine, dissolved in water, and to which has been added a mixture of alloxantin and bichromate of potash in equal proportions.

In the sun, the alloxantin precipitates the bichloride of mercury, and a deposit of protochloride of mercury is formed. On coating a sheet of paper with this mixture and exposing to the light under a *cliché*, the film grows dark in the insolated parts when the picture is plunged into ammoniacal water, or into water containing hyposulphate of soda.

Alloxantin gives greater sensitiveness to the perchloride of iron and to the ferrocyanide and ferridcyanide of potassium, which, when applied to paper, are only reduced very slowly.

Alloxantin and ferrocyanide of potassium compose upon the paper a pellicle, which grows green under the action of light, and is brought back to blue by acids.

To obtain an excellent positive paper, coat first with a solution of perchloride of iron and alloxantin, and dry in the dark. Then plunge this paper into a solution of ferridcyanide and alloxantin. This paper is very sensitive to the light. It takes, at first, a Prussian-blue tinge, which whitens if the exposure be continued. A solution of ferridcyanide gives to the parts acted on a very fine blue tone. The image must be washed with common water, and may be transformed into an ink design by being plunged into wate rcontaining gallic acid, with an excess of ammonia.

A paper coated with a solution of alloxantin, plunged into a nitrate of silver bath, and then dried, is very sensitive to the light, and may be employed for the printing of pictures that are to be afterwards developed with gallic acid.

M. Léon Vidal presented to the Marseilles Society some pictures obtained with Major Russell's tannin process, and made on the spot several experiments calculated to show the advantages of that method. Some glasses which had been sensitised on the 12th, and exposed on the 14th, of December were developed by him at the meeting of the 30th with pyrogallic and acetic acid, to which had been added a few drops of nitrate of silver. The development took place as well as on the first day. A glass, sensitised on the 12th, and exposed on the 30th, was developed with equal success.

M. Vidal purposes to pursue these experiments, and to repeat them publicly at subsequent meetings

Van Monckhoven has just published a duodecimo volume, containing many excellent things. It is entitled—*Traité Populaire de Photographie sur Collodion.* The work fully justifies its title, and will be received with favour. ERNEST LACAN.

CAUTION TO PHOTOGRAPHERS' ASSISTANTS.—At the Manchester City Police Court, before Mr. Ellison, on Monday, the 30th ult., a working optician, named Edward Donovan, was charged with appropriating to his own use the time and materials of his employer, Mr. J. B. Dancer, the well-known optician, Cross-street. From the evidence it appeared that the prosecutor's suspicions were, in the first instance, aroused by the disproportion between the proceeds of his business and the expenditure attending it. During the scrutiny which ensued, the name of Mr. J. J. Pyne, chemist and druggist, also well-known in connexion with photography in Manchester, was imported into the case, he having employed Donovan to execute work which was done in Mr. Dancer's time and with his materials. With a view to elucidate the matter further, the prosecutor, through a friend of his, caused a camera to be sent to Mr. Pyne's, with instructions to have the instrument fronted. It was proved during the inquiry that the work was executed by Donovan at his employer's expense and he returned the camera to Mr. Pyne, from whom he received 10s. remuneration. The camera was then delivered to Mr. Williamson, Mr. Dancer's friend, and hence the present proceedings. It was stated, during the investigation, that Mr. Pyne had infringed a patent of Mr. Dancer's, in consequence of the latter's *employé* having partially applied a peculiar mode of shutting off the light from the camera, and used peculiar stops, which were the patented property of Mr. Dancer. After a lengthened inquiry, the prisoner, by the advice of his counsel, pleaded not guilty, and he was committed for trial. Subsequently Mr. Pyne made a statement to the effect that the accused had applied to him for work, which he had given, but had not the remotest idea that the work was not done in the prisoner's own time and with his own materials. It is only fair to add that the tenor of the evidence justified that impression.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE POSITION ASSIGNED TO PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION OF 1862.

To the EDITOR.

SIR,—It is sincerely to be hoped that the position of photography in the forthcoming Great Exhibition of 1862 may not operate to its detriment. But, at any rate, it will be only temporary; for, the longer the subject is thoughtfully considered and handled, the more certain will be the conviction that it cannot be permanently excluded from ranking among the fine arts. That photography must to a certain degree be mechanical is willingly conceded, but so also is painting and sculpture; and we are therefore not surprised at the saying of Sir Joshua Reynolds, "that he worked harder than any day labourer." Who can doubt, then, that the progress of painting a picture is "mechanical?" But the question arises—Why is a certain degree of contempt thrown upon the practice of photography, which, in so far as it produces its desired result quicker than painting, is still *less* mechanical? In reality, there is something more dignified in dealing with the great source of light and heat than in using substances compounded from the vegetable and mineral world, though these produce colour and the other only light and shade. First, it may be said, that photography is vulgarised from the immense proportion of those who practise it as compared with painting and certainly with sculpture. In Paris alone they are said to exceed many thousands. Next the *soiled hands* have a great deal to do with the matter; and lastly the very *facility* with which the operation is performed is prejudicial to its dignity as a fine art. In all great mechanical inventions, with their subsequent improvements, rapidity of production is specially aimed at, and in these stirring days they would be valueless without it; but this very circumstance reacts unfavourably upon photography, the greater part of the world being unconscious that the photographer who wishes to obtain excellence must exhibit nearly the same combination of excellencies as are required to make a good painter, though they are *exhibited* in a somewhat different manner. It appears to me that a due consideration of these circumstances would incline those who have hitherto paid little attention to them to come to the honest conclusion that photography *is really* a fine art, to which the world is more indebted than many are even yet willing to allow.

Such an invention must necessarily produce a great effect upon the other arts—generally, it is to be hoped, for good. "The value of photography"—as Mr. Petit remarks in the preface to his *Architectural Studies in France*—"in conveying architectural character, combined with the most faithful accuracy of detail, is universally recognised. It is applicable both to general outline and to minute ornament. It will never supersede the work of the sketcher; but it will work hand in hand with him, and assist him, and above all it will keep him up to the mark in his own work, for he will scarcely venture upon inaccurate representations with such a monitor by his side. But the superiority of photography is so great over *any* manual drawing that we can hardly expect that the latter will be practised, except in the instance of those who make 'working' drawings and architectural plans 'professionally.'" Here then is a boundless field for the art. And I think it must be admitted that wood engraving has progressed very rapidly of late years, owing to the peculiar accuracy of photography; and, beautiful as are the drawings of Roberts, who has delineated so many striking scenes in the Holy Land, we feel that they are not quite satisfactory when compared with those by Frith and Robertson. Again: the copying of prints by photography is not one of the least of its advantages, with the additional circumstance that on a reduced scale the effect is much increased by the lines in the original engraving being almost imperceptible in the copy, so that, when skilfully managed, there is in some degree the appearance of an oil picture.

And much as we value the vigorous lines from the engraver's hand, and still more such admirable sketches of the old masters as may be seen in the Louvre, it must not be forgotten that photography is more true to nature by presenting *no outline at all!*

It must, however, be acknowledged that in one respect "sun painting" is likely to prove prejudicial to art, unless some reticence is used. From it pre-Raffaeleitism, as it is called, has received an additional impulse, consequent on the exact truth of delineation which accompanies it. A writer in the *Guardian*, animadverting on the French Exhibition of last July, remarks that the *Charlotte Corday* of Paul Baudry, clever though it is as a whole, was looked at and admired for the really remarkable manner in which the slopping over of the water on to the floor of Marat's last bath was depicted, and for the details of the rush-bottomed chair, and the extreme truthfulness and manifest care with which the newspapers and other adjuncts which lay around are painted, than for the representation of the historic scene itself. "The same"—as the writer well observes—"might be asserted of many other subjects also, and the same conclusion drawn from them as from similar characteristics in our own school, viz., the tendency which they seem to denote in the efforts of modern art to *paint down* to these details, and to this careful observation of minute nature (a thing excellent in itself) rather than to paint by and through such a process *up to* designs of higher quality." It is sincerely to be hoped that photography may not prove a snare in this respect, or a hindrance to the cultivation of *genuine* high art.

Before concluding, may I remark upon a circumstance apparently unimportant in itself, but which may have some advantageous effects on photographic prints, in bringing them out more effectively? I allude to the *form* in which they are cut, which is almost universally *square*, merely in accordance, it is to be presumed, with ordinary custom. The *oval* has, I believe, been adopted in a few instances, and has been recommended for adoption at one of the London societies. It would, I think, be exceedingly effective in *small* prints; and, if they were mounted on a paper of a *somewhat dark colour*, the oval shape would then almost produce to the eye of a spectator the "appearance of a landscape *seen through a window.*" Many years ago the model of a room in the house of an opulent Chinese was exhibited in the exhibition of productions from that country, and in this the windows were represented in an oval shape, according to the national custom, with a distant landscape, a river, and boats intervening. The effect, as I recollect it, was uncommonly novel and pleasing—in fact, it would be so, for the shape of the human eye is *not* square. I am, yours, &c., H. P.

Cheltenham, December 16th, 1861.

PORTABLE BACKGROUND.

To the EDITOR.

SIR,—I am going to make a portable background for portraits (half plates and smaller), in the open air, and should feel much obliged if you, or any amateur reader of your excellent Journal, would tell me the full particulars how to make it, *i.e.*, the height and width, of what material, what colour, the height and *width* of the two sides or wings, the arrangements over head and width of ditto.—With best thanks for past favours,

I am, yours, &c., AMATEUR.

January 6, 1862.

[Make a framework of wood 1½ inches broad and ¾ inch thick, the framework to be seven feet high and four feet wide *at least*. Make also two similar frames the same height and half the width of the preceding, and attach the two smaller frames to the larger one by stout webbing hinges, so that they will fold together either way A fourth frame made lighter (say of wood one inch by half an inch) and of dimensions four feet and two or three inches *square*, is to be hinged on to the top of the larger frame. The last is to be covered on one side only with thin white calico, the other three frames with unbleached calico sheeting on *both* sides. One

side can be then covered with brown paper, or be painted of a neutral tint; the other side can be covered with paper having some design thereon, such as a balustrade, a bookcase, or anything to suit the fancy. It will be found that the whole is capable of being folded flat for packing away. To set it up for use, having selected the side you intend to employ, bend forward the "wing" on the side you wish to shade your sitter, and the other "wing" bend backwards: this will make the screen stand alone. Now turn over the top piece, making the front rest on the forward "wing" at one of the angles, and this will form a sufficient shade over the sitter's head. Of course if you can find room for a larger screen there is no objection to your increasing the width of all the portions. Do not use a diagonal piece of wood to support the frame, as it is apt to show in your picture, although covered over; but you may strengthen the frame, if needful, by short pieces of about six inches long at *each of the angles* of the frame, thus  .—Ed.]

PRINT WASHING.

To the Editor.

Sir,—You ask how I have tested the stability of prints washed by my method? The following is an experiment to which I have subjected them frequently with constant results. I may here mention that for convenience I suspend the print by two varnished wire hooks attached to a slip of wood, which lies across the baths: this does away with fishing for and fingering, it also serves for draining and drying, the prints, with the assistance of two lines, twelve inches apart, for the ends of the sticks to rest on.

Experiment.—Cut a fixed print in half, from sky to foreground. One half is suspended in the vertical bath, the other half in a pan six inches deep, with a net stretched across at two inches from the bottom, upon which the half print lies: the same supply of water furnished to each, viz., fifteen gallons per hour being the quantity. At the end of—

First hour:—

Each piece drained. Nitrate of silver test applied.
The half from vertical bath call No. 1.
The half from horizontal bath call No. 2.
No. 1. Slight presence of sulphur.
No. 2. Very perceptible, also, to taste.

Second hour:—	Silver Test	Permanganate of potash,
	No. 1. No perceptible trace.	presence of hypo. slight.
		Change.
	No. 2. Slight trace.	Not applied.

Third hour:—

	No. 1. No trace.	No trace.
	No. 2. Traces.	Fully evident.

Experiment No. 2.—No. 1. half cut in two, one part boiled in distilled water one hour, and dried: to appearance the two pieces when joined corresponded, sometimes the deep shadow a shade browner.

I continue the washing half-an-hour after all traces of hypo. have disappeared on applying the permanganate of potash test: as I do not find the prints fade, I conclude vertical washing to be very superior.

I am, yours, &c., H. R. NICHOLS.

January 3rd, 1862.

[There can be no question that the vertical suspension of the prints to be washed is an improvement upon the old method of merely laying them in a horizontal position.—Ed.]

STARCH-MOUNTED PRINTS.

To the Editor.

Sir,—In your number of December 2nd is a report of a meeting at which the difficulty of detaching starch-mounted prints from the card was discussed, and various modes referred to, such as soaking in water for twelve hours, rubbing the card at the back, oxalic acid, &c. All that is necessary is, after damping, to warm the back of the mount at the fire for a few seconds, when the print can be taken off without trouble or injury, on the principle that it is warm water that is used to dissolve starch. I experienced the difficulty the other evening, and was going to soak a print for the night, when a lady, who was present, suggested the above mode, and laughed at me for my ignorance of the use of starch.

I am, yours, &c., JOHN V. GOODWIN.

Bradford, January 6, 1862.

P. S.—I have not seen your Nos. for December 15 and January 2, in which very probably some of your readers may have communicated the above mode.

[In our number of 16th December, in reply to a correspondent, "C. Bell," we pointed out the fact now mentioned, and expressed our surprise that there should have been any discussion upon so simple a matter. Your note itself being evidence that, amongst the male sex at any rate, the behaviour of starch under the influence of hot water is not a familiar phenomenon, we print your communication for the general benefit.—Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In Mr. G. F. Eve's advertisement in The British Journal Photographic Almanac, for "Standard Pherms" *read* "Standard Thermometers."

C. O.—We will forward the note as requested.

C. Goldsworthy.—We unconsciously answered your query in our last number, which see.

A. R.—You will be received with pleasure. In reply to your last remark, see answer to "R. O. B."

Amateur.—We have no doubt that Mr. Morley, of Islington Green, can assist you to dispose of the lens.

G. T.—Your nitrate bath is evidently much too acid. Neutralise it with oxide of silver or liquid ammonia, whichever you prefer.

Salax.—Salicine has not been applied to photographic purposes, so far as we are aware. We have used it for display in the microscopic polariscope.

M. L. A.—We have made arrangements to give them; but they are intended by their author to be entirely remodelled first of all—and, in fact, re-written.

Timeo Danaos—Make a solution of cyanide of potassium, and drop into it tincture of iodine until it begins to be discoloured, and apply the mixture to the stains.

R. O. B.—We do not intend taking any further notice of such small game, not even to "make game of them"—a proceeding which they effectually do for themselves.

R. Craven.—Photographs can be sent by book-post to France at the rate of threepence per four ounces, prepaid. See new regulations which came into force on the 1st inst.

P. Reid.—Glass positives display an immense amount of beautiful detail, it is true, but the whites lack brilliancy to such an extent that compared with fine paper proofs they always appear dull and flat.

Tedium.—You are not obliged to read it. Please to remember that what is a bore to you may be (and we know is) sought for eagerly by others. It is not yet time to abandon art-teaching to photographers—very far from it.

Alex. Taylor.—We are obliged for your good wishes. We shall be happy to receive your promised communication just whenever it is convenient to you. Do not trouble yourself to be too particular about the "jottings;" send them as they are, and we will put them into "ship-shape" if needful.

Nemo me impune lacesset.—All very well to make a reply if you please; but why do you follow the example you condemn? We cannot insert the letter without considerable revision. Stick to facts only, and we do not mind; but omit your inferences, which we confess we do not think you are justified in drawing from the former.

M. D.—There is no essential difference between a portrait lens and one constructed for the *cartes de visite;* but those specially arranged for the latter have generally a somewhat longer focus and a flatter field—these modifications being attained by a *slight* sacrifice of rapidity and sharpness of definition. You will do very well with an ordinary half-plate lens.

Forgetfulness.—Our worthy brother editor of the *Photographic News* has apparently "forgotten" to make the usual acknowledgment for Mr. Bourne's paper copied from our pages. We have on several previous occasions had to notice a similar proceeding, which we have done privately, in the hope of its not being repeated, but without effect. We are therefore compelled to do so publicly.

J. Bray.—Your negative is not so deficient in detail as it is wanting in vigour and contrast of light and shade. The cause is probably absence of sufficient light, and you may take it as a rule that architectural subjects and landscapes are better in sunshine—the former especially are apt to appear flat and tame without it. If you have not varnished your negative, you may improve it somewhat by further development, adding some free nitrate of silver to induce a more dense deposit on the parts most acted upon by the light.

F. S. F.—We were only able to squeeze in a very short reply to you in our last, and that by telegraph, as we were just "going to press" when your note reached us. One of the chief objections to the use of a flat bath for sensitising large plates is their great liability to produce spots and streaks from the presence of dust or other fine particles in the solution, which, in a flat bath, are almost sure to settle on the face of the film. In a vertical bath, if these pests be present, they do not much interfere with your plate, as they sink to the bottom, and if stirred up by the introduction of the plate, unless the particles are very numerous, they subside again without injury.

A. Stewart.—Do not cumber yourself with too many at starting, but have them of first-rate quality. We should recommend a *pair* of those specially constructed for the popular *carte de visite* portraits, as they are termed. They should be mounted side by side in one camera, and the slide should be arranged for a "repeat"—that is, by using a plate about seven and a-half inches square, with two exposures four negatives will be obtained. This same arrangement will do also for stereoscopic portraits. In addition have a three and a-quarter or three and a-half inch diameter double combination of about eleven or twelve inch equivalent focus for larger-sized portraits, and you will have quite enough to begin with.

D. L.—1. A tumbler bottom will *not* do. 2. Chance is the best maker. 3. A single combination is preferable to landscapes. 4. Your focus is fully long—16 inches would be enough, and it would work more quickly and include more subject. 5. We have no practical experience in grinding lenses; but you may rest quite assured that the work which will do for astronomical, will certainly do for photographic, purposes. The lenses should, however, be a trifle under-corrected for colour, consequently by somewhat increasing the radius of your longest curve (30·8 in.) this will be accomplished, and the focus shortened at the same time. You are of course aware that the *convex* side of the combination must be turned towards your sensitive plate, and the concave towards the view, with a diaphragm in advance of it about 2½ inches. 6. It is not of much consequence which of the two specimens of crown glass you use, but choose that most free from striæ. 7. No work in existence on the subject. 8. To the persevering there are but few things impossible.

W. Francis.—1. No doubt your bath is overcharged with organic matter—probably a superabundance of ether and alcohol. Add a few drops of liquid ammoniæ, and shake it up: this will form a little oxide of silver in the bath. Expose it to sunshine, if possible, in a shallow flat dish; filter; and then make it *very slightly* acid with nitric acid.—2. Camphor in the alcohol would be fatal to its use in an iron developer, if intended for a glass positive picture; and we should hesitate about its use for negatives.—3. Peroxide of iron is to be purchased at almost any druggist's under the name of "jewellers' rouge." It is made by throwing down the protoxide from sulphate of iron, by means of a caustic alkali, and the precipitate exposed to heat in a crucible for some hours with free access of atmospheric air.—4. The eliphantinon process is a method of *painting* on photographs.—5 Dammar resin is not common resin: it can be obtained at the drysalters'.—6. The back combination of a portrait lens is *not* fitted for landscapes.—7. Alcohol spoils it.—8. Much too difficult for a novice.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* George Shadbolt, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 159, Vol. IX.—FEBRUARY 1, 1862.

Photo-Micrography.—In our last volume, p. 378, is an article of a practical nature, the result of eight months' steady experimental work, from the pen of Professor O. N. Rood, of Troy, New York, upon the subject of photographing microscopic objects. Photo-micrography is, as the learned professor justly remarks, generally acknowledged to be a valuable means of accurately recording observations; but we are not surprised that only a few working microscopists have adopted it, for the simple reason that the inherent difficulties render the records when obtained, *as a rule*, of comparatively little value to others than microscopists, while drawings, even if inferior in accuracy, can at least be made so as to appeal to everybody. As this gentleman is evidently working in earnest at the subject, and as it is one of considerable interest, we propose alluding to a few points in his paper in which our experience differs somewhat from his own, with a hope that he will continue to prosecute his experiments, and put to the test the suggestions which we shall offer.

We notice that Professor Rood finds he can work with advantage when employing only an objective without any eye-piece for enlargement, with the sensitive plate as far as *five feet* from the object glass. With artificial light we found that though a tolerable image could be formed at this distance with an objective of not shorter than $\frac{2}{3}$-inch equivalent focus, yet it was not equal in definition to one obtained at about *three* feet distance, while with the higher powers this difference was still more marked in character; consequently we regard *three feet* as the maximum distance that it is at all advisable to adopt. The reason why the lower powers do not display the same relative amount of difference in result as is noticed with the higher powers when applied in the two respective positions, is their general difference of construction—the former consisting of two achromatised pairs, so arranged that the anterior combination transmits a pencil of rays through the posterior one in such a manner that an error in one direction arising from irrationality of incidence upon the first is exactly counterbalanced by a corresponding error in an opposite direction by its transmission through the second. Object glasses of higher power are not constructed upon the same principle, and consist generally of three or more combinations, comprising sometimes as many as *nine* distinct lenses.

The discrepancy between Professor Rood's experience and our own may possibly be explained by his use of the direct solar rays, which fall nearly parallel upon the object glass, while with artificial light—it being imperative to employ a condenser—the rays are incident upon the object at varying degrees of obliquity. We have no hesitation in advising the abandonment of "the door on hinges carrying an achromatic lens for the purpose of magnifying the image formed on the ground-glass while focussing," employed by Professor Rood, as being far inferior to a Ramsden's eye-piece for the same purpose, and which can be mounted so as to be applied directly and centrically upon any part of the image. For a description of this arrangement see this Journal for October 15th, 1858.

With regard to the importance of the most careful attention to the illumination both in degree and kind, we fully endorse what Professor Rood asserts upon the point; but we would even add something thereto. For sunlight a mirror is a *sine quâ non*, but with artificial light it is only an incumbrance and an absorbent of much actinic power. In this latter case there is no difficulty in placing the *source of light* accurately in the axis of the instrument, thus avoiding the loss by reflexion. The arrangement of the condenser is a matter of the highest importance, as intimated by the learned Professor; and we have no doubt that the Wollaston doublet which he describes as having employed proved very efficacious. But, although he has evidently apprehended the necessity for limiting the angular aperture of the condenser, as evinced by his mention of the diaphragm plate in connexion with it, he has omitted to point out the fact that in no case must the effective aperture of the condenser be permitted to exceed that of the object glass in use therewith; and, further, that in reducing the aperture of the condenser it is equivalent to a reduction of the angular aperture of the object glass itself. This is a very important fact to bear in mind, but one that is not generally understood.

Regarding actinic correction we are pleased to find that our experience is corroborated by that of Professor Rood; and we do not regard the absence of coincidence of the visual and actinic foci of the microscopic objective of much importance, because the allowance once ascertained remains a constant quantity, provided that we always work at the same distance between the sensitive film and object—an arrangement which is practically most convenient on many accounts.

The results obtained by Professor Rood are sufficiently extraordinary, but there is one statement which he makes that we do not know how it is possible to reconcile with known facts, without the assumption of some error of diction in his paper. He mentions having obtained with a $\frac{1}{7}$ object glass of 113° aperture, and a Wollaston doublet of 44° aperture—consequently with what is in fact equal to a $\frac{1}{7}$ inch objective of 44° of aperture only, as we have already shown—"sharp negatives of the *Pleurosigma angulatum* magnified 1300 diameters with well defined hexagonal markings." So far, though this is something to have achieved, we have no doubt of the accuracy of his observations; but he continues by alluding to the fact that our friend Mr. Wenham had discovered by aid of a $\frac{1}{50}$-inch objective that the markings to which allusion is made are really due to *spherical particles of quartz*, and following in the wake of this idea subsequently announces, when alluding to photographing microscopic objects under the influence of *polarised light*, the following, which we quote, viz.:—"The perfection with which this apparatus (which he describes) operates may be inferred, when I state that photographs of the cross and rings in starch granules *as well as of the Pleurosigma angulatum in a dark field* were obtained by me without difficulty. Van Mohl remarks that with inferior apparatus some very distinguished observers have been unable even to *see* these appearances." We cannot forbear asking—Is it possible that this statement can be other than an error arising from a complicated involvement of phraseology? We have studied the passage over and over again, and can make nothing

else of it than that it is intended to be inferred that photographs of the *black cross* exhibited by the action of polarised light upon the *spherical particles of quartz* forming the markings of the *P. angulatum* have been obtained, as well as of those produced in a similar manner upon the starch granule. We must, however, demur—first, that microscopists do not by any means concur in accepting Mr. Wenham's conclusion relative to the supposed *spherical particles*. We have personally examined the object in question with Mr. Wenham's own objective, both adjusted by himself and independently of his manipulation, and, though we have a high opinion of his skill and powers of observation generally, we consider that in this instance at least he *misinterprets appearances*.

But be it as it may on the point at issue, even supposing the spherical particles really to exist, there is not the smallest ground for presuming that any "black cross" would be produced on them by polarised light, and if produced that it would be visible, in consequence of the excessive minuteness of the said spherical particles, which, be it remembered, are so minute that it is questioned by the majority of observers whether they are spherical. But perhaps a stronger reason for objecting to this assumption of a photograph of the black cross, under the circumstances described, having been really effected lies in the fact that the entire organism of *P. angulatum* (or indeed of any of the *Dictomaceæ*) does not exert any depolarising action upon polarised light at all, and that consequently it is not visible upon the dark field produced by "crossing" the polarised analyser.

Of these facts we were well assured from many years' experience with the microscope and especial familiarity with the object named. But we determined to go over the whole matter again before writing this article; and, having devoted no inconsiderable amount of time to the verification of our previous experience, we finally brought the whole question before a pretty full meeting of the Microscopical Society, upon which occasion our experience relative to the non-depolarising power of the siliceous articles of the *Dictomaceæ* was corroborated *nemine contradicente*.

We have of late had several inquiries from gentlemen desirous of pursuing photo-micrography, and allusion has been made to the paper of Professor Rood by some of them: we therefore deemed it necessary to record a caution to those who may be intending to follow up the pursuit in the particular direction which appears to be pointed out by him, lest they meet with serious disappointment; and we have thought it due to the learned Professor not to attempt to controvert his assertion without taking the precautions we have done. We are convinced that there must be some misapprehension relative to the matter somewhere, but where it is we are at present unable to say precisely.

Iron-Printing Process by Mr. Reynolds.—It is quite clear that, with reference to this so-styled new process, we have been caught "napping," and we have no compunction in admitting it; for truly it requires one's memory to be of the bestand one's attention always on the alert to avoid being misled by some of the thousand and one new (!) photographic discoveries that are constantly being promulgated. Some of our friends have, no doubt, an exceeding relish for the process of "waking up" the editor; so we must just take it quietly, remembering what the sturdy farmer remarked when condoled with on account of his being well drubbed by his wife and mother-in-law—"What's the consequence! it pleases them and don't hurt me!"

First comes Mr. Hannaford, who, in the pages of our contemporary, the *Photographic News*, marshals against us the names of Sir John Herschel and our old contributor, Mr. Burnett, as having both suggested the use of peroxalate of iron as a basis for silver printing, though, with reference to the latter-named gentleman's experiments, Mr. Hannaford says he cannot recall the where and when. And next comes our worthy contributor, Mr. J. T. Taylor, who has a quiet shot at our drowsiness in our own columns (see page 43). In addition to the two experimentalists already named by the former, Mr. Taylor adds to them that of Dr. Halleur; so that we take it the question is pretty thoroughly settled that, so far as the use of ammonio-nitrate of silver for developing the image formed upon a sensitive surface prepared with per-oxalate of iron is concerned, there is not the faintest shadow of ground for calling it a new matter. Of this we frankly admit we were oblivious until it was recalled to our recollection; but, having been recalled, we now distinctly remember the circumstances attending the suggestion by Mr. Burnett, and the fact of this salt having been employed by Sir John Herschel.

With reference to the combination with oxalate of ammonia we have some idea that this also entered into Mr. Burnett's proposition; but we are not aware that it had for its special object the preservation of the integrity of the half-tones of the image. With the evidence at present before us, we think that Mr. Reynolds is entitled to credit for his demonstration, if not first discovery, of this fact—one which, if capable of being fully established, is of considerable value, and, in our opinion, well worthy the careful examination of all engaged in photographic printing.

International Exhibition.—Possibly ere these lines are before our readers' eyes, some of them will have received notice of an allotment of a very small portion of space in the apartment to be devoted to the exhibition of photographs at Kensington Gore. We regret to find that the entire wall space is limited by the Royal Commissioners to 3000, and the floor to 500, square feet; and what makes the matter more obnoxious is the fact that the promised *separate apartment* turns out to be only the half of one, about 150 feet in length, the remaining half having to be occupied by the Educational Committee. As a further aggravation, lenses, chemicals, cameras, and all the mere mechanical appliances are to share the small space that has been accorded; while the unity of a photographic department is utterly ignored, the foreign productions being excluded from being brought into immediate contact with those of their English competitors. These mis-arrangements are entirely the work of the Royal Commissioners: the Photographic Committee is not responsible for them, the latter body having strenuously exerted itself to the utmost to procure their rectification. We confess that we are scarcely surprised at the result: it is too clearly in accordance with the spirit that has been displayed throughout in the proceedings of the Royal Commissioners towards photographers.

We understand that one of the principal impediments towards the attainment of more consideration from the Royal Commissioners under which the Photographic Committee laboured, was the very unreasonably large amount of space for which photographers applied as a rule, while some of the individual demands were simply preposterous. It has already been stated that one asked for 20,000 square feet: another, a dealer in apparatus, who was comparatively modest, wanted a counter of about ninety feet long by six feet broad. Again: it has been pretty clearly ascertained that some asked for space for the purpose of subletting it, to exhibit articles for others—a course of proceeding not to be tolerated for a moment.

Under these circumstances we cannot wonder that photographers were somewhat regarded with an eye of suspicion; but, even taking all these things into consideration, we do not think there was sufficient justification for the very supercilious treatment that they have received.

We have been informed, upon authority, that the French photographers declined to have their works classed with the fine art productions, and that their wishes had much weight with the Royal Commissioners. We cannot, however, avoid the impression that there must have been some misapprehension on this point, on one side at least; and, judging from what has elsewhere occurred, we do not apprehend that the Commissioners would have been so very complaisant as to have yielded to the representations of our French brethren, unless their own views had been in entire accordance with the desires expressed.

There is a point to which we would specially direct attention—that is, that every exhibitor will have the privilege of suggesting three names towards forming a list from which the Commissioners will select a certain number to act as *jurors* in the class; and we desire to impress upon exhibitors the importance of not putting down the names of any persons for this purpose except those in whom they feel that full confidence can be placed to act unbiassed by any kind of influence except knowledge of the art and perfect impartiality.

The following is the form of notice of allotment of space which is about being issued:—

INTERNATIONAL EXHIBITION, 1862.

Class 14.

Notice to Exhibitors.

No letter can be attended to which is not headed with the Number of the Class in which the Exhibitor's works are to be shown.

Her Majesty's Commissioners.

The Earl Granville, K.G., *Chairman.*

The Duke of Buckingham and Chandos.	Thos. Baring, Esq. M.P.
Sir Charles Wentworth Dilke, Bart.	Thos. Fairbairn, Esq.

F. R. Sanford, *Secretary.*

Offices, 454, West Strand, London, W.C.

1862.

Sir,—I have the honour to inform you that having considered the report of the Committee, to whom your demand for space in the forthcoming Exhibition was referred, Her Majesty's Commissioners will reserve for you an allotment of square feet for the hanging of photographs to be exhibited by you.

All photographs, both plain and coloured, intended for exhibition will be submitted to the consideration of the Committee, and will have to be delivered at the Exhibition Building, South Kensington, not later than the 31st day of March, 1862. You will duly receive instructions on this point.

Your attention is particularly called to the conditions* printed below, which must be strictly complied with.

I have to request that you will have the goodness to return the annexed Form with all the particulars asked filled in, and signed, within ten days from this date. If you fail in this particular the allotment now made to you will be withdrawn, and applied to meet the numerous pressing demands made upon Her Majesty's Commissioners for accommodation in the building.

I beg to call your special attention to the enclosed documents referring to the catalogues, and to point out to you the extreme importance to the exhibitors themselves of such early assistance being rendered to Her Majesty's Commissioners as will enable them to publish the several parts of the illustrated catalogue on the day fixed for the opening of the Exhibition. I have the honour to be, Sir,

Your obedient Servant, F. R. SANFORD, *Secretary.*

*Conditions.

1. All plain photographs must be framed and glazed in plain ¾-inch bead frames, and no other description of frame and no passe-partouts will be admitted. The margin must be kept under moderate limits, not exceeding for large pictures 2½ inches, and for those under 8 by 6 inches 6½ inches. If desired, several photographs may be exhibited in one frame.
2. No "touched" photographs will be admitted.
3. All coloured photographs must be framed and glazed with a careful regard to economy and space, or they will not be exhibited.
4. All photographs must be numbered, and accompanied with a statement giving the name of the photographer, the subject of the picture, and the process employed.

PARTICULARS REQUIRED FROM EXHIBITORS TO WHOM SPACE HAS BEEN ALLOTTED.

N.B.—To be filled up, detached, and returned *within ten days, failing which the allotment will be cancelled.*

Class 14.—Photographs.

I.—*Engagement to occupy the space allotted.*

* hereby engage to occupy the space now allotted, and to conform to all the regulations that may be laid down by Her Majesty's Commissioners. (Signed)

Class 14.—Photographs.

II.—*Nomination of Jurors.*

N.B.—Not more than *three* names to be returned.

Decision 11 (*f.*) The British jurors will be chosen in the following manner:—

Every exhibitor will name three persons to act on the jury for each class in which he exhibits, and, from the persons so named, Her Majesty's Commissioners will select three members of the jury for each class.

	Name of proposed Juror.	Address.
1		
2		
3		

Class 14.—Photographs.

III.—*Particulars required for Shilling Catalogue.*

Name of Exhibitor.	
Address.	
Briefest possible Description of Articles to be exhibited.	

The name, address, and description must not together exceed 16 words.

Class 14.—Photographs.

IV.—*Illustrated Catalogue.*

N.B.—Exhibitors intending to avail themselves of this Catalogue must fill up the following Table.

The Programme of mode of publication is enclosed.

Number of Pages. £5 per Page.	Number of ½ Pages. £3 per ½ Page.	Number of Lines.

* request that the above may be reserved.

(Signed)

* Here insert I, or We.

AN UNEVEN SURFACE OF CHLORIDE OF SILVER THE CAUSE OF MEALINESS IN POSITIVE PRINTS.

By W. J. C. Moens.

For some time past I have been convinced that the mealiness complained of in alkaline toning is almost entirely attributable to the way the prints are treated between taking them from the printing-frames and immersing them in the gold toning bath.

The usual treatment is to put the prints into two or three changes of water, in order to wash out the free nitrate of silver from them. Now this water nearly always contains inorganic matter, which converts the nitrate into chloride of silver, therefore the free nitrate is partially removed and partially turned into chloride. This chloride is left in the body of the paper, immediately under the albumen, which no washing can remove: besides this, the first and second waters are saturated with chloride, which settles in the open pores of the paper (this is the reason why a loose porous paper is more prone to the evil than a thin hard one).

It is therefore evident that, after washing in water containing inorganic matter, the paper on which the picture is printed has two conditions, being in fact mottled with an uneven surface of chloride of silver.

Now, after this washing, the next step is to immerse the print in the gold bath, and what is the result? When there is an excess of silver it is speedily toned, but the rest of the print takes a far longer time, so that you have two toning processes at work, both carried on for the same length of time: thereby you get two results, which constitute the mealiness complained of. Of course it does not show in *full force* till the print has been acted on by the hyposulphite of soda.

I will now bring forward a few facts which will tend to prove my theory:—

1.—Mealiness is never experienced with plain paper—the albumenised surface being *the* great obstacle to the proper removal of *all* the excess of the silver salts.

2.—Nor in the old method of toning when the chloride is dissolved before the toning takes place.

3.—Nor when you wash well with distilled water.

4.—It is very seldom experienced when you do not wash the prints at all before toning.

5.—Whenever there is an accidental excess of albumen, such as a streak running across the paper, or the edge of a sheet when the drainings have accumulated and dried,—these parts always tone quicker than the rest on account of the excess of chloride of silver.

6.—It is not so prevalent in thin paper, from which the silver is removed more easily.

7.—It never appears if the print be immersed in hypo., and the silver entirely removed before toning.

8.—If the silver be converted into an even film of acetate it never occurs, according to the testimony of many given during the last few weeks.

9.—When the silver is entirely reduced by exposure to a strong light it never occurs.

I repeat, then, it is absolutely necessary in alkaline toning to have an even surface of chloride of silver or none: in either case you get rid of the complaint. But, if you have a mottled and uneven surface of chloride of silver, the print tones accordingly, and the result is useless.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

CHLORIDE OF GOLD.

Synonymes.—Terchloride Gold. Perchloride Gold. Leo. ruber. Auric Chloride.

Composition.—Au Cl_3.

Equivalent.—308.

Preparation.—Gold-leaf dissolves readily in an aqueous solution of chlorine; and metallic gold, in a finely-divided state, when brought into contact with gaseous chlorine and heated, unites with that element, forming a compound of a deep yellow colour, which is the substance now under consideration. These methods of preparation are, however, not found convenient in practice: recourse is therefore had to a mixture of hydrochloric acid three parts, and nitric acid one part, called *nitro-hydrochloric acid* or *aqua regia.* This substance exerts a powerfully solvent action on metallic gold, and the resulting solution yields, on evaporation, chloride of gold. Theoretically speaking, one equivalent of gold, one equivalent of nitric acid, and three equivalents of hydrochloric acid, should produce an equivalent of terchloride of gold, three of water, and one of binoxide of nitrogen. The reaction may be represented by the following equation:—Au + NO_5 + 3 H Cl = Au Cl_3 + 3 HO + NO_2. Experience has shown that a much larger proportion of acid than the above is necessary, as the heat usually applied to assist the solution dissipates a great deal of free chlorine which has not acted on the gold; accordingly acid is added until the whole of the metal has entered into solution.

When the metal is completely dissolved, the highly acid liquor is evaporated to a suitable extent, and allowed to crystallise.

The amateur may sometimes be placed in such circumstances as to render it necessary that he should prepare his own chloride of gold, in which case more minute directions than the foregoing on this point would be found desirable. Let it be supposed that gold is not obtainable in any other form than that of the current coin of the country, and that it be required, for example, to convert a sovereign into chloride of gold. The coin should be placed (by preference) in a small glass flask—but any convenient vessel will do—and a mixture of three parts hydrochloric acid and one part nitric acid poured upon it; whereupon a very energetic action commences, accompanied by the evolution of large quantities of gas (NO_2), which is binoxide of nitrogen, and this passes by oxidation into (NO_4) or nitrous acid, evidenced by its characteristic red vapour. The solution soon acquires a deep yellow colour; but should the action appear to slacken, heat may be gently and cautiously applied, and acid added, until the solution of the metal is complete. The exact quantity of acid required for dissolving five pennyweights of gold (which is about the weight of a sovereign) cannot well be stated, as it depends so much on the strength of the acids and the amount of heat applied. The writer has generally found four ounces of metallic gold require from twelve to fifteen or even twenty ounces of the mixed acids for solution: this would give as the proportion for five pennyweights of gold about one and a quarter ounces, though it would be found to be probably more in practice. A clear yellow solution being at length obtained it should be evaporated to a small bulk, diluted freely with pure water, and solution of protosulphate of iron added thereto: the proportion is not important, so that the iron be in excess. The result of the reaction is the precipitation of the gold in a finely-divided metallic state, and free from the copper with which it was alloyed in the coin. The precipitate should be collected on a filter, washed, re-dissolved in a small quantity of nitro-hydrochloric acid, and evaporated cautiously to dryness on a water-bath, or until a drop of the solution solidifies on the end of a glass rod dipped into it. A sovereign weighs a little more than five pennyweights, *i.e.* about 123 grains, ten grains of which are copper: the remaining 112 or 113 grains of gold should yield, by combination with chlorine, about 170 grains of chloride of gold.

Properties.—Pure chloride of gold occurs as a red crystalline mass, very deliquescent, and freely soluble in water, alcohol, and ether. The ordinary commercial article, occurring in yellow prismatic or acicular crystals, contains free hydrochloric acid, and is described by Brande as a hydrochlorate of chloride of gold.

If this salt be dissolved in water, and treated with carbonate of soda until effervescence ceases, the hydrogen of the hydrochloric acid becomes replaced by sodium, and, on evaporation to dryness, a compound is obtained quite free from excess of acid, having a beautiful bright-yellow colour, and being especially suitable for the *alkaline gold toning process.* It is known in commerce under the name of *double salt of gold,* or double chloride of gold and sodium; and in its manufacture the addition of carbonate of soda is followed by the addition of chloride of sodium, the proportion being so regulated as to make two grains of the resulting compound equal to one grain of chloride of gold. It possesses the additional advantage of being non-deliquescent, thus enabling small quantities to be weighed at a time for the preparation of a quantity of toning-bath suited to the requirements of the moment.

It must be conceded that the combination of chloride of sodium with chloride of gold offers to the manufacturer a tempting opportunity for sophistication; but the best safeguard against that is to purchase the preparation from a house of acknowledged reputation.

Uses.—Chloride of gold is employed in the daguerreotype process and in the ordinary positive printing process to improve the tone or colour, and give greater permanence to the photographs. Its action in the former case depends on the deposition (over the whole surface of the plate) of a thin film of metallic gold, which greatly enhances the beauty of the picture, and communicates the properties above referred to. With regard to its action in the second case the opinions of chemists seem somewhat divided. It may here, however, be briefly stated, in explanation of the action of chloride of gold in toning (and these remarks refer especially to the alkaline gold toning process, now so generally practised), that a positive print, on removal from the pressure-frame, has an acid reaction to test-paper, arising from the traces of free nitric acid produced by the reduction of the nitrate of silver by the organic matter in the paper. The free alkali contained in the toning-bath would certainly have the effect of neutralising this acid; and, above and beyond this, it would have the effect of converting a portion of the chloride into oxide of gold (Au O_3)—a compound readily decomposable in the presence of the reduced silver already in the print, the product of the decomposition being reduced metallic gold, which is deposited in the dark parts of the picture. It should not, however, be understood that the interchange of gold for silver is complete throughout the entire body of the print, though little doubt can be entertained that the change, as above described, does *partially* occur. It seems essential also that the whole of the chloride of gold should not be decomposed by the addition of the alkaline salt, but that a portion should exist in the original condition; moreover, it has been ascertained that almost any salt, in which the alkali is imperfectly neutralised through combination with a weak acid, will answer the purpose, and hence the employment of acetate, borate, and phosphate, as well as the carbonate of soda. Chloride of gold is sometimes used to revive faded photographic prints, in which case a solution of about two grains to one ounce of water will be found suitable. The print should be immersed in this solution; and, if exposed to the full light of the sun, a few minutes are all that is necessary to effect a material restoration. The operation takes much longer in the dark, and, when completed, the picture should be again fixed in fresh solution of hyposulphite of soda, washed, and dried.

Impurities and Tests:—The principal contamination of this salt is hydrochloric acid, the presence of which may be inferred when the crystals possess a bright-yellow colour, the *neutral* terchloride being of a dark-red. If it be desired to separate the chloride from the hydrochloric acid, it may be done by treating the strong aqueous solution with ether, which takes up the chloride of gold, leaving the hydrochloric acid in combination with the water. The aurochloride of sodium, though more likely to be free from hydrochloric acid, is liable to the adulteration with chloride of sodium; and, as the determination of the extent to which this exists can only be accomplished by a quantitative analysis, it is deemed inexpedient to enter into an elaborate description of the means necessary to that end. The safety of the amateur consists in his purchasing the article from a house of acknowledged reputation.

Effect on Humanity.—This expensive salt is one not likely to be employed for the purpose of suicide: should its solution, however, be drank unwittingly and by accident, it would be found to be a powerfully irritant poison, acting locally like nitrate of silver. Its effect on animals is to produce ulceration of the mucous membrane of the stomach.

Antidote.—Magnesia, albumen, milk.

ON THE MEANS OF SEPARATING SILVER FROM THE HYPOSULPHITE OF SODA BATHS.*

By M. l'Abbé Pujo.

Every positive print, on immersion in a bath of hyposulphite of soda, yields thereto a considerable quantity of silver. It may indeed be admitted that the sky, the whites, and the middle tints of the picture compose at least one-half of the surface of a photographic

* *Cosmos.*

print, from which it follows that one-half of the silver with which the paper was charged has passed into the fixing bath. Further: in the most intensely dark portions of the print the greater part of the nitrate and albuminate of silver are not decomposed, and these salts again pass into the hyposulphite of soda bath. It may be affirmed, then, that *fifty per cent.* of the silver used in printing remains in the fixing bath; and, if the photographer have placed at his disposal a process whereby he can separate this silver, he will be enabled to effect a saving to that amount. I would propose, therefore, to my brother photographers a simple and certain method for the treatment of hyposulphite of soda baths.

Procure an ordinary earthenware jar, capable of holding about four or five gallons. Into this pour all the hyposulphite baths until they have accumulated to some bulk. When it is desired to separate the silver which they hold in solution, add thereto hydrosulphate of ammonia* in excess, and stir the mixture vigorously. An immediate precipitate of sulphide of silver is produced, which subsides to the bottom of the vessel after the lapse of a few hours. A small portion of the supernatant liquor should then be poured into a glass, and tested by the addition of a few drops of hydrosulphate of ammonia. If it blacken on the addition of this reagent, it is an evidence that sufficient has not been added to the general bulk of the solution; a further quantity must therefore be poured in, the mixture again stirred, and set aside for the precipitate to deposit. The testing operation is again repeated, and the addition of hydrosulphate of ammonia is again made until the supernatant liquor no longer blackens on the addition of hydrosulphate of ammonia. When all the sulphide of silver has subsided at the bottom of the jar, the supernatant liquor should be drawn off by means of a syphon, or carefully decanted, and the jar refilled with common water: it should then be stirred in order to wash the precipitate, and having waited for its agglomeration, the supernatant liquor is again decanted, observing to add this second washing water to that first drawn off. In this manner it should be washed four or five times, but these latter washing waters may be thrown away.

The sulphide of silver is collected, dried, and roasted sufficiently to get rid of moisture and sulphur in excess, arising from the presence of polysulphides in the hydrosulphate of ammonia, or through the decomposition of the hyposulphite.

A weight of powdered chlorate of potash, equal to that of the sulphide obtained is then mixed with four or five times its weight of chalk, to which mixture is then added the sulphide. The whole being intimately mixed, it is then introduced into the crucible and subjected to a bright red heat for fifteen or twenty minutes.

The mass which results from this calcination is treated with water: the chalk and the sulphate of lime which is formed will remain suspended for some time if the liquor be agitated, while the silver, which is in the granular condition, falls rapidly to the bottom of the vessel. It is possible, then, to separate the metallic silver by levigation from all foreign matters.

The grain silver carefully collected may be fused in a crucible and cast into ingots. The metal thus procured, which is very pure, may be again converted into nitrate, and be again allowed to pass through its numberless photographic metamorphoses.

N.B.—1. The precipitation of silver from hyposulphite baths should be conducted at some distance from the operating room, on account of the sulphuretted hydrogen liberated. 2. Chlorate of potash and sulphide of silver *explode* when heated together; the operator must not therefore forget to add a suitable quantity of chalk to moderate the action.

OPTICAL LAWS INVOLVED IN THE CONSTRUCTION OF PHOTOGRAPHIC LENSES.†

By W. K. Wason.

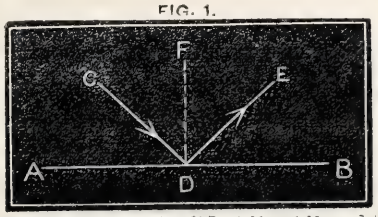
The science of optics naturally divides itself into two parts: First, the laws or principles which regulate the transmission of light, and second, the instruments formed on those principles; or first, the theoretical, and second, the practical, part. The first of these divisions has been allotted to me: the second is to be taken up in a future paper by our Secretary, Mr. Taylor.‡

When light falls upon a transparent body, such as glass, *three* things happen:—First, a small portion of the light is absorbed by the glass; second, a part of the rays are reflected from the surface; and third, the greater portion of the light passes through the glass.

Absorption.—Absorption is a most interesting subject of study and one which is engaging much attention at the present day; but, having little to do with photographic lenses, we will pass over it very gently. If all the light reflected from the glass, and all that passes through it, be again collected, it will be found that a loss has been sustained. Where this light has gone to no man knows: all we know is, that it is lost—as irrevocably lost as if it were utterly annihilated. This loss we call absorption.

One thing to be observed by photographers is, that loss of light is greatly increased by increasing the number of surfaces. This is one objection to triple achromatic combinations. But more of that anon.

FIG. 1.

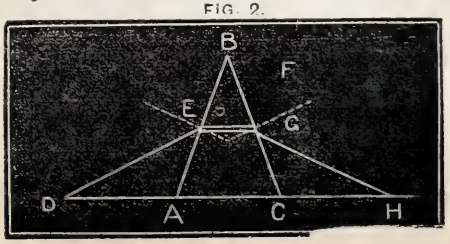


Reflection.—When a ray of light C D falls obliquely upon a polished surface, A B, it is reflected or thrown off in the direction D E. The ray C D is called the incident ray, and D E the reflected ray; and if F D be drawn perpendicularly to A B, the angle C D F is the angle of incidence, and D F E the angle of reflection. The only law to be remembered here is a very simple one, viz., the angle of incidence equals the angle of reflection, *i.e.* the angle C D F equals the angle F D E.

Refraction.—All are, no doubt, familiar with the wonderful phenomenon exhibited with "the half-crown in the basin." A person places himself so that the half-crown is just hidden by the edge of the basin—or, in optical language, so that the ray of light proceeding from his eye and passing over the edge of the basin, may strike the bottom of the vessel just beyond the half-crown. Water is now poured in, and the half-crown comes into sight. This is caused by the bending of the ray of light at the surface of the water. If a line be drawn perpendicularly to the surface of the water, it may be observed that the ray of light becomes bent *towards* this perpendicular at the point where it enters the water; and this holds good whenever a ray of light passes from a rarer to a denser medium. This one passes from the rare medium, air, to the denser medium, water. But now, if the ray be looked upon as passing from the coin to the eye—*i.e.* from the denser medium, water, to the rarer medium, air—the case will be changed. The ray, after reaching the surface of the water, bends from the perpendicular instead of towards it as before. And these two facts are all that require to be known for a popular knowledge of the subject—viz., that rays of light in passing obliquely into a *denser* medium bend *towards* the perpendicular, and in passing into a *rarer* medium bend *from* the perpendicular.

Lenses.—Let a tube be placed perpendicularly over a tub or other vessel of water, so as to command a view of some small object, such as a nail fixed at the bottom of the water. Let the water be whirled round by the hand till it becomes hollow in the middle and heaped up on the sides. The nail is no longer visible through the tube, the ray of light passing down the tube being bent towards the edge of the vessel. And as it can be shown in the same way that every ray of light that falls on the surface of the water will be bent towards the edges of the vessel, we conclude that *concave* lenses, or those thinner at the centre than at the circumference, *scatter the rays of light.* Let us now cut our section into two parts, and place them with the original outer edges in contact, and it will be seen that with a very little grinding we have a good convex lens, and that this *convex* lens condenses the rays of light. We can now classify lenses:—those thinner in the centre than at the circumference are diverging lenses; those thicker in the centre than at the circumference are converging lenses; and those equally thick throughout are, *with regard to their qualities*, entirely neutral.

FIG. 2.



* In the absence of hydrosulphate of ammonia, a solution of sulphide of sodium may be employed. It may be prepared in the following manner:—Evaporate to dryness in a basin three or four parts of the solution of hyposulphite which it is intended to treat. Pulverise the salt thus obtained with two-thirds of its weight of sawdust, and heat the mixture strongly in a crucible. The mass, treated with water and filtered, yields a solution of sulphide of sodium.

† Read at a Meeting of the Photographic Society of Edinburgh, January 15, 1862.

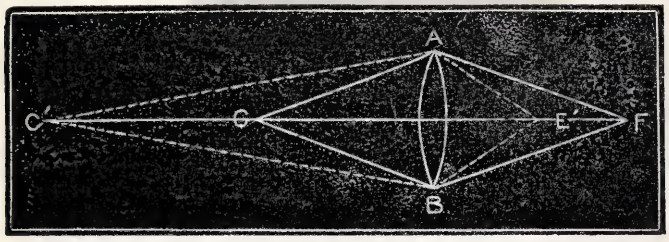
‡ And as my subject is thus subordinate to Mr. Taylor's, I have treated it according to directions received from him, viz., "to begin at the beginning and make it as popular as possible."

Prisms.—As the prism is the key to all the lenses, of whatever shape they be, we will now trace the passage of a ray of light through the prism A B C. Let A B C be a section of a prism, and D E a ray of light incident upon it. Instead of proceeding in a right line to F it is refracted or bent towards the perpendicular, and reaches the surface at G. Here, in passing from a denser to a rarer medium, it bends from the perpendicular and comes to H.

If the double convex lens be looked upon as two prisms placed base to base, the passage of the rays of light through it will be easily understood; and the double concave one will present no greater difficulties if looked upon as two prisms placed point to point. In both cases the rays will be bent towards the base of the prism.

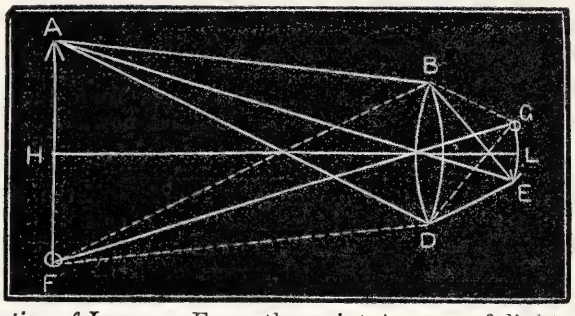
Focus.—The point at which a convex lens will bring to a focus the rays of the sun is called the *principal focus* of that lens, and the distance of this point from the lens is called its focal length. Hold the lens up to the sun, and mark the distance of the little spot of light from the lens: this will be the focal length of the lens.

FIG. 3.



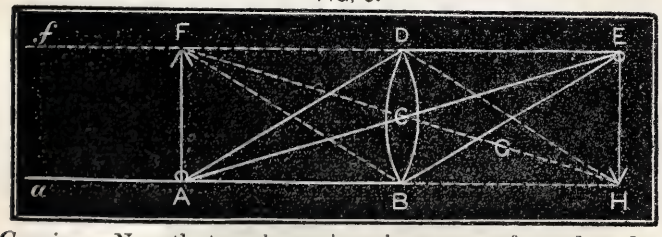
If light from the point C fall upon the lens A B (*fig.* 3), it will be brought to a focus at some point, F. The points C and F are called the conjugate foci. Observe that if the point C be removed farther from the lens, to C', the rays C' A C' B will be more nearly parallel than C A and C B, and will therefore be brought to a focus at a point F' nearer to the lens than the point F; and, generally, as one focus recedes from the lens, the other approaches it, and *vice versa*.

FIG. 4.



Formation of Images.—From the point A rays of light flow in every direction, forming a perfect sphere of rays. The lens B D intercepts a cone of these rays. This cone of rays is represented by its axis A C, and its two boundary lines A B, A D. From what we have already said of conjugate foci, it is clear that the point A will have its conjugate focus at a point E on the other side of the lens. A similar cone of rays will proceed from F, and have its conjugate focus at G; and a cone from H will have its focus in L; and from every point in the arrow cones of rays will fall upon the lens, and be brought to foci in the line G L E, forming there an inverted image of the arrow.

FIG. 5.



Copying.—Now that we know how images are formed, and something about the conjugate foci, we introduce the subject of copying and enlarging. Let the lens in *fig.* 5 be able to bring the parallel rays *a* B, *f* D, of the sun to a focus at the point G; and let an object to be copied, say the arrow A F, be placed at twice this focal length from the lens. A cone of rays from the point A will be intercepted by the lens. Let these rays be represented by the boundary rays A B, A D, and their axis A C. It is evident, that A B will be refracted equally with *a* B, and will, therefore, pass through the principal focus G. The ray A C passing through the centre of the lens will suffer no refraction, and will, therefore, pass on till it meets B G in E. It will be seen, also, that A D will come to E, the power which could bend F D to G being just sufficient to refract A D to E. The point F will have its conjugate focus in H; and thus an image of the arrow will be formed at H E equal in size to the arrow itself. We find, therefore, that to produce an image equal in size to the object we wish to copy we must place the object at twice the focal distance of the lens, and the image will be formed also at twice the focal distance. By removing the object more than twice the focal length from the lens, a smaller image will be formed; or, by placing the lens at less than twice the focal length, that a magnified image is obtained.

(To be concluded in our next.)

PRINTING BY DEVELOPMENT.

[The following paper, by M. Oppenheim, of Dresden, was read at a meeting of the Marseilles Photographic Society. We are indebted for the details to our contemporary, *Le Moniteur de la Photographie.*]

PREPARATION OF THE PAPER.

Serum of milk, prepared by treating scalded milk with tartaric acid for the purpose of coagulating the caseine, is clarified by means of albumen, boiled and filtered.

When the liquor is cold, five per cent. of iodide of potassium is added thereto, and it is filtered again.

(This serum of milk filters as freely as water.)

An equal quantity of similarly prepared albumen is added to the iodised serum, by which means an iodised liquor is obtained, on the surface of which the sheets of paper may be floated for half a minute, and afterwards dried.

Papers thus prepared will keep for a great length of time—indeed their qualities seem to be improved by age.

SENSITISING.

A sheet of paper, prepared as above described, is floated on a bath of nitrate of silver of five per cent. to which *no* acetic acid has been added.

[The author insists on this absence of acetic acid, because, according to his experience, this substance is not only useless for this process but positively hurtful. He admits that it aids the formation of a vigorous image for transparencies, but coarse and feeble when viewed by reflected light.]

After a minute's contact with the nitrate of silver bath the paper is withdrawn and floated *on the surface* of some distilled water contained in a flat porcelain dish, where it should also be allowed to remain one minute; after which it should be *plunged* into another porcelain tray containing a large quantity of distilled water: in this it should be allowed to remain five minutes.

The distilled water upon which the paper is first floated should be changed after washing three or four sheets: the second water serves for a greater number of sheets.

This double washing is necessary. The first should be effected by simply placing the sheet on the surface of the water, in order to avoid the spots of saline matter which attach themselves to the back of the paper if it be completely submerged on withdrawal from the nitrate of silver bath.

The albumen, in fact, not being sufficiently coagulated, becomes partially decomposed on contact with water, and the spots referred to are the consequence. This danger does not exist at the time of the second washing, which completes the operation, it being then only necessary to dry the sheets between folds of blotting-paper.

EXPOSURE.

The exposure should be effected in the pressure-frame: to diffused light a few seconds are sufficient. The image should be just faintly visible on withdrawal from the frame.

DEVELOPMENT.

This is accomplished by employing a solution of gallic acid, to which has been added a little glacial acetic acid and nitrate of silver.

The first washing water will do for developing if it be previously filtered through kaolin.

FORMULA FOR DEVELOPING SOLUTION.

Distilled water, with a little nitrate of silver...	100	parts.
Gallic acid	1	„
Solution, containing fifteen per cent. of nitrate of silver and five per cent. of glacial acetic acid.....	6	„

The development may be accelerated by the aid of heat, and when the proof has acquired sufficient vigour it is only necessary to stop the development by freely washing with water.

FIXING.

For this purpose a tolerably strong solution of hyposulphite of soda may be employed, and the immersion should be continued until the yellow colour of the iodide of silver has disappeared. The tone yielded should be a beautiful sepia colour, if the instructions here given have been accurately followed.

Where the tone becomes red it may be safely inferred that the time of exposure has been prolonged beyond what was necessary, or that the nitrate of silver bath employed was deficient in the silver salt. If it be desired, the print may be toned with chloride of gold, which yields a colour somewhat resembling galena.

ADVANTAGES OF THIS PROCESS.

1. Possibility of printing several hundred proofs in a fixed time, and in a number of hours which are sufficient generally to print only a very few by the ordinary method.
2. Possibility of obtaining equally good proofs from feeble and vigorous negatives, the character of the picture being so much under control in the development.
3. Great economy of nitrate of silver and chloride of gold.
4. Increased permanency of the proofs.

The proofs which accompanied this description were shown to the meeting and elicited the highest encomiums.

"NOTES," HARMONIOUS AND DISCORDANT, ON VARIOUS SUBJECTS.

By J. T. Taylor, Edinburgh.

A perusal of the volume of The British Journal of Photography for last year suggests such a variety of topics on which to descant, that were even an approximation to justice rendered to them it would cause these "notes" to extend to a most unreasonable length. Meantime, a few of these may be selected for the present observations, to which may be prefixed a word or two as to the appearance of the Journal itself.

When in January, 1854, the enterprising and practical Liverpool Society started a journal of their own, I wonder if it ever occurred to them that their modest though well-conducted organ would ever attain the gigantic proportions it now possesses under its improved name. There were some first-class men in the old Liverpool Society, with one of whom, Mr. Mackinlay (since Lieutenant), at one time the Secretary, I was privileged to be on somewhat intimate terms; and when I recently parted with him at the railway station, on his way to Canada, I felt that a man had gone from among us who possessed, in a degree seldom indeed to be seen, sound theoretical and practical knowledge of photography. I have always found The British Journal* * * * * * * I write this in perfect cognisance of all that transpires through the Continental photographic journals: indeed the quondam editor of the most important of them—*La Lumière*—I am glad to see has been for a considerable period on the literary staff of the British Journal. If Edinburgh be taken as a criterion, the circulation of The British Journal of Photography must now be very great indeed.

In the literary department it only wants one thing to make it perfect—which, even in the certainty of boring some readers, I venture to suggest should be done—viz., publishing, *in extenso* or in abstract, the specifications of all the patents obtained in connexion with the art. I have hinted at the possibility of some being bored by such abstracts. Need it be said that at the present day, as photographers are constituted, there are some who would growl at everything? In my hearing, a few days since, one young aspirant suggested that instead of having articles upon the "art aspect of photography" it would be far better to devote a few pages in each number to show how to prevent the bath from fogging, for that, he thought, was the most important thing in photography! "Nay," said another, "any child knows how to doctor a bath: the chief thing that is wanted is a good dry collodion process; and for my part I should not care were nothing else treated of in the Journal!" "Low grovelling ideas, both!" said a third: "A Journal of Photography should be mainly devoted towards the elucidation of the *principles* of photogenic action, leaving the readers to deduce the practice for themselves" —and so on. In the impossibility of moulding the Journal to suit the whims and caprices of each reader individually, it is doubtless wiser to retain it as it is, namely, with something to suit every kind of taste, from the metaphysical to the merely mechanical.

* We are obliged for the favourable opinions expressed, but they are too complimentary to publish.

Photography in Edinburgh.

Passing from the Journal itself to its contents, it indicates a general progress in the art. Although no new *process* has been discovered, some new societies have been formed; and perhaps the writer of this will be pardoned for calling special attention to the Edinburgh Photographic Society, with the formation of which he had something to do. Perhaps a slight explanation is desirable, seeing that at the time of its organisation another society, viz., the Photographic Society of Scotland, was co-existent in the same place. This latter Society, from which the greater proportion of professional photographers kept aloof, was, to a considerable extent, composed of persons of a somewhat high social standing according to the rule which decides those matters in this city of *castes;* and when, at the close of a paper, opportunities were offered for throwing in their quota of information to the general store, there was such an apparent reluctance to imparting any of their knowledge, that latterly conversations or discussions, which, if rightly managed, are the most valuable feature of the evening, were suffered to dwindle away to the necessary formalities. To organise a society where stately formality should be supplanted by pleasant and profitable conversation was the aim of the projectors of the Edinburgh Society; and whereas in our respected parent, the Photographic Society of Scotland, the absence of a paper might entail the necessity for postponing its meeting for a month, such an event would, in its precocious child, the "Edinburgh," be hailed with pleasure by some, as affording more time for the friendly interchange of opinions. While deprecating the most distant idea of fault-finding with the policy which the Council of the Photographic Society of Scotland deems it best to follow, those connected with the Edinburgh Photographic Society are still in the belief that the plan they are pursuing tends more to create an interest in the art than is done by the other. That there is no animosity between the two bodies is best evidenced by the fact of Sir David Brewster, the President of the Photographic Society of Scotland, having given his consent that he be proposed as an honorary member of the Edinburgh Society, in the list of the members of which his name now appears. This young Society now contains in its list of members between eighty and ninety names.

The New Photographic Printing Process.

When reading an account of this alleged new process by Mr. Emerson J. Reynolds, the sage remark of the ecclesiast that "there is nothing new under the sun" was forcibly impressed upon me. I at once recognised an old and favourite method of printing which was published with very great minuteness in *Weale's Rudimentary Series*—article "Photography"—in 1854. Mr. Reynolds's process of 1861 is so exceedingly like the other that, were not such cases of independent discovery far from being rare, it might lead one to the belief of the last discoverer having inadvertently received some of his ideas from the other source, while from the very style of Mr. Reynolds's communication I have no doubt of his being an independent and highly intelligent discoverer of this ferrotype process. I will transcribe and place in juxtaposition the two processes.

Dr. Halleur's process, as published in Great Britain in 1854 [Weale, London], is as follows:—Dissolve in water one or other of the following salts: oxalate of iron and ammonia, citrate of iron and ammonia, or tartrate of iron and ammonia, *the oxalate being best adapted for the purpose.* The paper being sensitised with this, after exposure in the printing-frame under a negative, is brushed over with a solution of red prussiate of potash, if a blue picture is wanted; *ammonia nitrate of silver*, if a greyish-black is wanted; simple nitrate of silver, if a blackish-brown is desired; and so on with other reagents, to suit the particular colour that is preferred.

Mr. Reynolds's new process is this:—Saturate paper with peroxalate of iron, dry, and expose under a negative. Develop with red prussiate of potash, and the resulting picture will be blue; but by the substitution of ammonia nitrate of silver a grey or black photograph may be obtained.

If memory serve me aright, the process in question emanates originally from Herschel *(vide Hunt's Researches on Light);* but of one thing I am very certain, viz., that Mr. C. J. Burnett, of Edin-

burgh, has explored this field of research in a manner that no other experimenter has done, and it is above three years ago since I received from him several sheets of sensitive paper, some of them being prepared with salts of uranium and others with *peroxalate of iron*, which Mr. Burnett recommended me to develop in the manner now claimed as new. But the publication in Weale's work, so long ago as 1854, sets the matter entirely at rest.

I can say, from personal experience, that this process possesses great value, from the variety of tones capable of being produced by it.

My next note will be one on a subject, in which considerable interest is felt by some. It may be entitled—

Undeveloped Images.

Some months ago, at a meeting of the Edinburgh Photographic Society, I stated that there might be a theoretical objection to the use of acetic acid in the developer, seeing that this acid can discharge an undeveloped image when used alone, and that even when mixed with pyrogallic acid it might have the same tendency. The Editor of this Journal, in the leader immediately following the number in which such remarks appeared, made some observations on this doctrine, to the effect that I should most likely not be inclined to endorse this opinion on more mature deliberation, seeing that the remarks were made in connexion with plates on which an organic body—albumen—existed in combination with silver, although that by its action on a plate *merely varnished* with such a body as gelatine a destruction of the latent image might take place.

Having made a series of experiments to decide this point, I am perfectly satisfied that the Editor was right, and that I was wrong. Under a great variety of circumstances, although acetic acid may remove with more or less completeness the impressed though undeveloped image, I find it will not do so when there is an albumenous combination, as in the case which called forth the remarks in question, which, if I mistake not, was Mr. Slight's paper *On the Hot Water Process*. Following out Mr. Shadbolt's hints as to the removal of such impressed image by iodine, I took a Fothergill plate which had been inadvertently left standing on a shelf exposed to the full action of daylight. After it had been thus exposed for some weeks, I cut the plate into three pieces—the first of which I treated with the ordinary pyro. developer and silver; the second with acetic acid, previous to the same treatment; and the third with a peculiar tincture of iodine which I use in the removal of stains, previous to treatment with the pyro. solution. The first two at once blackened, but the third showed no symptoms of having been impressed. Subsequently a beautiful transparency was printed on a film which had previously undergone a lengthened exposure to light, which picture, with a statement of the circumstances under which it had been produced, was submitted to the Photographic Society here. This subject is one of some interest, and I am waiting to see if any gentleman will be public-spirited enough to furnish a regular article on it. Curious things were done "in the days of old" by a knowledge that iodic and kindred fumes would so discharge an impressed daguerreotype that no amount of exposure over the mercury would suffice to bring it out. I still remember the day when an amateur of considerable pretensions had invited three or four less successful brethren to spend a day with him, to see him operate, with the amiable intention of "crowing" over them. It is still vividly before me how, time after time, he exposed—with no success — and I doubt not to his own profound amazement. The only cause he could assign was, that there must be electricity in the atmosphere, which prevented the possibility of a picture being taken! The real cause, however, was found to be that a young fellow present, who was desirous that his boasting friend should, as he expressed it, "have the starch taken out of him," had slyly conveyed a small quantity of iodine into the camera, where, lurking unseen, it produced its baneful effects of throwing a "wet blanket" over the too-confident operator.

CLEARING A SILVER BATH.*

By Coleman Sellers.

In a paper, by Edwin Musgrave, read at a meeting of the Edinburgh Photographic Society, Oct. 16th, 1861, *On Positive Printing*,† the following passage occurs:—"When the printing bath becomes discoloured by use, Mr. Tunny's method of decolourising it will be found the most certain. It is as follows:—Add one drop of saturated solution of citric acid to the bath, and shake it up. This, if the bath be alkaline, will cause a *slight* deposit of citrate of silver, *and will immediately clear the bath* (the italics are mine). The solution may then be filtered. If no deposit take place on the addition of the citric acid, it shows the bath is still acid. In that case one drop of ammonia added to it *will at once* produce the desired effect." When "Fault-Finder" puts his kaolin into his silver bath does it at once clear it, or does it not rather render it very muddy? and does it not become clear only after being filtered, or after the heavy clay has settled to the bottom, taking with it the colouring matter? The action of the clay, or the citrate of silver, or the chloride of silver, used by some, is purely a mechanical action, and clears the bath in the same way, without regard to the quantity used. When I read the very well written and interesting paper of Mr. Musgrave I never for one moment supposed that the word *immediately* meant that some magic effect should be produced, and that, *presto!* the dark colour should vanish.

"Fault-Finder" may be correct in thinking my description not sufficiently clear, and, for his benefit as well as others, I will endeavour to make it more so, premising that a silver bath acid with citric acid is not liable to be discoloured, particularly if there be from five grains to five ounces of citrate of silver in the bottom of the stock-bottle, and that this citrate is shaken up whenever the bath is returned from the dish into the stock-bottle. Now for the formula.

Let "Fault-Finder" make a saturated solution of citric acid in one ounce of water: to this add three drops of aqua ammonia, F. F. F. Now, if his bath contain five ounces of silver solution, let him add five drops of this acid citrate of ammonia to it, and note if a *slight* flocculent deposit forms. (In parenthesis let me say that I know of no measure to designate more nearly what I mean by *slight*.) Shake this up and filter. If this do not answer the purpose, let me advise "Fault-Finder," by all means, to stick to his kaolin as the very best method of clearing a bath; but at the same time let me assure him that I do not use kaolin, nor do any of my friends.

Thus much have I written to clear up the obscurity of my former article; and now, in all kindness, I would volunteer a word or two of advice to "Fault-Finder." The cook that tells you that, in making a potato-pudding, she uses eggs in proportion to the size of the pudding—that when she makes a big pudding she takes a good many eggs, and that when she makes a little pudding she doesn't take so many—is, in all probability, a better cook than one who must work to guage and number. She knows that an egg more or less is not a serious matter, and she has no fixed rule to work by; yet her puddings may be all first-rate. So it is with photography. There are many fault-finders who cannot work even to exact formulæ, for they do not, in the first place, try to understand and reason out the theory of the operation they are about to perform, and modify it to the circumstances of their own particular case.

Photography requires not so much exactness in weight and measures as it does in exactness of the knowledge of the effect to be produced—a knowledge only to be gained by experience. If "Fault-Finder" be an experienced photographer, and writes his strictures in a fault-finding spirit, I have nothing more to say; but if he be young in the business, and desires knowledge, let me advise him to select some other *nom de plume*—one more indicative of an earnest desire to learn—and he will find many persons always ready to help him. Photography is a very fascinating art, but those who want to succeed in it must keep in a good humour and exercise great patience; and as "Fault-Finder" advances in knowledge he will find that he has written what is not true in making the wholesale charge against writers for this and other journals of keeping back their knowledge from the public.

Most emphatically do I say that I have found all the processes published in this journal under responsible names correct in every particular as far as my limited experience would enable me to judge; and I here once more thank *Humphrey's Journal* for much valuable information, and find no fault even with "Fault-Finder."

* From *Humphrey's Journal*.

† See page 376, vol. viii., of The British Journal of Photography.

ON THE CHEMICAL EFFECTS OF LIGHT.*

By M. A. Poitevin.

All substances exposed to the action of light either absorb or reflect it more or less; and it is in this way that the *luminous* rays communicate to them brightness and colour. The *calorific* rays elevate the temperature of bodies exposed to their action; but in neither case is the nature or chemical composition of the bodies altered, while the third class of rays acting on certain bodies alters the molecular arrangement of their particles: these are the *chemical* rays. I propose, in this paper, to consider the effects

* *From Le Moniteur de la Photographie.*

produced by these rays; for it is these which furnish us with the various means of rendering permanent, or of printing on a suitably prepared surface, the luminous image projected thereon, or which is perhaps even momentarily formed.

It is necessary to this reducing action of light that the substance to be acted upon should be in contact or mixed with another substance capable of furnishing the element acquired in the act of reduction, and which will form a substance more stable under the action of light, and under the same conditions. For example:—

Hydrogen unites with chlorine under the influence of chemical rays. Bitumen of Judea, certain oils, guaiacum resin, are oxidised at the expense of the air, while, in a vacuum, or in an atmosphere of other gases, light has no action upon them. Guaiacum resin becomes blue in the chemical rays of the spectrum, and the yellow and red rays cause it to lose the oxygen acquired in the first.

Gummy organic matters become oxidised on exposure to light in contact with chromic acid and alkaline bichromates, and become thereby more insoluble in water.

With reference to the binary compounds decomposed by the action of light—those of gold and silver, oxides, chlorides, bromides, iodides, &c., especially those reducible to the metallic state—it may be said that the electro-negative element combines with some body present, or is liberated in the gaseous form: those of iron, uranium, lead, &c., in the highest state of oxidation, simply lose a portion of their oxygen.

Among salts the acid is sometimes decomposed: thus the chromic acid of bichromates and the nitric acid of nitrate of silver suffer decomposition when they are mixed with organic matter.

A similar reaction takes place in the case of the salts of the sesquioxide of iron and uranium, which, in passing into the state of protosalts, become energetic reducers of the salts of gold and silver.

But, as I have previously said, it is essential, in order that reduction shall take place, that the body be mixed with a substance in which at least one of the electro-positive elements shall unite itself to the electro-negative element which becomes eliminated.

These are generally substances of organic origin in which the affinities of hydrogen or carbon, which they contain, are not satisfied; they may therefore be regarded as combustibles, while the substances to be reduced occupy the position of supporters of combustion. Those substances which are already in a state of peroxidation—as gun-cotton, for instance—are not apt to facilitate reduction by light, and, therefore, it is possible to dissolve nitrate of silver, nitrate of uranium, perchloride of iron, &c., in collodion, and submit the mixture to the action of light without the least reduction taking place. I would direct attention to the fact that nearly all the substances decomposable by light are either of a yellow, orange, or red colour, or else one of their constituent elements possesses one of these colours. I may mention, as examples, chlorine, bromine, silver, gold, the bichromates, the persalts of iron and uranium, &c., &c., which have these colours, and are all sensible to light, or else form combinations decomposable by light.

Many white compounds, slightly sensible to light, or upon which it has no action, might, perhaps, become reduced if they could have communicated to them the power of absorbing the blue and violet rays; this, however, is an entirely new course of study to which I propose devoting myself, and to which I now direct the attention of experimenters.

I will not now enter further into these theoretical generalities. I propose to describe my experiments with certain reducing agents upon sundry persalts, and the applications which I have made of them in the production of photographic impressions in gallate of iron, in carbon, and other inert or neutral colouring matters.

Alloxantin and Bichromate of Potash.—In 1858 I was in a chemical factory where they were treating uric acid with the object of converting it into alloxan, alloxantin, and, finally, murexide. I wished to try the action of light upon the alkaline bichromates mixed with these substances, knowing beforehand that alloxantin had a great affinity for oxygen. This last substance was the only one which gave me a result applicable to photography.

I ascertained then that the mixture, in equal volumes of concentrated solutions of alloxantin and bichromate of potash, applied to paper, was very sensitive to light, and that the reduction of the chromic acid is more complete than when using the bichromate alone. I tried the same mixture with gum upon stone, but without obtaining any useful result. With reference to the oxidised alloxantin, it did not produce any photographic compound; I sought, therefore, to withdraw a portion of the unreduced chromic acid in those places where the action of the light had been well marked, and I conceived the two following methods of operating:—

1. If a paper treated with bichromate of potash and alloxantin be exposed under a positive, chromate of silver is formed in the parts not acted on by light, but in a manner much sharper and cleaner than if the bichromate be employed alone. A beautiful positive image of a red colour may also be obtained in this way, fixable for *a short time only*, by a simple washing in water; for the chromate of silver undergoes a spontaneous change after a few days, even in the dark. In order to render the image thus obtained quite permanent, I immerse it in a diluted solution of iodide of potassium, by the action of which iodide of silver and chromate of potash are formed. The paper is then washed with distilled water, and the iodide of silver, which forms the design, is rendered sensitive by plunging the sheet in a very dilute solution of nitrate of silver. It is then washed in several waters, and exposed for a few seconds to light. I then treat it with a solution of gallic acid, which gives me a very beautiful black proof. It is then washed once with water containing chloride of sodium, and finally fixed with hyposulphite of soda, washed, and dried.

2. An impression, obtained as above, is treated with a mixture of gallic acid and protosulphate of iron, or, better, of protochloride of iron, prepared just before using, by mixing solutions of sulphate of iron and chloride of barium in equivalent proportions. In this way a very beautiful image is soon formed, composed of gallate of iron, in those parts where the bichromate has not become decomposed. A few changes of common water are sufficient to fix a picture obtained in this way.* If the operation be conducted upon a glass, covered with a mixture of thirty grains of gelatine dissolved in eleven ounces of water, to which has been added two ounces of a mixture of equal volumes of alloxantin and bichromate of potash, a proof is obtained possessing a remarkable degree of sharpness.

This process, apart from the use of alloxantin, has many points of resemblance to the ink process proposed by different persons. It differs from these, however, in the fact of my using but one developing bath: the permanency of the picture is by these means increased.

Alloxantin and Bichloride of Mercury.—Solution of alloxantin does not precipitate bichloride of mercury in the dark, but, in direct sunlight, a deposit of protochloride of mercury takes place, accompanied by a disengagement of gas.

Paper prepared with this mixture, and exposed to the light under a negative, blackens in the parts acted on when plunged in a dilute solution of ammonia or hyposulphite of soda.

Alloxantin exalts the sensibility to light of ferrocyanide and ferricyanide of potassium, which, applied alone to paper, are reduced but very slowly.

In this case the perchloride of iron is reduced to the state of protochloride—a substance upon which the ferrocyanide of potassium does not act, while the ferricyanide produces with it the characteristic colour of Prussian blue. Tannin and gallic acid blacken only those parts where the perchloride has not been decomposed. Alloxantin bleaches the tannate and gallate of iron produced, yielding an insoluble compound, which becomes blue on the addition of ferrocyanide of potassium.

Alloxantin and ferrocyanide of potassium yield to paper a film which becomes green under the influence of light. Acids restore this green colour to a bright blue. Solution of sulphate of copper gives a red colour only in those parts which have not been reduced by light.

Alloxantin and ferricyanide of potassium gives a film which, after partial exposure to light, becomes blue on the addition of perchloride of iron in the parts subjected to the actinic influence; and this would seem to prove that the light has reduced the ferricyanide to the state of ferrocyanide.

Taking this fact as a foundation, I prepared an excellent positive paper, by applying at first a coating of solution of perchloride of iron and alloxantin, allowing the paper to dry in the dark, and afterwards immersing it in a solution of ferricyanide of potassium and alloxantin. This paper is very sensitive to light. It becomes blue at first, the ferricyanide forming Prussian blue with the protochloride produced by the reducing action of light; but a solution of ferricyanide produces a very beautiful blue on the exposed portions of the picture. Washing in ordinary water suffices to fix these blue proofs, which may be afterwards readily transformed into ink pictures by immersion in a solution of gallic acid containing an excess of ammonia.

Alloxantin in solution precipitates nitrate of silver. Paper covered with a solution of alloxantin, dried and immersed in a solution of nitrate of silver, is very sensitive to light: it may be advantageously employed for the production of proofs which are intended to be immediately developed with a gallic acid.

* *These proportions are altered, upon the assumption that the word centigramme is substituted for centilitre in the "Moniteur,"* as it would be impossible to dissolve thirty grains of gelatine in five grains of water, as ordered therein.

STEREOGRAPHS.

Instantaneous Views of London, &c. Photographed by VALENTINE BLANCHARD.

London: C. E. ELLIOTT, Aldermanbury Postern.

IN our retrospective summary of the past year's occurrences in the photographic world, we could not forbear remarking upon the very noticeable advance that had been made in the production of instantaneous views. Until lately pictures of this class were rather exceptional: now we find them not only frequent, but published in series of considerable extent, and not confined to the work of one or two but of several skilful operators. Besides Mr. George Wilson, who is a veteran instantaneous photographer, and indeed the originator of a particular class of works of this nature, we have had recently to welcome the *debût* of several newer hands in this branch of the art. It now becomes our duty to introduce another to the notice of our readers in Mr. Blanchard, whose works are before us, some of them being remarkably Wilsonian in aspect: this is peculiarly the case with Nos. 51, 52, 66, and 87, which are fine studies of clouds and water—and something more than that, for they are charming compositions.

In No. 51, THE THAMES AT BLACKWALL, LOOKING TOWARDS GREENWICH, exhibits the Greenwich "reach" of the river just after high water, when the said river looks its best, and by association of ideas reminding one of whitebait enjoyed with a few genial companions. A fresh breeze is blowing; witness the direction of several flags, the dancing wavelets of the stream—touched here and there with what a sailor would call "cats'-paws"—and the light clouds scudding across the sky. The centre of the picture is occupied by a barque afloat, "stern on" to the spectator, sails triced up, and rigging all "taut:" she is riding at anchor, and is destitute of cargo—as shown by the way in which she stands out of the water—and has most likely just been taking in ballast from the "lighter" alongside. On the left is a barge, fully-laden, drifting down with the tide; and in the background many low warehouses and workshops on the shore at Millwall, with the tall masts of numerous other vessels in the further bend of the river.

No. 52 is a view taken from the same spot as the preceding, but looking down the WOOLWICH REACH OF THE RIVER THAMES. A sea-going steamer is in full retreat in the centre, with a thin wreath of black smoke coming out of her funnel, and leaving a narrow "wake" of white foam behind her; the water is agitated by the swell from the steamer, two huge mooring buoys being tossed hither and thither; several colliers are seen at anchor in the distance, with a vessel or two in full sail; the Surrey hills about Charlton and Woolwich form the background; and the whole is well finished by a summer sky, studded with some fleecy clouds.

Perhaps the most eminently characteristic slide taken from the pier at BLACKWALL is No. 87—HIGH WATER—which displays all the bustle of that exciting time at the spot indicated, when dock-masters are driven half crazy, and everybody is in a hurry. Some ships are making the best of their way inwards and others outwards; collisions are imminent; and steamers are threading their devious way in and out amongst the craft of all sizes and vessels of more commanding presence, like Hansom cabs in a crowded thoroughfare. The very sky, too, is in perfect keeping with the scene: the wind appears to be dead ahead—the clouds scattered right and left in every direction—vessels on every possible "tack," most having only a few sails set, for the breeze is evidently "stiff." Just in front is a river steamer in retreat full of passengers: yonder is another coming fast towards us: all is activity and motion. It will be quite exciting to those whose lives are passed much in seclusion.

In No. 87—SUNSET AT GREENHITHE—we have a marked contrast to the preceding. The camera has been pointed directly towards "the light that rules the day," which, partially shrouded by a bank of cloud, sinks slowly towards the horizon. It is low tide: the water of the river is scant and sluggish, and a large mass of the black slimy ooze on the banks is exposed to view—not smooth, but scored and twisted by the sharp keels of many retreating vessels and chafing hawsers. From the surfaces of the mud and water the sunlight is reflected in a long, irregular strip. A collier brig, aground, is seen on the left, and another, but half afloat, further down; and a couple of skiffs are being rowed close to the edge of the water, creeping slowly against the stream. There is a warmth and glow about this, with an air of repose, that is highly meritorious; albeit there are two or three trifling blemishes—very trifling—in the negative.

No. 82—SUNSET AT GREENHITHE—is another study taken from precisely the same spot as the last-mentioned; but the sun has sunk lower down in the horizon, and is now shrouded and hidden entirely from view by a bank of dark clouds with torn and rugged edges, charmingly lit up with his last rays. There is a lurid glare from the mud and water, proceeding from the twice-reflected light—no longer in an irregular strip, but diffused widely over the surface. As an art-production this is very fine, and, with No. 87 as a commentary upon it, must be invaluable to a thoughtful art-student in demonstrating the ever-varying effect of light and shade.

Nos. 67 and 83 are different views of the celebrated "WARRIOR," IRON-PLATED WAR FRIGATE.

No. 107 is a capitally-executed photograph of a lively scene—a large ship entering the East India Docks, with the PASSENGERS LANDING AT BLACKWALL PIER from a couple of Woolwich steamboats.

No. 98—STUDY OF CLOUDS AT SOUTHSEA—is very fine, so far as the clouds are concerned, and the barque in full sail is admirably delineated; but the whole is, as a composition, far too prim and formal.

Some sunset effects at Ryde are so "under-exposed" that there is far too much "room for the imagination" left to suit the popular taste at least.

There are numerous instantaneous street views in the metropolis; but, as a transition one from the preceding class, we may first notice No. 125, THE HOUSES OF PARLIAMENT, *from Lambeth*. This slide is more satisfactory out of, than in, the stereoscope. A "wherry," with four rowers and a steersman, are seen crossing in front of the "New Palace:" Westminster Abbey also is visible on the left. But there is an absence of sharpness about some parts of this subject, where its presence is a desideratum, that is somewhat disappointing: there is also a little evidence of marginal distortion that is not pleasing. Still there are points about this slide that will, no doubt, render it a favourite.

Of the street views in London we must candidly admit that they are not equal to some of Paris that we recently criticised in these pages; but it must not be forgotten that the atmosphere of London interposes difficulties from which the exponent of scenes in the French metropolis is altogether emancipated. It would not, therefore, be fair to judge them both by the same standard. There are, however, some other faults about these that are not due to the inferiority (in a photographic sense) of the atmosphere, and at the existence of which we are a little surprised. We allude especially to some of the points of view selected; for, if a proportion of them were owing to the choice being what is popularly known as "Hobson's," others of them were certainly not in that category. However, we are glad to find a photographer who has the courage to attempt so difficult a task as that of the delineation of scenes in London streets.

Of all before us we prefer that of THE ROYAL EXCHANGE (No. 85), which gives a view not only of the Exchange, but of the whole vistas down Cornhill and Threadneedle Street, with the immense number of passengers both on foot and on vehicles of all descriptions which are constantly to be found in these thoroughfares. Photographically the slide is excellent; but artistically it is somewhat deficient. The sun is shining, and is located directly behind the spectator, and the two thoroughfares already named, branching right and left, too completely balance one another, while a line dropped from the "grasshopper" vane of the tower would pass through the apex of the gable over the entablature, and bisect the Wellington statue to a hair's breadth. We have frequently cast an eye on the very spot, to determine which would be the best point of view for this subject; and we have long since arrived at the conclusion that it would not be found at the first floor window of the Insurance Office, at the corner of Charlotte Row, where we have no doubt this view was taken, but by the Mansion House, at the corner of the west balustrade, which would enable us to include the front of the Bank of England, or the greater portion thereof: the time of day for the exposure should be from two o'clock to half-past two in the afternoon. We may, perhaps, be open to the charge of hypercriticism on the slide before us, for it is in all other respects than those indicated very excellent.

No. 114—HUNGERFORD SUSPENSION BRIDGE—is admirable and unexceptionable on either photographic or artistic grounds.

One without title or number we recognise as LONDON BRIDGE FROM NEAR THE STATUE, KING WILLIAM STREET, with its stream of vehicles, though pretty numerous, wonderfully clear for that usually thronged locality. We regret that this has been taken from the top of a house, as the parapet much interferes with the effect of the view.

There are many other familiar scenes, as Charing Cross—The ost Office—The Quadrant, Regent Street—Palace Yard—ockspur Street—Ludgate Hill, &c. But, ere concluding, we ould say a word about the latter, which includes St. Paul's athedral from a very unfavourable point of view; and, as we are equainted with two *good* ones, we may as well offer the suggestion r future advantage. With a lens of moderately short focus, we elieve it would be possible to include a general view of the athedral from the first floor window of a warehouse at the commencement of Cannon Street, either at Messrs. Behrens and lumberg's, or at the next more westerly one. The second very avourable spot from which to obtain a good view is fortuately a comparatively quiet one: we mean the Southwark end of outhwark Bridge.

We have pointed out some few faults, it is true, in the street iews; but we must in justice add that they are, on the whole, eritorious, and give an excellent idea of life in the great etropolis.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

Sentiment—Introductory Considerations—Is the Highest Art True or False to Nature?—Sir Joshua Reynolds's Art-Creed and his Photographic Disciples—Hazlitt and Ruskin *versus* Reynolds—Witnesses Examined on Either Side, and their Evidence given in a Series of brief Extracts from "Modern Painters," the "Athenæum," "Blackwood's Magazine," the "Guardian," &c.

"There is nothing in nature, however mean or trivial, that has not its beauty, and some interest belonging to it, *if truly represented.*"—*Hazlitt.*

"Seek not for that which is easiest to imitate, but for that which is most important to tell. * * * Conveying the impressions of nature into the mind of the spectator, and chiefly forcing upon his feelings those delicate and refined truths of specific form, which are just what the careless eye can least detect or enjoy, because they are intended by the Deity to be the constant objects of our investigation, that they may be the constant sources of our pleasure."—*Ruskin.*

"Most of my visitors, fox or goose,
When they hear me speak of a picture's *use*,
In bark or cackle their mirth let loose."—*Robert Brough.*

"We mistake men's diseases when we think there needeth nothing to cure them of their errors but the evidence of truth. Alas! there are many distempers of mind to be removed before they receive that evidence."—*Richard Baxter.*

My Dear Fellow-Student,

Tone is so intimately allied to the expression of sentiment that the consideration of the latter may now, I think, very harmoniously succeed that of the former. But, before we turn to its study, there are sundry questions of importance to be carefully considered.

Sir Joshua Reynolds, in his thirteenth discourse, says:—"If we suppose a view of nature represented with all the truth of the *camera obscura*, and the same scene represented by a great artist, how little and mean will the one appear in comparison with the other where no superiority is supposed from the choice of the subject! The scene shall be the same, the difference only will be in the manner in which it is presented to the eye." Such belief as this was in harmonious accordance with Sir Joshua's particular art-creed; but, in the remarks to which the above quotation is introductory, we find this wonderful supposed difference between the camera picture and the great artist's work exists solely in the power which the latter has of exciting the imagination, and embodying such circumstances as "contribute to the general character of the work, whether it be of the elegant or of the more sublime kind." Sir Joshua's creed actually seems to infer that Nature has no innate elegance or sublimity, although she may express comedy or farce of the lower kind well enough. To use this great painter's own words—"The lower kind of comedy, or farce, like the inferior style of painting, the more naturally it is represented the better; but the higher appears to me to aim no more at imitation than Raffaelle in his cartoons, or Poussin in his sacraments, expected it to be believed that what they exhibited were real figures." In this quotation we find that belief which, preserved in certain minds, now so obstinately denies to photography the position of a fine art. Mr. Sutton follows this false prophet when he speaks of the truths of photography as inferior to the falsehoods of art. Sir William Newton bows down before this presumptuous and irreverent creed when he denies that photography can ever be a fine art; and that poor-souled "mechanic," Silvy, the photographer, assuming all the airs of an aristocratic artist in the costly accessories of his stately studio, believes in this when he claims for his own works, which so frequently evidence the studious care and skill of an artist in their posing, lighting, and composition, no position but that accorded to purely mechanical productions. This creed wields the pens which have been so busy against our art in the journals and daily papers of our day. This was the creed of a recent writer in the pages of the *London Review;* and to a rooted conviction in the truth of this creed is due the apathy and indolence with which so many good photographers give to their hands alone an art which seeks its real power and highest value only from their heads. Now, therefore, let us pause before going further, and examine this creed—put it on its trial, and see what it is made of, building our hopes upon its falsity, and our degradation upon its truth, but yet examining it without prejudice and without injustice.

A well known and highly reputed writer on the fine arts, William Hazlitt, says:—"The great works of art at present extant, and which may be regarded as models of perfection in their several kinds, are—the Greek statues, the pictures of the celebrated Italian masters, those of the Dutch and Flemish schools; to which we may add the comic productions of our own countryman, Hogarth. These all stand unrivalled in the history of art; and they owe their pre-eminence and perfection to one and the same principle—*the immediate imitation of nature.* This principle predominated equally in the classical forms of the antique and in the grotesque figures of Hogarth. The perfection of art in each arose from the truth and identity of the imitation with the reality. The difference was in the subjects: there was none in the modes of imitation. Yet the advocates for the *ideal system of art* would persuade their disciples that the difference between Hogarth and the antique does not consist in the different forms of nature which they imitated, but in this—that the one is like, and the other unlike, nature. This is an error the most detrimental, perhaps, of all others, both to the theory and practice of art." Here is *one* witness, then, against the creed of Sir Joshua; and here's "another more potent than the first:"—

Ruskin, speaking of certain common and well demonstrated evils in art, says:—"The cause lies in the painter's taking upon himself to modify God's work at his pleasure; casting the shadow of himself on all he sees; constituting himself arbiter where it is honour to be a disciple; and exhibiting his ingenuity by the attainment of combinations whose highest praise is that they are impossible." And he concludes that "Every alteration of the features of nature has its origin either in powerless indolence or blind audacity—in the folly which forgets or the insolence which desecrates works which it is the pride of angels to know and their privilege to love."

On the other hand, followers of Sir Joshua reply—"If people want to see *Nature*, let them go and look at herself," and ask, "Why should they see her at second-hand on a piece of canvas?"* Or assert, in the words of another false teacher, writing in *Blackwood's Magazine*—"It is not what things in all respects really are, but how they are convertible by the mind into what they are *not* that we have to consider." Just, as they might add, in the words of the Chinese Emperor, denouncing the European's perspective drawing, "Wretched barbarian! I demanded of you a *picture* of my city's new street, and behold you produce me the street itself!"

In that fine old magazine, the *Guardian*, we have another witness for *our* side, who says:—"Those who are most capable of art are always most fond of nature, as such are chiefly sensible that *all art consists in the imitation and study of nature.* On the contrary, people of the common level of understanding are principally delighted with the little niceties and fantastical operations of art, *and constantly think that finest which is least natural.* A citizen is no sooner proprietor of a couple of yews but he entertains thoughts of erecting them into giants, like those of Guildhall." Going a little further back into the past let us bring forth another witness, Dryden, who says of painting and poetry:—"To imitate nature well, in whatever subject, is the perfection of both arts; and that picture and that poem which comes nearest the resemblance of nature is the best. * * Our depraved appetites and ignorance of the arts mislead our judgments, and cause us to take that for true imitation of nature which has no resemblance of nature in it." The evidence of a great poet is worth the having. Dryden, I thank you!—you may stand down! The next occupant of our imaginary witness-

* Art-critic in the *Athenæum.*

box is burly old Dr. Johnson—not a great lover of art, it is true, but a great thinker, mark you, for all that; and the doctor says at once, with an air of—there, I've settled it for you—"Nothing can please many and please long but just representations of general nature." Gœthe, the great German writer, takes this witness's place, and he asserts—"If an artist turns to natural objects, uses all care and fidelity in the most perfect imitation of their forms and colours, never knowingly departs from nature, begins and ends in her presence every picture that he undertakes—such an artist must possess high merit, for he cannot fail in attaining the greatest accuracy, and his works must be full of certainty, variety, and strength." A master from the Cork School of Design—Edward Sheil—next comes humbly forward, and he says—"Nature's glorious forms, could they be copied literally, are far too perfect and lovely in themselves to be used as secondary things to any work of man." We next summon Carlyle, who appears, exclaiming, impatiently—"May the Devil fly away with the fine arts!" for, says he, truly enough, "The fact is, though men are not in the least aware of it, the fine arts, divorced entirely from truth this long while and wedded almost professedly to falsehood, fiction, and such like, are got into what we must call an insane condition: they walk abroad without keepers, nobody suspecting their sad state, and do fantastic tricks equal to any in Bedlam—especially when admitted to work 'regardless of expense,' as we sometimes see them! If that be '*ideal beauty*' to say merely, 'Good Christians, you observe well I am regardless of expense, and also of veracity, in every form,' too truly these poor fine arts have fallen mad!" and so he shrugs his shoulders and steps down. There are plenty more witnesses on my poor bookshelves; but we will only hear one other—Mr. Burnell, the architect—whose words are more cheering than those of the last witness; for he says, hopefully and gladly—"The main characteristic of the artistic movement of our day is towards truth: it may be awkwardly, and with somewhat of fear and trembling—with many 'longing, lingering looks behind' to the idols our fathers were wont to worship; but still, on the whole, our artists are striving as earnestly as may be to be themselves, rather than unreasoning copyists and repeaters of the productions of other times."

And so, for the present, we close the case. Now, what think you? Do you not think photography can as faithfully render the truths of nature as painting can? And if so, surely you must think with Ruskin, and Hazlitt, and Gœthe, and Johnson, and Dryden, and the other such witnesses, that "the picture which is looked to for the interpretation of nature is invaluable, but the picture which is taken as a substitute for nature had better be burned."*

To return to Sir Joshua's words as quoted at the commencement of this epistle. It is undoubtedly true that two pictures might be produced of one scene, with no difference save that which was derived from the intellectual acquirements of the artist in the one case, as opposed to the simple mechanical power of some piece of scientific apparatus in the other; and that the latter would be strikingly "little and mean" when compared with the former. This we see illustrated daily in the artistic and non-artistic productions of our brother photographers. It is moreover true—as Sir Joshua also asserts—that this superiority is greatest in the power the artistic picture has "of exciting the imagination," and embodying such circumstances as "contribute to the general character of the work, whether it be of the elegant or of the more sublime kind;" *but it is not true—as my witnesses have said—that we can only excite* the imagination or realise the elegant and sublime by depicting impossibilities and creating things which are purely imaginary.

Here, however, I must conclude; but in my next—there being no two opinions on this subject in God's three great volumes of earth, air, and sea—let us turn to Nature, sure that we shall discover in her pages, for every feeling and sentiment of the heart, and for every aspiration and craving of the soul, an awakening voice and strengthening influence.

Yours, faithfully,

ALFRED H. WALL.

* *Modern Painters.*

THE CHARGE OF THEFT AT MR. DANCER'S WORKSHOP.—Edward Donovan, charged with stealing tools and materials, the property of Mr. J. B. Dancer, optician, Manchester (to which case attention was drawn in our last number), was brought up for trial at the Manchester City Sessions on the 9th ult. The prisoner was found guilty, and was sentenced by the Recorder to four months' imprisonment

Notes of the Month.

THE somewhat startling announcement in the current number of the *Journal of the Photographic Society*, that exhibitors in the photographic department of the International Exhibition would not obtain more than about one-eighth of the space for which each had applied, and that the whole photographic space to be divided was little more in magnitude than that of the Rooms in Pall Mall, where the annual Exhibitions are usually held, has taken many by surprise. That claims would necessarily have to be cut down, perhaps a great deal—that inequalities in the claims must be adjusted, and some degree of patience and self-denial exercised—were things which all naturally expected; but that such a large proportion as seven-eighths of each claim, and therefore seven-eighths of the whole proposed display, would be swept away, was a contingency undreamt of in their philosophy. After all the formal diplomacy that has characterised our "little difficulty," if such a small cell in the Great Beehive is to be ours, it has certainly—but for the principle involved—rendered itself amenable to classification amongst those things which give birth to such pungent similes as that of "brewing a storm in a tea-pot." Some unknown Solomon suggests amalgamating some of the allotments, and casting lots for them. We ourselves suggest the adoption of the principle embodied in the new revolving shop-front: revolving picture-frames might perhaps meet the dire necessities of the case. We commend the idea to Mr. Fox, of Little Britain.

What a pity it is this was not made known earlier. There could then have been no reasons why the usual annual Exhibition should not have been held. If 400 exhibitors are to display their works—or rather a selection from them—in so small a department, the usual winter Exhibition could have been held without detriment to that in May, as if each exhibitor had reserved a few of their pictures they would still have had as many as they are likely to get space for. The pictures at the annual Exhibitions are usually the new ones: those for the International Exhibition need not necessarily be new ones, but rather the *best* ones that each photographer, whether amateur or professional, possesses, irrespective of date. It should be borne in mind that the masses who will critically inspect or ignorantly stare at the photographs displayed in May are just those who never find their way to the annual Exhibitions. Moreover, the winter Exhibitions are a source of sale and other advantages to the professional photographer which this season will be quite lost, without any apparent compensatory advantages. Thus many of the pictures will have to stand over altogether to the following year.

The sale of *cartes de visite* of the late Prince Consort has been almost incredible. Good copies have realised greatly advanced prices. Negatives of his late Royal Highness are now held to be priceless in value by those who fortunately possess any.

Mr. C. Thurston Thompson has just produced a series of negatives, about one hundred in number, from the choicest examples of Cinque Cento, and other periods of early Italian art, now in the South Kensington Museum, and which were purchased from the Campagna Collection.

In connexion with photography in the open air, M. Lorens, a photographer of St. Petersburg, has brought before the Academy a photographic apparatus constructed by himself. By a special and very ingenious arrangement the inventor has so contrived that the plate of glass, once covered with iodised collodion, does not leave the camera until the image has been produced upon its surface. The plate is then introduced, by a special mechanical contrivance, into a kind of trough, composed of two coloured glasses,* and there undergoes the operations necessary to the development of the image. This apparatus, therefore, offers the double advantage—1st, of preserving the prepared plate in a higher degree of sensibility than the ordinary process; and, 2nd, of permitting the photographer to leave his darkened room, and thus facilitate the work required to be done out of it. M. Lorens, after having shown and explained in detail the nature of his apparatus, made use of the same by taking a view of the left bank of the Neva, and thus afforded to the members of the class an opportunity of becoming satisfied of the accuracy of all the operations accomplished by means of this very simple and ingenious arrangement. The Academicans congratulated M. Lorens on his happy invention, which, by simplifying photographic operations, will not fail to increase the useful applications of the art of photography.

S. T.

* "Espece d'augé composée de deux verres de couleur."

Scraps and Fragments.

DOOMSDAY BOOK.—It is proposed to apply Col. Sir H. James's photozincographic process to the production of fac-similes of that portion of *Doomsday Book* which relates to Hertfordshire—in a similar manner to the series relating to the County of Cornwall, previously produced—if fifty copies, at ten shillings each, be subscribed for.

AMATEUR PHOTOGRAPHIC ASSOCIATION.—Prosperity sometimes is a source of embarrassment. The number of negatives that have been sent in by the members of the Amateur Photographic Association—upwards of thirteen hundred—is so great that during the winter months it is a task of some difficulty to print a fair proof from each one, in order that the judges may be able to award the prizes, the former being a task which must obviously be accomplished first.

PHOTOGRAPHY APPLIED TO ETHNOLOGICAL SCIENCE.—From the *Bulletin de l'Academie des Sciences de Saint Petersbourg*, we learn that M. Von Baer has presented to the Academy of Saint Petersburg some photographs, taken under the direction of M. Sévertsof, representing Kirghis and Tartars inhabiting the steppes of the Ural. He has, furthermore, called the attention of his colleagues to the methods pursued by him in these productions, and which give them a real utility as ethnological studies. Each figure is produced in profile, and in a front view, with the head uncovered, and the hair shaven off, so that the measurements of the three principal dimensions of the cranium can be taken without difficulty. As it is much easier to take photographic portraits of a large number of living individuals than to collect the same number of authentic crania, it follows that photographs of this kind will furnish an excellent method of determining the mean proportions of the skull in different races of men, and of the limits of variation in any given type. M. Von Baer thinks this method should be recommended to the attention of naturalists in their travels, as being of real utility.

PHOTOGRAPHIC DIORAMA.—We *(North British Daily Mail)* were recently shown the result of a discovery made by Dr. Taylor, of the Andersonian University, by which most perfect aërial effects were produced on photographic landscapes. The apparatus is simply a box fitted with lenses and other appliances. The pictures we saw operated upon were mostly landscapes taken in the East Indies by Mr. Andrew Williamson, of the firm of Williamson Brothers and Co., Calcutta, the scenes themselves being selected with great skill and taste; also, a few magnificent Highland views, photographed by the Doctor himself in the noble demesne of the Duke of Argyle, at Inverary. The plates are of a large size, and are taken on glass, to which it would seem that this invention is best adapted. The object is to produce the various atmospheric effects which are constantly occurring in the natural landscape, such as the passing of clouds, sunset, sunrise, moonlight, &c.; and the success is as wonderful as the effects are pleasing. For example, we are looking through the glass at an Indian river scene. The glow of a tropical sun is gleaming in the sky and in the waters; the foliage and verdure on the river banks dazzle the eye with the brilliantly-reflected light. But as you look a change creeps over the atmosphere: the clouds which seemed to hang in the sultry sky apparently move and assume a dusky hue, the waters look sombre and the landscape begins to wear a deeper green, and gradually the light dies away and leaves you to enjoy the cool and quiet of an evening on the banks of the Ganges or the Hooghley. The operator has merely again to say *presto!* and slowly the clouds begin to be lighted up, the sun sends up his red and gold from below the horizon, and as you gaze you have once more a noon-day splendour shining over all. Some very fine Hindoo groups were also operated upon with the most pleasing effect; but perhaps that which struck our admiration most were some avenue scenes from Inverary. The invention under notice, of course, requires an apparatus and considerable space to work it, and thus rather takes the place of an exhibition than of a common picture. All that we need say of the *modus operandi* is that it is extremely simple, and consists of a revolving cylinder, the edge or rim of which is strongly coloured with those hues that are required to produce the dioramic effects. A number of gas jets are so placed as strongly to illuminate the cylinder and reflect its hues upon the photographic plates. The effects produced are really surprising. With such photographic plates and such an apparatus, a person may never leave his own chamber, and yet in reality become acquainted with the peculiarities and beauties of foreign climes, in all their varying hues and shades. We should add that while the merit of this discovery or invention is due to Dr. Taylor, he has been ably assisted in bringing it to its present state of perfection by Mr. Macnab, the well-known photographer.

Entremets.

IN SEARCH OF AN OPERATOR.

(Concluded from page 31.)

THE next applicant was a tall, gentlemanly foreigner, who entered my room with a bow such as no Englishman—not even a dancing master—could achieve, and gracefully presented a short note of introduction from one of my personal friends. As I glanced at the glossy broadcloth and spotless linen of this resplendent personage, and caught the rich glow of his massive gold chain and the brilliant glitter of his diamond studs, I thought it wise to come at once to the consideration of terms. With an amiable smile and elegant inclination of his head he expressed his perfect willingness to serve me for such remuneration as I would proffer, and seemed pleased to hear the sum I named—which pleasure, I must confess, was more than I expected. Continuing the conversation, I found—as indeed my friend's note had stated—that Mons. E—— was a man of education, well versed in the *rationale* of the art he professed. Not only was he acquainted with the optical and chemical sciences in their applications to photography, but—a most unusual thing among English operators—he had positively a good knowledge of the laws which govern pictorial effect. When he departed I was conscious of an indefinite sense of humiliation, and tried hard to do something more than jerk my head in response to the graceful ease with which he raised his curly-brimmed hat and bowed himself smilingly from my presence. I made up my mind at once to give this operator a trial.

Succeeding Mons. E—— came a little individual, who, either through some strange freak or accident of nature, seemed to have in his single person the oddly-combined head of a giant and body of a diminutive boy. He had such a habit of rolling this huge head, first to one side and then to the other, that I quite thought it would every moment destroy his balance, and bring him to the ground. He had heard I wanted "a hoperator." I inquired in what branch of the art he had been employed. Well, he *had* been "a doin' the printin'," but "nothin' came amiss to *him;*" and if I wanted to know "wot a good negative or slap-up positive" was, he was my man. Moreover, he could put me up to "a thing or two" which he believed everybody was not "fly" to. As to "the speclimens" he "seed" in my room down stairs—"*there!*" if he "couldn't lick them—*oh!*—that's all!" "and, if yer like, I'll tell yer wot," continued this eccentric applicant, with such a roll of his tremendous head that I instinctively half put out my hands to save him, "I seed one ir your rooms wot doesn't seem to be used over-much. Now, you jest ingage me, and make that ere room into a slap-up air-cuttin' saloon; cos, don't yer see? why, that ere's the bisiness what I was 'prenticed to—there for yer!" * * Those who are not familiar with the various descriptions of operators may think this hasty sketch exaggerated and overcharged; but members of the profession will recognise the individual described as representative of a class by no means rare.

Treading on the heels of the mysterious combination of the giant and the dwarf came one not less peculiar, in the form of an American operator, from the *U*nited States. Of course he "guessed" I was in want of an operator, and of course he addressed me as "Mister." He sauntered leisurely into the room with his hands in his pockets, deliberately leant his back against the chimney-piece, and removed a plug of tobacco from his sallow cheek, before he spoke. Had he been in the profession long? "Wall, he rayther guessed" he had. Wasn't he one of the first to "set a Daguerreian and photographic gallery a-goin' in New York? and wasn't New York, as was wall known, the first city in the world to go a-head in the art?" Making a few inquiries, I chanced incidentally to ask what kind of developer he preferred for his negatives, when he slowly drew his hand from his pocket, winked with a cunning leer, and laid his finger along one side of his nose, saying, "jest you give me an engagement, mister, and then you'll see. I guess I aint a going to stick up open in my winder what I sells in a book over the counter." * * I saw a number of operators after this specimen of the transatlantic article, but at length decided upon engaging the foreigner. Mons. E—— had been with me about three or four days, and I was congratulating myself upon having secured a very able assistant, when one of the young ladies employed in "touching out spots" left in the evening, as I was informed, in tears, and was not in her usual post the following morning. A visit from this young lady's brother on the succeeding day made me acquainted with the cause of her absence; and, sending for Mons. E——, I bluntly informed that elaborately got up young man that here in England we held no evidence so conclusive

in demonstrating the gentleman as that respect with which a well-bred man treats a respectable woman, and handing him his salary informed him that his services would be dispensed with from that hour. With an excellent show of virtuous indignation he proudly declined receiving a larger sum than was due for the few days he had been employed, and, gravely bestowing upon me even a more elegant and graceful bow than he had ever before indulged in, went his way.

So I again inserted my advertisement—again received a batch of letters and a throng of applicants, from which I selected Mr. T———.

Mr. T——— was a constant reader of *all* the photographic journals, and letter-writer in more than one. He had tested the value of every suggestion they contained: he knew all the writers in their pages, and all the various modification of modifications of modifications of original processes. He could give me chapter and page for the origin of every remark I made, and could tell me by whom my opinions were supported and by whom they were denounced—whether in this journal or in that, at this society or at the other; *but*, Mr. T——— could not, with all his surface knowledge and specious talk, take a negative that would produce a good print. In his numerous and varied experiments—*a single trial* sufficing to test each process or modification of a process—he loaded the dark room shelves with dirty plates and bottles of various collodions, developers, and intensifiers—spoiled baths, wasted chemicals, but was never the better for his misapplied labour. Now he had just got the right thing—detail, half-tone, transparent shadows, opaque high lights—*only* he could *not* keep the film on the plate. Now he just wanted a little more intensity, and went to some entirely new source for it; and now he needed nothing but a little brilliancy, which was to be found in an entire change of the system of development. In short, Mr. T——— was one of those operators whose failures may be traced solely to one cause, viz., *a want of perseverance*, without which, however great and varied the knowledge, success can never be achieved. In vain I tried to tie him down to some one method of procedure, and convince him that success was within its scope. He gave it one trial, failed, and turned to something new. So Mr. T. followed Mons. E.

Then I got a careless operator, who damaged my lenses, tumbled over and broke my landscape camera—never having used one before—put his foot through focussing glasses, got dark slides out of order, spoiled baths, and contrived to annoy and teaze me until I sometimes grew half frantic, and only felt easy and safe when he turned his horrible back upon my place.

Then I got an operator who laughed to scorn every pictured face that was not flat, with over-intensity in the negative—one who never could be taught, and who, mysteriously enough, would persist in calling an image well modelled, and brought out with gradation and half-tint, "*flat*," and one made up of white paper and black patches, "*round*." At length I tumbled over a sensible and earnest amateur, willing to be taught and anxious to learn, and made of such materials an operator for myself, so weary grew this my difficult and prolonged search for the ready-made article.

In concluding this slight outline of some recent experience, it must not be thought that I ignore the existence of many and excellent professional operators; only, as I have before said, they are in demand, and that demand is increasing, as you may easily know if you will undertake to realise the fact by being—*in search of an operator.*

R. A. S.

Meetings of Societies.

MEETINGS IN FEBRUARY.

4th.—London and Liverpool.
5th.—Manchester, Edinburgh, and Bradford.
6th.—Glasgow.
7th.—Newcastle.
11th.—Photographic Society of Scotland and Birmingham.
13th.—South London and Chorlton.
19th.—North London and Edinburgh.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary general meeting of this Society took place at Myddleton Hall, Islington, on Wednesday the 22nd ult.,—Mr. C. Jabez Hughes occupying the chair.

In opening the proceedings the Chairman expressed his regret at the absence of the Vice-President of the Society, who usually occupied the chair. He was also sorry to be obliged to announce the absence of the Secretary on that occasion: in his absence the Society would avail itself of the services of Mr. Shave, who had kindly volunteered to read the minutes of the last meeting.

The minutes of the last meeting were read and confirmed.

As there was no paper appointed to be read to the meeting, the Chairman would direct attention to one or two objects which had been contributed for inspection of the members.

The first was an instantaneous shutter, by Messrs. Horne and Thornthwaite, which consisted of a piece of mahogany a quarter inch thick, and of the proportion of eight inches by three inches, furnished with a circular hole to which is attached a brass ring, fitting on the hood of the lens, and intended to be used in the place usually occupied by the cap. The edges of this mahogany are grooved, to admit of the sliding up and down of a piece of brass of the same size as itself, and also furnished with a circular hole of the same diameter as the lens to be used. At the moment of exposure the piece of brass is raised so as completely to cover the lens, and by releasing a catch the brass falls by its own weight, opening and closing the lens by a continuous motion.

The other objects were a nitrate of silver bath and dipper and a tray made of ebonite, manufactured by Messrs. Silver and Co. In reference to these Mr. Moens remarked that in a discussion which he had with Mr. Silver, that gentleman assured him (Mr. Moens) that these vessels were quite free from the character of brittleness which had been too readily imputed to them, and he suggested that those possessing that character which had got into the market were probably some of the earlier American productions. The freedom of the present specimens from that quality was fully demonstrated by throwing them on the floor, and by other severe tests, which they withstood in a completely satisfactory manner.

Mr. G. W. Simpson said that he had used an ebonite bath for three months, and the nitrate of silver solution had remained unaltered during the whole of that time.

The Chairman then read a letter from Herr O. Kohnke, of Schleswig. The letter was addressed to the Secretary of the North London Photographic Society, and contained some photographs illustrative of the process referred to. The writer said:—

"Sir,—I take the liberty of forwarding enclosed to the honourable Society of Photography of North London some specimens, which are taken without chloride of silver paper, and without SO_3 natrum,* and which, in consequence of their unchangeableness, will enter into competition with other photographs.

"These photographs possess the following valuable preferences:—

"1. They remain unchangeable against light, air, dampness, and other matters to which they may be exposed.

"2. They are taken in the most simple manner.

"3. Several impressions may be taken quickly, should no essential retouch be required, in less than an hour, of one and the same negative.

"4. Any thick satin letter paper may be used.

"The discovery was made by myself, without the aid of Poitevin's method; and I should think is open to improvement, though based upon the most sure and simple method of production.

"My practical knowledge of photography is but of short duration, and possibly the representation of the negative and copies may not satisfy the artists: a practical man would, no doubt, with my means of discovery at his disposal, obtain better results. The copies are left, as may be seen, without any artificial additions.

"Against some favourable offer the discovery is at the disposal of any photographic society.

"Begging your pardon for having addressed you in my mother tongue, as I cannot find a proper translator—

"Yours, obediently, (Signed) "O. KOHNKE,
"*Chemist by Trade.*"

Some remarks were made by Messrs. Moens and Hill relative to the propriety of an amateur society such as the North London Photographic Society entertaining a proposition of the kind now before the meeting as a matter of trade; and, upon the motion of the Chairman it was finally agreed that the Secretary be requested to write to Herr Kohnke, stating that the Society was much interested by his communication and the examination of his specimens, indicating, as they seemed to do, the progress of photography in a new direction: the Society would be happy to receive particulars, and the members would doubtless work out any experiments which were necessary for the perfecting of the process, but it could not entertain the matter with the view of negociating a commercial transaction.

Mr D. W. Hill (the Treasurer) exhibited a copy of the presentation print for the current year, which was approved. The subject is *The Beach at Ilfracombe*, taken by Bedford.

The Chairman then asked Mr. Simpson to furnish some interesting particulars in connexion with the progress of the arrangements now being made for the exhibition of photographs at the International Exhibition of 1862.

Mr. Simpson said the particulars he had to lay before the meeting, though brief, were full of interest. In the first place, he thought he could assure those interested that the allotments of space would in a few days be in the hands of the various intending exhibitors. Secondly, he thought it matter for regret that it was not intended, as was originally expected, to make one grand exhibition of the photographs of the world, but that the photographs of each country would be exhibited in the division assigned to it. This arrangement had been acceded to by Her Majesty's Commissioners, in deference to the wishes of the French Commissioners. Furthermore, to the exhibition of English photographs it was intended to assign an amount of space which would not exceed that usually occupied by one of the annual Exhibitions of the Photographic Society; and in this small apartment it was intended to exhibit not only photographs but apparatus also. He feared the limited space would cause much inconvenience and disappointment, and the Committee,

* Hyposulphite of soda, doubtless—should be $Na\ O + S_2\ O_2$.

in assigning space to the various applicants, would be discharging a very arduous task, and enjoying anything but a sinecure: they would have to make a broad definition of the characters which admissible photographs should possess, and then exercise a sound discretion as to what should be admitted. It had been decided that none but untouched photographs should be admitted. He (Mr. Simpson) could not help thinking that it would be found difficult to draw the line between touched and untouched photographs; and, as an instance, he would direct the attention of members to the picture selected by the Committee for presentation this year to each member of that Society. There was abundant evidence of the clouds in the sky having been touched in in the negative; but was such a masterpiece of the art as that was to be excluded on that account. He could assure the meeting that the Committee was working very hard, and he (Mr. Simpson) doubted not that the best possible arrangements would be made under the circumstances.

Mr. Hill said he had understood that Mr. Wilson, of Aberdeen, had made application for space too late, and would, in consequence, be excluded from exhibiting. This he thought a matter for regret, as such photographs as he (Mr. Wilson) produced would reflect the highest credit on the photographic productions of the nation. He (Mr. Hill) would like to know how Mr. Wilson printed, as he never saw any prints of his marked with the disease called "mealiness."

Mr. Simpson, in reply, said he thought Mr. Hill was in error as to the probable exclusion of Mr. Wilson. He recollected having seen Mr. Wilson's name on the list at the office of Her Majesty's Commissioners. He thought his success in printing largely due to the superiority of his negatives.

An animated discussion then ensued as to the causes of "mealiness." The Chairman, Messrs. Simpson, Moens, Hill, Shave, Blanchard, Bingham, and Foxlee, took part in the discussion; and the opinions elicited and the experience narrated were of such a conflicting nature as to cause some merriment at the meeting.

Mr. Moens had observed that when through partial washing he had allowed some free nitrate to remain on the pictures they had toned more rapidily and were free from mealiness. He thought that the fact of the paper being albumenised gave rise to a difficulty in removing the silver salts, and that where there was an excess of albumen, and consequent excess of chloride, then mealiness occured. This might be corroborated by the common experience of every-day practice, in which it was observable that, when a print was taken on a piece of paper which had been hung up to drain and dry after sensitising, there was generally about an inch or an inch and a-half from the lower portion of the sheet which had a mealy character from the undue proportion existing in that part between the albuminate and chloride of silver, resulting in unequal toning, called "mealiness."*

Mr. Simpson said that Mr. Moens's remarks were confirmatory of those made by Mr. Henderson at the last meeting of the South London Photographic Society. There were two substances to be acted on by the gold salt used in toning: the chloride of silver was assuming the blue and slaty colour, while the albuminate of silver resisted the toning action longer, retaining its peculiar brownish-red colour. He thought mealiness arose from inequality of action among these substances. He might mention that he had had the advantage of a conversation with Mr. T. R. Williams, of Regent Street, on this subject, and he (Mr. Williams) had obliged him with his formula for albumenising, in which a much smaller proportion of chloride was used than was generally adopted by commercial albumenisers.

The Chairman very pertinently remarked that in the alkaline gold toning process photographers possessed a register of the relation between the chloride of silver and the albuminate of silver, as it was observable that where the minimum of albumen existed, and the chloride of silver was consequently in excess, the pictures assumed a bluish colour, and where the albumen was in the ascendant the pictures were red. He (the Chairman) thought that the complaint now under discussion might be most readily remedied by attending to those conditions best calculated to ensure an equality of action over the whole surface of the print. In reply to a question from Mr. Hill, the Chairman further remarked that mealiness was of rare occurrence on slightly albumenised paper. He had observed that the more highly the paper was albumenised the greater was the tendency to mealiness. The Chairman suggested, moreover, that gentlemen might satisfy themselves practically on many of the points now under discussion. One very instructive form of experiment was to print a tolerably large picture, cut it in half, immerse one-half at once into chloride of sodium solution, and remove all free nitrate of silver from the other by the most careful washing; then tone the two halves in the same bath and mark the result. It would be found that the half treated with chloride of sodium toned most rapidly, and assumed a bluish tinge, while the half so completely washed would take a much longer time to tone, and would, when finished, possess a tone suggestive of brown and red.

Mr. Hill had treated three samples of paper exactly alike in every particular: two were satisfactory, and the other mealy.

Mr. Bingham thought the difference depended more on the albumen than the paper.

Mr. Simpson suggested that the part played by the paper was in determining in what manner the albumen should lie on it; for, after it was once coated with albumen, its qualities, good or bad, did not materially influence the resulting picture. In qualification of this opinion, however, it might be stated that thick porous papers were more likely to give rise to mealiness than the thinner and smoother kinds.

The Chairman supported the views entertained by Mr. Simpson, maintaining that the structural character of the surface of the paper determined the quality in that particular possessed by the albumen *surface*.

Mr. Foxlee, notwithstanding Mr. Moens's experience of the effects produced by different kinds of water, stated that he had not observed any difference in the resulting prints whether he used common water or distilled in the preliminary washing. He had worked with samples of papier Saxe which were very good when freshly albumenised; but, after the lapse of a few months, the same paper yielded mealy prints.

Mr. Blanchard's testimony on the subject of mealiness having been solicited by the Chairman, he (Mr. Blanchard) observed that he was deeply sensible of the difficulty of obtaining good prints at all times. His experience led him to conclude that the use of chloride of sodium in the preliminary washing was disadvantageous. He had found that when an *uniform* condition of the surface of the print had been secured by long-continued washing, it was comparatively unimportant which salt was employed, as he had obtained equally satisfactory results with the acetate, phosphate, borate, and carbonate of soda. When he had first established these conditions, which experience had proved to be conducive to equality of chemical and mechanical constitution over the whole surface of the print, he was always successful. He thought that the preliminary washing and the toning should be conducted in a leisurely and thorough manner, as he had constantly observed that when these operations were hurried there was a greater proportion of mealy prints. If he were asked to state decidedly which salt he preferred for toning he would say the acetate of soda.

The Chairman remarked that hasty washing would produce an unequal deposit of chloride, and mealiness would be the consequent result.

Mr. Moens having spoken in favour of *hot* toning,

The Chairman remarked that the prints he exhibited to that Society about two years ago, in illustration of a paper by himself *On the Alkaline Gold-toning Process*, were all toned with hot solutions.

Mr. Simpson conceived that a hot toning bath would act more energetically on the albuminate of silver, making *it* tone as rapidly as the chloride of silver, and thereby securing uniformity of action.

Before adjourning the meeting the Chairman said he would pass round some very excellent stereographs of Conway and neighbourhood, taken by Mr. Bass; and, while the members were examining them, he would take the opportunity of saying that the Treasurer had directed his attention to the desirability of having the benefit of the experience of others laid before the Society's meetings, and if members would kindly bear this in mind, and prepare papers descriptive of their photographic doings (they need not be long: a short paper was better than none at all), he ventured to hope that there would not be another evening during the session similar to the present one, in which no paper had been read.

The meeting was then adjourned to Wednesday, the 19th instant.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of the Society was held on Tuesday, the 21st ult,—John Anthony, Esq., M.D., the President, in the chair.

After the transaction of the ordinary business of the Society, Mr. Frederick Whitlock was elected an ordinary member of the Society.

The President said it afforded him much pleasure to announce that Mr. Claudet had been elected by the Council an honorary member of the Society.

The discussion of the paper, *On the Constitution of Photographic Societies*, read by the President at the meeting of the 17th of December, and adjourned to the present, took place, and, after some preliminary remarks, the question of providing a glass room and laboratory accessible for the purposes of the Society was considered.

Mr. Rejlander was of opinion that as each member of the Society possessed a glass room, it would be better that the members should meet alternately at them than go to the expense of the rental, which would have to be paid during the whole year, while possibly the use of it for a few days only would be required.

A suggestion having been made that some difficulty might arise from such an arrangement, and that very few of the professionals could spare the entire use of their rooms even for one day during the season,

Mr. Rejlander still thought that some of the amateur members, whose rooms were only occasionally occupied, would place them at the service of the Society.

The President said perhaps the Secretary would be best able to give them information as to the probability of carrying out such an arrangement. For his own part he thought that a Society occupying the important position which this one did should be independent of individual members for a resting place. It was most essential that a better position should be provided for its meetings, where the library of the Society might be kept, and would always be available for reference during any important discussion, and where the members could test practically any new suggestion that, from time to time, might appear in the various periodicals devoted to the art.

The Secretary, in reply, stated that he was not aware of any room readily available. He had made inquiries, but could not meet with one anywhere suitable. He thought if the suggestion which he threw out at the last meeting could be acted upon, that they should endeavour to make an arrangement with the Council of Queen's College to hold their

* Mr. Moens has since thrown the substance of his remarks into the form of a paper, which will be found at page 39.

meetings there, and to have the occasional use of the laboratory, &c., that it would be beneficial to both, as perhaps the Professor of Chemistry might be induced to give lectures on the chemistry of photography, a department of the art in which the members were generally deficient. He would suggest that the Sub-Committee be appointed to make inquiries, and to report upon the subject.

Dr. ANTHONY fully concurred with the Secretary. A parallel case existed at King's College, London, which had opened its doors to the Parent Society, and the union had been mutually advantageous.

After some further conversation it was resolved—"That the President and Secretary be appointed a Sub-Committee to wait upon the Chemical Lecturer, and Mr. Sands Cox, the Secretary, of Queen's College, inquire in how far it will be possible to carry out the proposed arrangement, and report thereon to the next meeting."

On the question of procuring foreign periodicals the PRESIDENT called the attention of the members to the editorial comments upon that portion of his paper, which he proceeded to read. He had no wish to charge the journalists with *neglect*, but they were, in a great measure, dependent upon their *special correspondents*. He could cite, too, many instances to show that these gentlemen were not, in all cases, thorough exponents of the questions that continually arose in their localities, and if any one would refer to the information rendered to its readers by any photographic journal of what was being done in the art abroad, they would agree with him that, in the small amount of space devoted to them, no correspondent could fairly give even a faint outline, and might easily, in condensing, much misinterpret the subject. He need scarcely remind the members of the large circulation of the English photographic journals abroad, sufficient evidence of which appeared daily; and while the views of English photographers were thus disseminated among foreigners, it was only fair that the former should be placed in an equal position with regard to what was being done by the latter. Every step in advance of what had been done, whether in optics or chemistry, was important, and while they possessed the valuable works of Hardwich, surely, side by side with them, they should have those of men who occupied an analogous position in France, Germany, &c.; and the foreign journals, which must contain the discussions of the various societies, though they also contained much that was copied from ourselves, still were very little quoted by the English journals, He considered that the Society should be in possession of all literature on the subject throughout Europe; and in that a Society had an advantage over an individual—as the latter obviously could not afford to purchase all the works that appeared. Of course the foreign journals would contain reviews of British works, and it would be well to know in how far they could justify their observations. Important discussions must, from time to time, take place in Munich, Italy, &c., and the information they derived from those places was of the most meagre description. Photographers ought to glean something from the Italian journals, but they were almost inaccessible.

Mr. HART thought the foreign journals would be available to very few of the members; but to that it was replied that no doubt those of the members who could do so would take up the various journals, and explain anything that was new or important.

Mr. REJLANDER said that he had not found the foreign correspondents forward much that was important. He considered that it was the duty of reporters and correspondents to give fair reports of the progress of the art. He agreed that it would be of immense importance to the photographic world if the foreign journals were more widely distributed throughout the country. They should be able to form a more comparative estimate of the position of various countries and operators with regard to the art. Experiments must be carried on abroad; and, if the formulæ were published, it would be easy, had the Society a laboratory and glass room as suggested, to test practically their value. For his own part he kept no secrets; and, while anxious to get everything as perfect as possible, still he wished to concentrate the whole of his energies on the subject in hand.

The SECRETARY reminded the members that the meeting was fully competent to order a copy of any of the journals named to be procured; but as some difficulty seemed to exist as to the mode of obtaining them, it was decided that the matter should stand over for further consideration, and in the meantime inquiries should be instituted on the subject.

At this stage the continuation of the discussion was adjourned to next meeting, and the President invited Mr. Turner to exhibit to the meeting the apparatus he used for filtering the bath.

[The discussion on Mr. Turner's apparatus is unavoidably postponed till our next number.]

EDINBURGH PHOTOGRAPHIC SOCIETY.

The usual meeting of this Society was held on the 15th ult.,—James D. Marwick, Esq., President, in the chair.

After the minutes of the previous meeting had been read and approved of, the PRESIDENT, in the name of the Council, proposed that the following gentlemen should be elected as honorary members:—Hon. Henry Fox Talbot, Sir David Brewster, the Earl of Caithness, Professor Piazzi Smyth (Astronomer Royal for Scotland), Dr. Lyon Playfair (Professor of Chemistry, Edinburgh), George Shadbolt, Esq., London.

This proposal was unanimously agreed to.

A paper on the first principles of optics, entitled *Optical Laws Involved in the Construction of Photographic Lenses*, was read by Mr. W. K. WASON. [See page 41.] The paper was illustrated by a variety of large diagrams.

A vote of thanks was unanimously awarded to Mr. Wason.

CONVERSAZIONE AT UNIVERSITY COLLEGE.

THE Professors of the London University entertained a numerous company of scientific gentlemen at the College, in Gower Street, on the evening of Tuesday, the 14th ult. The Library and Museum were thrown open on the occasion, and the former of these we thought especially suited to the purposes of a *conversazione*. It is out of our usual province to notice such gatherings as that to which we now allude; and we should not do so now except to express our unqualified admiration of some photographs by Albert, of Munchen, from Kaulback's original etchings (or, more properly speaking, *drawings*) of illustrations of Gœthe's works. These pictures, which were contributed by Professor Harley, measured twenty-seven inches by twenty inches, and their peculiar merit consisted in the accuracy with which the photographer had succeeded in imitating the tone, texture, and other characteristic qualities possessed by the original drawings; so complete, indeed, was the deception, if we may be allowed to call it so, that we should have been disposed to regard them as drawings, as a matter of course, had they not been specially labelled photographs. It may be mentioned that, notwithstanding their somewhat extended area of 540 square inches, each picture was perfectly sharp to the edges, and the detail in all the parts was of the highest order.

It was much to be regretted that no description of the process by which they were obtained, or statement as to the construction, focus, and diameter of the lens, time of exposure, &c., accompanied either of the pictures. We cannot help thinking that had some of our brethren been present who are so prone to decry the *mechanism* of photography, they would, in view of these masterpieces of the art, have been disposed to moderate their censures.

M. Joubert worthily occupied a very large table at the head of the library in the exhibition of his now famous burnt-in photographs on glass. These have been so fully described, however, in previous numbers of this Journal, they do not require a special notice in this place; and we only allude to them, therefore, in connexion with the large photographs of M. Albert, as illustrating the prominent place which photography is gradually but persistently asserting for itself in the "circle of the sciences." It has come to be so naturally looked for, that something would be felt to be wanting at any *soirée* or *conversazione* where photography was not duly represented.

Among the works of art may be mentioned an elegant bust of the Princess Alice, by Mrs. Thorneycroft, to which a peculiar interest is attached, it having been the last thing touched by the lamented Prince Consort.

Messrs. Smith, Beck, and Beck exhibited their microscopes, Mr. Ladd his Ruhmkorff's induction coil, and Messrs. Horne and Thornthwaite their apparatus for spectrum analysis. This latter attracted considerable attention, and kept Mr. Martin, who represented that firm, actively lecturing during the whole of the evening. The sodium, lithium, and barium spectra were beautifully exhibited by the apparatus.

Foreign Correspondence.

Paris, January 28th, 1862.

LIKE many others I had for years past followed the works of Mr. Maxwell Lyte with interest. At the different Exhibitions, both in France and in other countries, I had admired his fine landscapes—so artistically conceived, so delicately rendered; and having followed him in his progress from good to better, I had finished by thinking he had attained that pitch where progress needs must stop. But I was in error. The other evening the specimens intended by Mr. Maxwell Lyte for the Exhibition at London were submitted for the inspection of the members of the French Photographic Society, and every one, like myself, was amazed at their perfection. The subjects are those which the author is so fond of, and which he so well understands, being sites taken among the Pyrenees. We noticed particularly the *Lake of Gaub*, the *Bridge of St. Sauveur*, the *Valley of Argelès*, the *View of Pau*, &c. All these pictures are of a larger size than that hitherto adopted by Mr. Lyte.

A few years since M. Louis Rousseau, a naturalist attached to the Jardin des Plantes at Paris, made photographic reproductions of some parts of the scientific wealth in the midst of which he was living, and that for the purpose of contributing to popular instruction. The idea was good: the execution was difficult. M. Rousseau, however, laboured with activity, and his efforts were honourably encouraged. Particular circumstances interrupted his labours; but, fortunately, an *employée* of the Museum of Natural History, whom M. Rousseau had initiated in his essays and projects, thought it well that the work should not stand still, and therefore continued it with much intelligence and skill. The collection with which this artist, M. Potteau, has favoured us, after submitting it to the Photographic Society, is very numerous and interesting. The part which struck us especially, on account of its requiring but little special knowledge for its appreciation, was that comprising types of the different races of mankind. Thanks

to his persevering activity, M. Potteau has been able, without leaving Paris, to bring together specimens of most of those races. He is ever on the watch. Every time a foreigner presenting characteristic features enters the garden, M. Potteau allures him into his operating-room, and lets him not depart till his full-face portrait and his profile have been taken. All the faces are executed with the same apparatus, and the models are always placed at the same distance from the objective, in order that the differences may be better appreciated. It is not artistic effect that the author seeks, but correctness.

I have before me M. Reynaud's paper on the various iodides and bromides employed in the preparation of photographic collodion, of which I said a few words at the time it was read. The whole paper is too long to be summarised here, but I can give its conclusions. The author lays down this general rule as resulting from his experiments :—the quantity of iodine contained in the collodion (not only the free iodine, but that also existing in the iodides employed) should be in the average proportion of one gramme per hundred cubic centimetres of normal collodion.

It is advantageous, in ordinary cases, to employ together the iodides of potassium, of ammonium, and of cadmium. When maximum sensitiveness is desired, care should be taken that the collodion contains but very little free iodine.

If the film of collodion get spotted during the sensitising, although its opaline hue indicates that it does not contain too much iodide, yet the defect may be attributed to a too great excess of iodine. If the colour of the collodion be not more than an orange yellow, the operator may be sure that the effect is caused by a too large proportion of iodide of ammonium as compared with the other iodides.

Lastly, if the collodion grows veiled, iodine should be added till an orange-yellow colour be obtained. For this purpose an alcoholic solution of iodine is employed, so that the colour of the iodine may be judged of by simply shaking.

With regard to bromides, those of ammonium and of cadmium appear to the author to possess the most largely that property which leads to the use of these bodies in photography, and which is that of increasing the sensitiveness of collodion to red, orange, yellow, and green rays. The bromide of potassium gives to the collodion a finish similar to that produced by the iodide of that metal, without, however, diminishing the sensitiveness. The proportion of bromide which appears to M. Reynaud the most suitable in wet collodion is three or four grammes per twelve grammes of iodide and one litre of normal collodion. Too much bromide would produce a whitish veil, which would take away all vigour from the picture.

M. Reynaud recommends the use of the iodide of ammonium, because it possesses mixed qualities, allowing it to be employed alone, or in combination with a little bromide of ammonium, He also mentions the liability of the sensitive film to become spotted at the moment of immersion in the sensitising bath. and attributes that defect to the decomposition of the iodides of ammonium into iodide of silver. The undulations of the bath in movement are marked upon the film, and irregularities in the surface ensue. The use of a vertical vessel is a means of avoiding this accident. The same spots are also produced when the collodion contains a considerable quantity of free iodine, which is manifested by an orange tint. Lastly, these spots are also found when the collodion contains too much iodide, especially if the silver bath be rich and new.

The 31st of December was dark and cloudy throughout the day, so that it was impossible to take any photographic observations of the eclipse. Fortunately it was not so everywhere. I have received from M. Vernier, jun., of Belfort, some interesting images of the different phases of the phenomenon. Were your photographic astronomers more fortunate than ours of Paris?

ERNEST LACAN.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PORTABLE BACKGROUNDS.

To the EDITOR.

SIR,—In your last number, viz. 158, at page 35, an inquirer asks about "Portable Backgrounds," of which you have given him every information; but it occurs to us that it could not affect the interests of your Journal, and doubtless would be of considerable importance to ourselves, besides being a possible convenience to your correspondent and others, if, in addition to giving them instructions, you referred them to us, who fairly expect to execute orders for those things in consideration of the great expense incurred in advertising.

If you will kindly refer your inquirers to our firm, you will greatly oblige. We are, yours, &c., J. T. & G. BULL.

Great Queen Street, London, W., 16th January, 1862.

[As a rule, correspondents always prefer having their apparatus from dealers to making it for themselves; and therefore, while affording the information sought, we generally refer also to advertisements *if we happen to have noticed them.* We have nothing whatever to do with the *business* of the Journal, and had forgotten that such articles as we described were "in the market" until the receipt of your note, when the name recalled the fact that they were described by one of our staff in the "Record of Photographic Inventions." Messrs. Bull's advertisement will be found in our advertising columns.—ED.]

To the EDITOR.

SIR,—Your description of a background is almost literally that of one which I made, and find not to answer. Perhaps you will allow me to point out to "Amateur" a few of its defects, whereby I may perhaps save him some trouble. In the first place, I found a frame seven feet by four a most inconvenient thing to carry in or out of the house, requiring much careful steering to get it round the corners without digging pieces of plaster out of the ceiling and walls and getting the handles and hasps of doors through the canvas. I also found that seven feet high was not quite enough to admit of taking *cartes de visite* on the same scale as those of professionals, without showing the top of the background. Again: it would not stand the least wind without blowing down, unless stayed with cords; and, lastly, having, I think, like most amateurs, only one room, to which I am expected to confine all my "mess and litter," as my apparatus is irreverently called, I found that taking out the background raised such a dust as to render the room quite useless for some hours.

I am trying to scheme a substitute, but at present do not see my way clearly, and shall be glad of any hints.

January 20, 1862. I am, yours, &c., ANOTHER AMATEUR.

[Supposing you have a frame-work fixed out of doors, or any place where you can *hang* a background, pieces of old oil-cloth make a capital support for your surfaces.—ED.]

MICROMETRY.

To the EDITOR.

DEAR SIR,—In your Leader on "Micrometry" in the number for September 16th, which has just reached me, the name of the originator of the application of photography to this subject seems to be passed over. Prior to Morfitt, and prior to Maltwood, is (as you may see by referring to page 240 of the fourth volume of the *Microscopic Journal*, April, 1856) the claim of Yours, faithfully, WILLIAM HODGSON, M.A.

Moore College, Liverpool, New South Wales,
Nov. 22nd, 1861.

CHEMICAL PROBLEMS.

To the EDITOR.

SIR,—Will you oblige me by answering the following queries :—

No. 1.—Suppose I have a plain salted paper, and sensitise it upon a nitrate of silver bath of just sufficient strength to convert the chloride of ammonium into chloride of silver and leave no nitrate over and above—and suppose one minute is required to do so—will floating for two minutes with the nitrate of silver of half the previous strength have the same effect?

No. 2.—Does this conversion take place instantaneously? and, if not, how long floating does it require to effect it?

No. 3.—Suppose I float a sheet of paper on chloride albumen, and wish it to take up the albumen and salt in the proportion of three of albumen to one of salt, how many grains of salt must I use for each ounce of solution consisting of equal portions of albumen and water? Q. R.

[No. 1.—We have some doubt whether you have correctly expressed what you desire us to understand. As you have put the question no general reply would suffice. Of course there is no difficulty in calculating how much nitrate of silver will *exactly* decompose a given quantity of chloride of ammonium, and this quantity dissolved in water might be made of such a strength as to occupy the time of one minute in the conversion. By doubling the amount of water, the relative strength of the solution would be doubled; but it does NOT therefore follow that two minutes would be the time required for the conversion in the latter case. But a more important difficulty exists to carrying out your supposition: the exact quantity of chloride of ammonium taken up by each sheet of paper after being floated on a solution for a given time would *not* be known, different sheets having differing absorptive powers, and this holds good even of parts of the same sheet. It is not very difficult to determine the *average* quantity taken up by each sheet composing a number; but this is not enough for our purpose.

No. 2.—The conversion does not take place instantaneously, though sometimes pretty rapidly; and the time occupied is influenced by the strength of the solutions, but not necessarily in arithmetical proportion.

No. 3.—To three ounces of albumen and three ounces of water add one ounce of salt. The water simply dilutes the albumen and is dissipated on drying the paper. Its effect is not to alter the proportion between the amounts of albumen and salt, but to make the paper retain a less quantity *pro rata* of each.—ED.]

IODINE IN THE BATH.

To the EDITOR.

SIR,—I have been experimenting with iodine in the nitrate of silver bath, as recommended by l'Abbé Laborde, viz., putting a very small piece of iodine, weighing about the sixth part of a grain, into the bath, and allowing it two or three days to produce its effect. The result was far beyond my expectation. The plates had always (before the use of the iodine) become covered with a white veil of reduced silver, as well as sundry black marks, of which it was impossible to get rid without the iodine. I should have mentioned that I was working with instantaneous collodion—Messrs. Horne and Thornthwaite's, I think. I would strongly recommend to all your correspondents to try this method. Hoping that my communication will be useful, I am, yours, &c.,

January 24th, 1862. CHARLES E. BURTON.

P.S.—In my next I will give an account of my experience with regard to development with iron without free nitrate of silver.

[M. Girard has shown that this practice is not based upon sound theoretical principles, and is only advantageous when the bath is somewhat alkaline—a condition that can be as well or better remedied by the proper application of nitric acid.—ED.]

TRANSPARENCIES FOR THE LANTERN.

To the EDITOR.

SIR,—Any of your readers who may feel inclined to amuse themselves by the production of pictures suited for the lantern may obtain beautiful tones and transparent whites, by using that ubiquitous liquor, *beer*, as a preservative. Proceed thus: Coat, excite, and wash; then apply the preservative, and dry before a dull fire. It is now ready for exposure under a negative, which, near a good gas light, should take from fifteen to forty seconds, or even more, according to the density of the negative. It must now be slightly washed, and the ordinary pyrogallic acid developer, with a few drops of silver added, poured over it, when, in the course of two or three minutes, the picture will be out all right. I am aware there is nothing new in all this; but the success of the results attending this simple plan is such as induces me to give it for the benefit of your readers. T.

DECOLOURISING THE PRINTING BATH.

To the EDITOR.

SIR,—On the information of a friend, I have discharged all colour from my paper sensitising bath by the following simple means:—Make a solution of common kitchen salt in water, and add a drop or two to the coloured nitrate bath; then shake well up and filter. Do not add too much of the salt solution, as it will waste the silver. As I thought this might interest some of your numerous readers, I have troubled you with it, although it may not be new. I am, yours, &c., A. R. T.

[The method is well known to many.—ED.]

PANORAMIC LENS.

To the EDITOR.

SIR,—Seeing in your Journal a somewhat unfortunate notice of some pictures in the Edinburgh Exhibition, taken by the above lens, I examined them more carefully than I otherwise would have done, and find that they are indeed deficient in definition in some parts; and some more so than others. But I cannot see how it can be otherwise. To be at all sharp, the picture must be received on a plate, curved not only horizontally, but *vertically*—in other words, it must be taken in part of a hollow sphere, such as a watch glass; and as this will be attended with difficulties of no slight kind, I fear this lens will not be of much use to the practical photographer. To me it seems a *mathematical* impossibility that it can take a correct picture on a plate curved only horizontally.

Edinburgh, Jan. 24th, 1862. I am, yours, &c., MENISCUS.

[The critique was by a very practical photographer, and we have no doubt the allegation was well founded. But there are, nevertheless, many subjects of a particular class for which the panoramic lens is well adapted. It must not be forgotten that all objects in a landscape cannot be in the same plane, and, consequently, some must be a little out of focus whatever the lens employed; and this is correct in an artistic point of view. By a *judicious* use of the focussing arrangement which is supplied by Mr. Ross with the "panoramic" (although its inventor repudiated the necessity for it), we are not of opinion that there *need* be any offensive indistinctness in subjects to which the lens is adapted.—ED.]

DAGUERREOTYPE.

To the EDITOR.

SIR,—What of the daguerreotype process this long time? Is it for ever dead? As I have a great itching to try my hand at it I should be glad if you would give me such information about it as would enable me to succeed with it. I may state that I can take both positives and negatives by collodion, but the mysteriousness and difficulty said to overhang the daguerreotype strongly induce me to make a trial of it. I am further induced to this step by an inspection of the loveliest set of little portraits you ever saw, executed by this process—so delicate, so transparent, so pearly in the whites. Do, Mr. Editor, ask some of your correspondents to favour me with a few hints how to produce them.

I am, yours, &c., MARY B——

[We publish your note as the readiest way of obtaining a reply for you. We do not personally practise or admire the process, and believe it to be nearly defunct.

IRON PRINTING.

To the EDITOR.

SIR,—A most interesting process of iron printing has recently appeared in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY as being newly discovered by a gentleman in Ireland. I beg to state that I discovered this process more than a year ago, as I will furnish documents to prove to your satisfaction, if required; and, on the principle of rendering honour to whom honour is due, I claim any credit that may attach to this discovery. I am, yours, &c., B. T. MACDONALD.

London, Jan. 17th, 1862.

[See Leader: also article by J. T. Taylor.—ED.]

ANSWERS TO CORRESPONDENTS.

☞ A correspondent sent to the Publisher a note, enclosing an advertisement for this *Journal*. Unfortunately they have been mislaid. The Publisher inserts this notice in explanation of the non-insertion of the advertisement, and he would feel obliged by the writer's forwarding another copy of the advertisement and instructions.

L. A.—We shall notice it in due course.

C. FARLEY.—Received. Thanks for your good wishes.

T. R.—The idea is good: we shall make a "note" of it.

S. S. LEES.—We have handed your query to Mr. Highley.

AMAPHOUS.—We are unable to comply with your request.

J H. S. (Birmingham).—Quite correct. Mount upon black or dark grey, and you will get a capital effect.

A SUBSCRIBER.—The Publisher cannot at present supply a portion of the numbers you require. Several numbers of the last volume are "out of print," but are in course of being reprinted.

OLD HYPO.—We do not find that the editor you name commits so grave an error as you attribute to him. If you will look again you will find that he protests—perhaps not so energetically as he might, but he does protest.

A. B. (Workington).—We have never heard of anyone having photographed the interior of an iron mine; but from what we have seen of the effect of the illumination of a mine by means of ordinary blue fire (Bengal light), we have no doubt it would be possible to produce a picture by its aid.

A CONSTANT READER.—Your query is not one of a photographic nature, but we would readily have given you the information if it were in our power. You can, however, ascertain who is the patentee of the articles named by application at the Patent Office, Southampton Buildings, Chancery Lane.

S. W. A.—The first-named maker's lens is very good for a cheap lens; but certainly not nearly equal to that of the other maker: the latter does well for copying also. We have no further news of Osborne's photographic process than that we have already published. Mr. Ramage, of Edinburgh, has done some very good things in this direction, but has *not* published his method.

STEREO.—The article you mention as having appeared in the pages of our several contemporaries is from *Silliman's Journal*, though not so acknowledged by some of them. We had it before us several months back, but not considering the suggestion of value we did not care to reproduce it. We shall probably comment thereon shortly, as it rather oddly charges us with a misapprehension which certainly did not exist with us.

J. W. P.—The negatives that are *perfectly yellow*, to which you allude, are probably such as have been developed with an iron salt, and subsequently intensified by pouring on a solution of perchloride of mercury, by which a deposit of the proto-chloride of mercury is obtained on the proof; and this after being well washed is converted into the yellow iodide of mercury by the application of a solution of iodide of potassium.

J. M.—The markings of which you complain arise from your collodion being *too gelatinous* in character, possibly from less of ether; this is very apt to be the case when iodised with a cadmium salt. The addition of a small quantity of *pure* ether will remedy the defect if owing only to the first-named cause; but if it be partly owing to cadmium as an iodiser, add from five to ten drops of chloroform to each ounce of collodion. This will precipitate the pyroxyline in the form of gelatinous beads; but they become redissolved on shaking up the bottle, and afterwards the collodion will flow evenly and smoothly. Your portrait is not in good focus.

CHIRURGICUS.—1. To architecture only—not so good in our opinion for ordinary landscape work as the single combination.—2. A lens constructed for a ten by eight plate is of shorter focus then that generally used for a twelve by ten plate, and the former consequently delineates a subject upon a *smaller scale* then the latter, and therefore includes as much of the subject on the small plate as the other does on the large plate. To meet your requirements you had better have the lens for the smaller size, and use it for the larger plate when you are in the predicament named. You will perhaps lose a little at the angles, but you can cover the effect by rounding the corners of your prints.

E. B.—The plain paper print *is* mealy, insufficiently printed, and over-toned: the former is caused by insufficient printing, upon which no toning can be effective. This is the case also to some extent with the albumenised paper print. Alkaline gold toning has a tendency to produce purple, not black tones: the latter can be more readily attained by printing very deeply, and toning with an acid gold bath. The coloured specimen is not a bad first attempt by any means; and the print on plain salted paper is about right for colouring in water. You should carry a deeper wash of colour, say raw sienna and madder pink, over the flesh, to give a little more of the flesh and blood appearance, and a little less of the chalk or paper; and then stipple over such tint with the colours you now use.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 160, Vol. IX.—FEBRUARY 15, 1862.

Celestial Photography.—Our readers will no doubt be pleased to learn that the gold medal of the Royal Astronomical Society has just been bestowed upon Mr. Warren De la Rue, for his successful application of photography to automatic registration of celestial phenomena. This is the highest honour in the power of the Council of the Astronomical Society to award, and it is with no little satisfaction that we find that august body so prompt to recognise the value of our art as a faithful and infallible witness of the exact appearances of phenomena some of which are so transient in their nature that there is no time for comparison of notes between two or more observers before the phenomena themselves have disappeared. It is not assumed that Mr. De la Rue was the first to apply photography to the illustration of celestial bodies. Mr. Bond, assisted by Mr. Whipple, in America; Mr. Hartnup, aided by Mr. Forrest and others, at Liverpool; Mr. Hodgson and Mr. Crookes, in London; and probably some others, were labourers in this branch of science before the former. But in beauty and certainty of the results obtained—in the successful adaptation of apparatus to the special requirements of the astronomer—in the detection of certain important truths deducible from the photographic records obtained—and, above all, in the particular branch of heliography, Mr. De la Rue's labours are pre-eminently conspicuous.

Amongst the most interesting discoveries made by the intervention of photography, applied as we have intimated, we may cite the ocular demonstration, by means of the stereoscope in connexion with the lunar photographs, of the spherity of our satellite, and of the nature of many of the more obscure markings upon its surface, clearly distinguishing elevations from depressions. More recently similar treatment of the solar images has shown that the faculœ or spots on the sun's surface are really due to elevations of the outer regions of the photosphere; and, further, that by the invention of an ingenious micrometer, capable of application to the images of the celestial bodies, very accurate measurements can be effected, and already the discovery has been elicited that in the ordinarily accepted diameter of both the sun and moon some corrections have to be made. We greatly rejoice that so worthy a recipient of honour as Mr. Warren De la Rue, whose labours have been both valuable and superlatively disinterested, has not been neglected, and their graceful recognition does equal honour to himself and to the Astronomical Society.

The Photographic Society.—We cannot but regret that the last meeting of The Photographic Society was brought so unexpectedly and abruptly to a conclusion by the President quitting the chair, without affording to the members an opportunity of making any remarks upon the Report which had been read, or upon the balance sheet which was upon the table, but which was not seen, we believe, by many others than the officers of the Society. In alluding to this subject, we would premise that we do not for a moment mean to cast any ill-natured reflections upon the estimable gentleman who so kindly presides over the Society, and whose attendance must cause no small sacrifice of personal comfort to one who has attained a time of life when most men are disinclined, even if able, to attend meetings, still less to take an active part in the proceedings; therefore there is an additional debt of gratitude due to one who not only does this, but who is frequently engaged for many hours previously in performing the onerous duties of a judge. As will be seen in another column, immediately after the Report had been read, and the new members of Council and officers had been considered as elected, with a few brief words of acknowledgment, the President inadvertently vacated the chair, but returned for a few moments more, at the instigation of a member of the Council, to propose the reception and adoption of the Report—a few hands being held up when the affirmative question was put, and none in response to the negative, and so the affair ended. We presume that the agenda paper was either absent altogether or deficient in the information that a motion upon the reception of the Report had to be made. We express regret that such a *contretemps* as we have described should have occurred—not because it manifests an amount of carelessness on the part of the officers of the Society, though that is objectionable enough, but because we are aware of the existence of a great amount of dissatisfaction amongst many of the members, whether well or ill founded we do not decide; however, as it exists (and of this we have no doubt, very many members having expressed the same to us pretty emphatically), it was a great mistake, under the circumstances, not to give an opportunity for free vent to such feelings. Some at least of the sources of irritation would have been removed by explanation; others may have arisen altogether from some misapprehension; but, under any circumstances, it is worse than useless to attempt to stifle the expression of such feelings. Now, from a personal knowledge of some of the facts connected with the subject, we have no hesitation in affirming that nine-tenths of the malcontents would have been satisfied had discussion been encouraged.

Part of the discontent arose from the circumstance that at the previous meeting no business was permitted to be done, as a mark of respect in connexion with the address of condolence, by which omission a list of officers and members of Council intended to be nominated in opposition to the "home list," so as to ensure a *bona-fide* election, was prevented from being tendered in accordance with the rules. Some complain that they have no copies of the rules, and know nothing about the provisions: others object that they do not know anything about the real position of the Society, whether it is increasing or decreasing in number of members, or even of how many members it consists. These are only a few of the complaints made, but they are sufficient to indicate their general character.

With respect to the Report that was read, many objected that there were several matters assumed as facts which were very questionable and in this we cannot but concur—indeed, but for the informal way in which the motion for the reception

and adoption of the Report was conducted, had no one else anticipated us we should certainly have objected to its adoption: the reception might have been admitted as a mere matter of course.

As an instance of the assumption of a questionable fact, it is stated in the Report that the negotiations with the Royal Commissioners were brought to a successful issue—most persons interested being of opinion that the issue is pre-eminently unsatisfactory. We do not question that the Council of the Society adopted the best alternative left to it, but that the negotiations brought about anything approaching to success is unhappily far from being the fact. How, indeed, can such an assumption be entertained when no concessions have been made by the Royal Commissioners—not even the separate apartment promised—no separation between pictures and apparatus—no modification of the objectionable classification—and, to crown all, the total space afforded to the display of the art being simply contemptible?

With regard to this subject we urged upon the Secretary the importance of inaugurating an ordinary Annual Exhibition of the Photographic Society, in addition to the International Exhibition; and, on mentioning the matter to some members of the Council, we found them favourable to such a project. We also suggested an application to the Crystal Palace Company as better than nothing; but there were several serious objections to this course of proceeding. Another idea was also started in connexion with the following announcement in several of the daily newspapers, viz.:—

> International Supplementary Exhibition.—A responsible company has been formed to erect, from the designs of Sir Joseph Paxton, a Supplementary Exhibition building at Kensington, for the accommodation of persons who may fail to obtain space in the International Exhibition. The design is likely to answer a useful purpose, and is being prosecuted by sound men in a business-like way, and with the approbation of the Royal Commissioners, the idea being to afford facility for the sale of goods displayed in both buildings.

But here again difficulties arise, so far as the Photographic Society is concerned. Lastly, we suggested that application be made to the authorities of King's College to ascertain whether it would be possible to obtain the use of the large hall there for the purpose during the summer vacation, and thus effect the object, at the same time avoiding the expense of a separate *soirée;* but this, we presume, has also turned out to be impracticable, as we find that the *soirée* has been fixed to take place there on the 25th April next.

We cannot avoid thinking that it would be but an act of ordinary prudence as well as justice on the part of the Photographic Society to obtain some exhibition room at almost any reasonable cost, in order to avoid a reduction of its income, as well as to remedy as far as possible the disappointments to which the whole body of photographers have been subjected; and we have heard that a gallery is obtainable at the corner or Pall Mall end of the Haymarket, but the truth of this assertion we have not actually tested. We are, however, of opinion that very strenuous exertions ought to be made by the authorities of the Photographic Society to effect this object.

We altogether deny the correctness of the following statement in the Report as to contemporary photographic societies:—

> "The number of these have gradually diminished as the advantages of one central and representative body have been recognised throughout the country."

Two or three societies have ceased to exist, it is true; but others have been established, and, what is of more importance, some have received very considerable accessions of members during the past year. To have borne out the assertion to which we object, it would have been incumbent upon the framers of the Report to have shown that the number of members of the Photographic Society is now greater than it has ever been—a position which we think it would be proud to establish.

ON THE MANUFACTURE OF COLLODION.*

By Thomas Sebastian Davis.

There are few investigations in connexion with modern photography that possess greater theoretical, chemical, and practical interest than those associated with the manufacture of collodion. The interest and importance of the subject are not exclusively derived from scientific considerations, but are intimately associated with the greater or less facilities that the compound is capable of affording for the production of artistic effects. It is true that the pictorial merits of a photograph can only partially constitute the standard for a just estimation of the exact value of a collodion or process; yet it is equally undeniable that the conceptions of a cultivated taste may be fairly expected to realise a nearer approximation to its sentiments when aided by the more appropriate agents. Regarded in this aspect, the manufacture of collodion, and the characteristic results dependent thereupon, constitute a theme of recurrent interest, and one which from time to time should be brought under our notice, in order to adapt its qualifications to the current requirements of the artistic photographer.

The preparation of collodion embraces the consideration and realisation of two especial qualifications: the one the production of a medium that will possess the necessary physical properties of yielding a homogeneous and even film after evaporation from a smooth surface, and the other the power of giving an image possessing the nearest approximation to a true representation of the varied gradations of light and shade, as seen in nature. The former requirement directs our primary attention to the constitution of the plain collodion, and the latter to the nature of the salts best adapted for receiving the actinic impression. I purpose in the present paper detailing the methods by which the above conditions may be most satisfactorily attained, according to the result of my own varied experiments in connexion therewith. It may be well here to remark that the special formula which I am about to advocate is the one which I have especially found advantageous to adopt in working the wet collodion process, with iron developers, and the washed albumen dry-plate processes generally. It is one by which a collodion may be prepared in every respect adapted for yielding the best results with pyrogallic acid development; but under such circumstances the necessary impression of the latent image is received with less rapidity than upon films prepared with one or two commercial collodions particularly distinguished in this respect. It may be judged, therefore, from the latter observations, that I neither advocate or recommend the practical or artistic photographer to make his or their own collodion. But this I would emphatically urge—that no modified form of development, nor any description of a dry-plate method of preparation, should be esteemed of scientific value unless it be capable of being successfully practised in combination with a collodion of known chemical composition.

To turn in the first instance to the consideration of the manufacture of the pyroxyline, I may notice that its introduction into photography previously resulted from the discovery of M. Schonbien; that the elements of nitric acid are capable of combining with certain vegetal fibres; that the compounds resulting therefrom possess new and remarkable properties. The development of this fact led to the knowledge of the practical value of gun-cotton, and consequently to the specification of a patent taken out in our country in the year 1846 by a Mr. John Taylor, of the Adelphi, for the manufacture of explosive compounds. In this specification we have a detailed description of the means by which "gun-cotton" of the most explosive character may be successfully prepared. I shall venture to make one or two extracts therefrom, inasmuch as they will contain some practical hints equally applicable to the manufacture of photographic pyroxyline:—"The vegetable matter," it states, "which is found best suited for the purpose is cotton, in the state in which it comes to this country, but cleared from any extraneous matter, it being desirable to operate only on the clean fibre of the cotton, which should be dry. The acids which I employ are nitric acid of from 1·45 to 1·50 specific gravity, and sulphuric acid of 1·85 specific gravity. As far as my experience goes the best mode of using them is to mix them in the proportion of one measure of the nitric acid with three measures of the sulphuric acid, in a convenient vessel of glazed earthenware or other material not acted on by acids. By this mixture great heat will be produced. The mixture will be allowed to cool until it reaches a temperature of from sixty to fifty degrees of Fahrenheit. It should be introduced as open as practicable; and, in order to ensure the cotton being fully impregnated with the acids, and every part equally and fully subjected to the action

* Read at a Meeting of the South London Photographic Society, Feb. 13th, 1862.

thereof, the cotton, when in the acids, is to be moved or stirred by means of a rod of glass, or other matter not acted on by the acids. The acids are then to be poured or drawn off. * * * The cotton is afterwards to be washed, opened out, and dried, which may be conveniently done by spreading it thinly on surfaces in a room heated by steam or otherwise to about 180° Fahrenheit, and when dried it is fit for use. I would remark that nitric acid alone produces on cotton an effect similar to that produced on cotton by the mixture of acids above mentioned. But, in carrying out the invention with nitric acid alone, the cotton should be removed and washed immediately after it has become soaked with the acid; but I believe that so good a result cannot be obtained by the use of nitric acid alone, and the product is more costly." It will be gathered from the above extract that the principle of the manufacture of gun-cotton is not dependent upon the relative proportions of the mixture of the acids, although the preference is given by the patentee to the three to one ratio, as more recently advocated by Mr. Hardwich. The explosive cotton made in acids of the above strengths is unsuited for the manufacture of collodion, inasmuch as the product is insoluble in a mixture of alcohol and ether. If, however, we only dilute the acids to a suitable extent or what is analagous thereto, take acids of a less specific gravity, and act upon the cotton therewith, we shall obtain a pyroxyline soluble in an ethereal mixture of alcohol, and distinguishable from the former, when saturated with water, by a semi-transparent appearance and a tendency to partial disintegration. Provided we carry the dilution of the acids to too great an extent, the texture of the cotton will be entirely destroyed; if to the extreme degree, it will be completely dissolved as soon as immersed in the acid mixture. The disintegrating or solvent power of the dilute acids increases with an elevation of their temperature, so that it happens that an acid mixture in which the fibre of the cotton would be scarcely altered at a low temperature might entirely dissolve the whole at a higher one. As it is found that a more fluid collodion can be manufactured from a pyroxyline made at elevated temperatures, it follows that the strength of the acids must be correspondingly less diluted when used at higher temperatures, in order to produce a given action upon the same vegetal fibre.

The essential element for consideration, therefore, in the manufacture of pyroxyline adapted to meet the requirements of the photographer, is the proportionate dilution of the acids that will give the best results when brought into union with the normal cotton at some fixed temperature ranging between 130° and 150° Fahrenheit. The above rule will equally apply to the case whether the nitric acid be used in its free condition or be liberated from nitrate of potash by the chemical action of the sulphuric acid thereupon. As far as my own experience has led me to a preference between the use of free nitric acid or the employment of nitrate of potash, I must confess that I consider a slight advantage in respect to uniformity and suitability is gained by the combination of the two. Without, however, dwelling upon this point, I must now proceed to the statement of the means by which I manufacture a pyroxyline equally adapted for the production of collodion to be used for the wet and dry plate process.

To make the pyroxyline:—Take 3¾ ounces (avoir.) of ordinarily dried and pounded nitrate of potash and mix it in an earthenware jar, with 10½ fluid drachms of water. Pour upon this 4½ fluid ounces of nitric acid, of specific gravity 1·42, and 8¼ fluid ounces of the strongest commercial sulphuric acid, specific gravity about 1·845, and intimately mix the whole with a glass rod. As soon as the mixture is at the temperature of 150° to 145° Fah., introduce 100 grains of finely-divided cotton, in small quantities at a time, taking especial care that each quantity is saturated with the acid before the introduction of the next, and allow the whole to remain at rest, standing upon a non-conducting surface for about ten minutes. After the lapse of this interval, press the cotton with the glass rod against the bottom of the vessel, and pour off as closely as possible the fluid mixture. The pyroxyline should then be quickly washed in three or four changes of water, and subsequently in several additional ones, with the precaution of pressing as much of the moisture as possible from the cotton between each change: by so doing the cotton will be quickly and thoroughly freed from the slightest trace of acidity. As a precautionary measure one or two of the latter washing waters may be rendered slightly alkaline by the addition of a few drops of ammonia: that used for the final cleansing should be neutral and distilled. The cotton may now be allowed partially to dry spontaneously, but the last traces of moisture should be driven off by the aid of a hot water bath. As the quantity of water in the above formula constitutes the element of success or otherwise in the manufacture of the pyroxyline, it may be as well to refer to the extreme ranges and the resulting effects. If we add twelve fluid drachms of water instead of the ten and a-half recommended the result would be that the greater portion of the cotton would be dissolved in the acid, and the remainder, if washed and dried, would be found to dissolve but sparingly in ether and alcohol, and yield a powdery, incoherent, and unsuitable film. If, upon the other hand, we were to reduce the quantity of water to eight fluid ounces, we should find that the cotton would be scarcely altered in its appearance when washed and dried—have but little solubility in an ethereal mixture—and yield a film possessing a "crapy" texture. It thus follows that all the more characteristic pyroxylines may be produced by a comparatively trifling alteration in the strength of the acids. When, however, the water is added to the extent given in the instructions, the detached particles of cotton will give a milkiness to the first washing water; it will present, when wet, a semi-transparent appearance when held up to the light; and after subsequent desiccation will dissolve easily and without leaving a residue, either in glacial acetic acid or an ethereal mixture of alcohol. From this pyroxyline the plain collodion is to be made as follows:—

Ether, methylated (sp. gr. 720 to 730)...	4½ fluid ozs.
Alcohol (sp. gr. 837)	1½ „
Pyroxyline	6½ grains.

The methylated ether referred to above can be commercially obtained of either the above strengths: the alcohol is the ordinary rectified spirit of 56·60 over proof of the distiller.

The sensitising solution to be added to the plain collodion is a question of importance, second only to the manufacture of the pyroxyline. I deem it exceedingly desirable that care should be taken that the addition of the sensitising solution to the plain collodion should not be attended with the slightest precipitation; rather that the slight milkiness which the plain collodion may retain even after long standing should immediately disappear upon the addition. In order to ensure this effect I recommend that a weaker alcohol should invariably be used in the manufacture of the plain collodion than that which is employed as the solvent for the salts. I am aware that the greater facility with which the salts employed are dissolved by the weaker spirit has led to a practice at variance to the one advocated; but under such circumstances a precipitate generally occurs. The composition of the iodising solution is to be as follows:—

Iodide potassium	6 grains.
Iodide cadmium 18	„
Bromide potassium	2 „ (in excess.)
Chloride ammonium.....	2 „ „
Alcohol (sp. gr. ·805)	1 fluid ounce.

I give the preference, for chemical and photographic reasons, to the combination of iodide of potassium and iodide of cadmium over the combinations of other iodising salts; and the stability and solubility of the latter combines conveniently with the instability and sparing solubility of the former. The alkaline iodide is, moreover, eminently qualified to give a great and excessive vigour of intensity, whereas the metallic salt by itself imparts an image of the opposite character. A combination of the two in the above proportions yields probably the best image that can be realised by the use of iodides alone. The preference may be given to the potassium iodide over the ammonium, inasmuch as the former is less liable to decomposition and the consequent liberation of free iodine than the latter. The iodide of sodium is almost identical in its action and properties with iodide of potassium; but, as the latter can be obtained with greater facility in a state of purity, convenience suggests its employment. The effect of adding chlorides and bromides to the combination of the above salts is to lessen the exaggerated contrasts which are likely to attend the use of a plain iodised collodion, to give greater immunity from stains and fogging, and, what is of considerable moment, permit a longer exposure where necessary for the delineation of objects situated in shade, without the prevention of the vigorous rendering of the higher lights. The beneficial effects of the chloride of ammonium will be but trifling as far as regards the use of the collodion for the wet process. It will give, however, greater sensibility, increased brightness of the negative, and general correctness of tone to the plates, from which the whole of the free nitrate of silver has been washed away for the purpose of applying a preservative. With respect to the introduction of the potassium bromide in preference to the bromide of ammonium, it may be remarked that, although it be less sparingly soluble in alcohol, yet for negative pictures in combination with

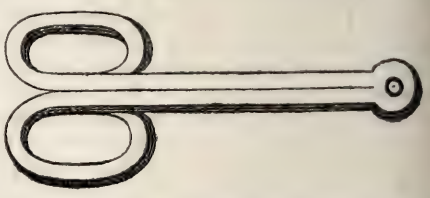
mixed alkaline and metallic iodides, it is sufficiently so to produce the desired effect. By its use we prevent the possibility of double decomposition, which, under certain circumstances, may otherwise take place. The salts, as described, should be dissolved without heat in about three-fourths of the alcohol, and, after having been frequently shaken therein for two or three days and carefully filtered, the remainder of the spirit may be then added. The iodising solution is to be mixed with the plain collodion in the proportion of one volume of the latter to three of the former; and it will be found that the resulting compound will meet every possible requirement of the artistic photographer, with the exception of very rapid sensibility. In furtherance of the object of obtaining increased sensibility I have tried many published and original experiments, but without meeting with any marked success unaccompanied with some serious inconvenience. The generality of these experiments have been directed to the introduction of such salts into the sensitising solution as form, by double decomposition with nitrate of silver, insoluble compounds more or less affected by actinic power. The salts which can be successfully introduced for the purpose are obviously limited to those which are partially soluble in a mixture of alcohol and ether, and afford insoluble compounds when the electro-negative element enters into combination with the metallic base. In accordance with the above conditions I have selected for my experiments the acetates, malates, citrates, succinates, benzoates, arsenates, arsenites, cinchonates, &c. The only instances in which I have obtained any indications of increased sensibility have been in those in which the salts introduced have possessed an alkaline reaction. Amongst these I may especially mention the arsenite of potash. As the silver salts of a character so formed are prone to reduction under the influence of the ordinary developing agents, their employment is to a greater or less extent attended with a general fogging of the picture. In following out some experiments in connexion with sensibility, I introduced the ter-chloride of gold into the sensitising solution, in the place of the less soluble chloride of ammonium. The exaltation of sensibility caused by this addition was both marked and decided; but the known facility of reduction to which this salt is subject, apart from the influence of light, under the action of pyrogallic and protosulphate of iron solutions, defeated the possibility of its successful application. So great is the aptitude of this salt to reduction that the introduction of a single plate covered with a film containing a mere trace thereof is sufficient to render a large quantity of the nitrate of silver bath solution inapplicable for further photographic purposes. It was, therefore, with some surprise that I subsequently found that Mr. Barnes, in his excellent and able *Manual* upon the use of collodion upon a thin substratum of albumen as a dry plate process, had not only tried but suggested the use of chloride of gold as an accelerator many months before the date of my experiments. As a general result of my researches in this direction I am inclined to endorse the opinion heretofore expressed, that at the present moment we must use, even if we are not to rest satisfied with, collodions of ordinary sensibility, and that we have not as yet discovered any "accelerator" of unexceptional utility. We may, however, perfect the manufacture of such collodions by a critical study of those minutiæ to which I have endeavoured to direct attention in the present paper.

PRACTICAL INSTRUCTIONS FOR GRINDING LENSES.

PERHAPS the branch of science connected with our art which is least familiar to the majority of its professors is that which relates to the optical questions involved; and amongst those who are acquainted with the theoretical principles of optical science, very few indeed know anything about the practical method of constructing lenses. That some information upon this subject will be of interest to our readers we cannot doubt. Even those who would not for a moment contemplate the idea of attempting to manufacture their own lenses, will still be glad to be acquainted with the mode in which they are produced: while others who have a taste for experiment may like to try their skill in this direction, if only as a matter of curiosity: while a still more select few—whose inventive faculties are active, and who fancy they could contrive certain arrangements of lenses which would be of high photographic value, *if they could only get their ideas carried out by some practical mechanician*—may have in these articles the information afforded to them by which they may become independent of anything but their own industry, in putting their schemes to the test of actual trial.

We have made arrangements for the publication of a short series of articles explanatory of the mechanical details involved in the actual manufacture of the glass parts of lenses of various kinds, believing that such will be more or less acceptable to a large proportion of our readers. We shall not treat of theoretical questions in these papers, as they would be foreign to our present purpose, and may well be left for separate consideration; but we shall, in as lucid a manner as possible, give the *modus operandi* adopted by the artisan in the actual production of lenses such as are required by the photographer.

We will commence with a description of the method of grinding a convex lens of crown glass. The first operation consists in bringing the piece of glass selected into the form of a circular disc a trifle larger than the size of the intended finished lens. This is effected by cutting or rather chipping it into shape by the aid of a tool something like a pair of scissors in form, and called by the workmen "shanks." This tool is made of soft iron, and is used much as a pair of scissors would be—the principal difference consisting in the fact that in the latter the fulcrum of the lever is placed between the hand and the object operated upon, while in the former it is at the extremity of the tool—and the glass is placed between it and the hand of the operator. The following cut will give a better idea of the appearance of a pair of shanks than we can convey by description alone. As it will be perceived that it would be next to impossible to hold a flat disc of glass without some assistance while grinding it to a convex surface, the next thing to be done is to attach something to it to be used as a handle, and the substance employed for this purpose is a cement, made as follows, viz.:—

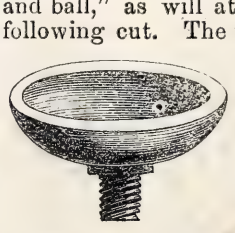


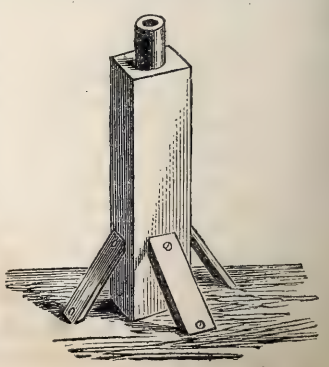
Into a pot or ladle put *half a pound* of common *pitch*, and melt it over the fire; then stir in a *table-spoonful* of fine *wood ashes*, and a piece of *tallow* about the *size of a nut*. Keep the whole simmering for at least a quarter of an hour, and stir well, so that the whole may be thoroughly mixed; then pour it out on a piece of wet stone, and keep it well kneaded about until nearly cold.

While preparing the cement, or, if it be ready, for some time before using it, place the piece of glass on the hob of a common fire grate, which must contain burning coke or charcoal (*not* coal, as the flame or heat from coal is apt to cause the glass to fly), in order to make it gradually and sufficiently hot to cause the cement to adhere firmly. Then take a lump of the cement, enough to form nearly a hemisphere when applied to the glass disc, and knead it into form on the glass, thus causing it to afford a good finger hold. Before doing anything more to it the whole must be allowed to stand for an hour or more, until it has become quite cold.



It is now necessary to bring the exposed surface of the glass to an approximately correct spherical curve by grinding it in a concave metal "*tool*," by the aid of coarse emery powder. The tool is in form very like the "cup" of the well-known toy, the "cup and ball," as will at once be perceived from an inspection of the following cut. The upper side is indented with a cavity having its surface accurately ground to correspond with a sphere of a given radius; the lower or outer side is left in the rough, and is furnished with a projecting piece or boss, upon which is cut a male screw of a certain definite size—every "tool" in the workshop being furnished with a similar projecting screw, and all of them of the same size, so that the same handles and sockets will fit any of them. The optician's workshop is furnished with a number of upright posts, firmly attached to the floor, and steadied by means of wooden stays. At the top of each post is a metal socket, furnished with a female screw, into which the male screws of the several tools fit. In addition to these posts, there is in some convenient part of the workshop a kind of sink lined with lead or slate, and having in it several square boxes or sockets (rising from the bed of the sink) into which the "rough tools" for the first grinding are laid.





The tool of the proper curvature intended to be used having been

arranged in its place in the sink, and some coarse emery powder and water having been placed into the cavity, the glass, with the cement attached as before described, is placed in the tool, glass downwards, and worked about with the hand all over the tool in every direction, at the same time causing it to revolve slowly, by twisting it with the thumb and fingers. At first the glass only touches the tool on the extreme edges of the former; but gradually a dull grey ring is formed near the edge by the glass becoming partially ground away, and this ground ring increases in breadth until only a small central spot is left polished, and finally that also disappears, and the whole surface acquires an uniform rough grey appearance. Of course, in working the lens about on the tool a quantity of the emery and water gets forced over the side of the tool and falls into the sink, which is, in fact, placed for the express purpose of collecting it, partly to prevent making more mess than is needful, and partly for a more important purpose, which will be named hereafter. After being roughly shaped, the embryo lens is now transferred to a similar, but this time carefully figured tool, screwed on to the top of one of the posts before-mentioned. Into this tool some fine emery powder, moistened with water, is placed, and it is gradually smoothed all over its surface by aid of a piece of common glass, of any kind that has been previously brought into shape in the rough tool, precisely in the same manner as the intended lens—the same piece of glass serving for very many times for the purpose. Its object is to coat the tool evenly with the emery, and at the same time break up any accidental lumps that may have found their way into the fine emery, and which, if not dissipated, would cause an infinity of trouble by making a number of scratches on the lens. When the emery is evenly spread, and not till then, the lens is introduced and worked in a similar manner to that previously described, but with more care; and, when a nice even surface of an uniform grey appearance is produced, both the tool and the lens are carefully washed free of all the emery in use, and the same tool is replaced and supplied with some still finer moistened emery powder, and another grinding of the lens is proceeded with, precisely as before. The emery is thus changed five or six times, in some cases, where a very perfect surface is required, finer emery being used at each time of changing, until at last the lens is ready for being polished, so far as that surface is concerned. A description of the polishing process we must defer till our next communication, as also the method of constructing the tools, which we have judged it better to suppose already in existence, because when their object and the method of using them is understood it is much easier to comprehend the design of the various proceedings necessary in constructing them; and there is always greater facility in describing an instrument when its use is known than is the case when we have to do so with that of which the reader is entirely ignorant. We shall, therefore, in our next explain how the tools are to be made, and then continue with the finishing of the lens.

ON THE CHEMICAL EFFECTS OF LIGHT.*

By M. A. Poitevin.

(*Continued from page* 45.)

Before using the salts of uranium as reducing agents for persalts, I had, in March, 1857, tried the action of light upon lactate of uranium, which has been indicated in the *Annals of Chemistry*, by Mellon and Rissit, 1848, page 281, as being very sensitive, and reducible to the state of oxide by the action of light; I knew, besides, that the yellow salts of protoxide of uranium were brought into the state of green salts of protoxide of uranium, and that their solutions reduced those of gold and silver; but I did not know the application which had been made in England of the nitrate of uranium to replace the citrate of iron, in the chrysotype process of Herschel.

I prepared then some paper with a solution of lactate of uranium, and exposed it to light, under a negative. A very sharp image was formed, of a brown colour, which disappeared on being washed with distilled water. With the object of fixing it, I employed several re-agents, without success: there was nothing but nitrate of silver which would fix it and blacken it at the same time.

This experiment seemed to me very curious, and as admitting of useful application in printing positive proofs. I did not, however, continue these researches, too much occupied, as I then was, every day, in perfecting some photographic impressions of which I hoped to make an industrial application.

It was not until some little time after that M. Niépce de St. Victor began his photographic researches on the salts of uranium, the results of which were laid before the Academy of Science, but which I only became acquainted with through what appeared in the Photographic Journals for August, 1858, and March, 1859. These labours of M. Niépce were not conducted from a chemical point of view—the proof of which is, that he explains the reduction of the salts of gold and silver by the salts of uranium exposed to light, as being produced in an inclosed chamber which had been exposed to light, thus confounding the effect with the cause.

I did not renew my experiments with the salts of uranium until the early months of 1859: I then, however, succeeded in perfectly satisfying myself as to the nature of the reaction which I had observed in 1857. I established anew the fact that the salts of peroxide of uranium applied to paper were reduced by light to the state of protoxide, upon which solutions of the salts of gold and silver produced a deposit of metal; and, further, that ferrocyanide of potassium formed very beautiful red positives upon nitrate of uranium paper exposed under a negative. I fixed these by a simple washing with pure water, or with water slightly acidulated. I also changed the red colour into a blackish violet, by treating the proof with a very weak solution of perchloride of iron, which transformed the ferrocyanide of uranium, which is red, into ferrocyanide of iron, which is Prussian blue. The mixture of these colours produced a violet of more or less deep shade. By prolonging the action of perchloride of iron upon these proofs, I obtained a blue print which I could at pleasure convert into an inky black (gallate of iron), as I have previously stated.

The experiments upon nitrate of uranium employed alone upon paper are very numerous and well known. I am unable to say anything new on this subject, and will, therefore, confine my observations here to the application of this salt mixed with others in the state of persalt, with the object of accelerating their reduction by light.

Nitrate of Uranium and Bichromate of Potash.—When a solution of nitrate of uranium is added to a solution of bichromate of potash, a pale yellow precipitate of chromate of uranium is produced, soluble in excess of the nitrate. Paper covered with this mixture is yellow: it whitens at first in the light, then becomes rose-coloured, and on treating the paper with a solution of nitrate of silver, chromate of silver is formed on all the parts affected by light. It is the same reaction as this which is produced by employing alloxantin and bichromate of potash, and which may be printed in the same way. Only it should be observed that here the nitrate of uranium is not in the state of protosalt in the insolated parts, for it will reduce the nitrate of silver; but, after it has been exposed to light, it renews the oxygen to the bichromate of potash. A solution of ferricyanide of potassium colours of a brownish red the parts unaffected by light, through the formation of ferrocyanide of uranium. A solution of ferricyanide does not produce any apparent effect; but, on subsequently treating the paper with a solution of perchloride of iron, Prussian blue is formed in the parts impressed by light.

A solution of tannin does not produce any apparent effect; but, on the subsequent addition of perchloride of iron, ink (tannate of iron) is formed only on the actinised portion of the paper.

Nitrate of Uranium and Bichloride of Mercury.—Paper prepared with this mixture is very sensitive to light, which reduces the bichloride to the state of protochloride of mercury, which may be darkened by a solution of hyposulphite of soda, or by water rendered slightly ammoniacal.

Nitrate of Uranium and Perchloride of Iron.—This mixture applied to paper is discoloured very quickly by light: from yellow it becomes white. Protoxide of uranium is first produced in the insulated parts, reacts upon the perchloride, which it reduces to protochloride: the solutions of gold and silver are reduced by this protochloride of iron. Ferricyanide of potassium colours the unimpressed portions brown, owing to the formation of a mixture of ferricyanide of iron and uranium. Ferricyanide of potassium forms Prussian blue on the actinised portion of the paper: this reaction is very clean and sharp and might be utilised, since it is easy, as I have already said, to change this blue into tannate or gallate of iron. Solutions of tannin, gallic acid, pyrogallic acid, &c., produce ink on the parts which have not been acted on by light, that is to say, where the perchloride of iron is not reduced. This reaction is also very sharp, and it is this especially which I have endeavoured to utilise, and upon which I have based this method of obtaining photographic impressions, which I published on the 20th of May, and which is inserted in the *Bulletin of the French Photographic Society* of June, 1859, page 157, *et. seq.*

I continued my experiments on the reduction of different persalts

* Read at a Meeting of the Marseilles Photographic Society, January 31st, 1862.

of iron, with a view to their application to this kind of impressions: nearly all may be employed, and even the sesquioxide itself mixed with a reducing agent; but it is the nitrate of the sesquioxide which is most easily reduced after the perchloride. I sought also for less expensive reducing agents than alloxantin and nitrate or lactate of uranium, and I have established the fact that glycerine, nitrate of ammonia, and, above all, tartaric acid, may be advantageously substituted. It is tartaric acid which I have used ever since, and on the 18th of May, 1860, I made another communication on a second process of printing in gallate of iron and Prussian blue, with specimens upon paper and upon woven fabrics: this also appeared in the *Bulltein de la Societe Francaise de Photographie*, June, 1860, page 147, *et. seq.*

POSITIVES.

Proofs obtained in this manner, and by using a positive for the impression on paper, are always wanting in sharpness on the surface of the paper, which is so penetrated by the colour as to look better when viewed by transmitted light, thus indicating the quality of the paper employed. If it be desired to obtain sharp proofs in this manner it will be found necessary to employ collodionised paper, which I prepare as follows:—Upon a well-cleaned glass I pour a film of ordinary plain collodion, immerse in water, and when the greasiness is gone, withdraw it, wash repeatedly with acidulated water, and to the still moistened surface I apply with moderate pressure, so as to ensure contact over the whole surface, a sheet of paper which has been previously coated with a solution of gelatine, containing ten per cent. perchloride of iron and three per cent. tartaric acid. If the pressure has been properly applied, it will be found, on withdrawing the paper, that the collodion film adheres to its surface. This paper is very sensitive to light and yields very sharp and vigorous proofs. It was during the course of these latter experiments that I observed the impermeability communicated to paper by this mixture of perchloride of iron and tartaric acid, which impermeability is immediately destroyed by light. I had hoped to make an useful application of this observation to the production of impressions by means of lithographic inks, charcoal powder, &c.; but while endeavouring to effect the substitution of glass for paper, I discovered the new and curious fact that light communicates to these preparations hygroscopic properties, which led me to, and which is the basis of, my second method of taking impressions in carbon and other inert powders, and for which I obtained a patent on 28th June, 1860, and which process I published on 26th October, appearing in the *Bulletin de la Societe Francaise de Photographie*, November, 1860, page 304.

THE DAGUERREOTYPE PROCESS.

By Charles Corey.

I ENTIRELY agree with your correspondent, Mary B——, as to the great superiority of the Daguerreotype process *for portraits* over all others. There is in photography no mode of representing the human face that does so much to soften the awful truth-telling of the camera as that of the too-much-neglected discovery of Daguerre.

I have by me now some pictures taken by this process fully fifteen years ago, and for delicacy, brilliancy, and general harmony of effect there has been nothing in the subsequent discoveries to equal them.

If you have no better information at hand, I shall be happy to answer your appeal to your readers by a short account of the method of procedure.

As nearly the whole of the work is dry, and the result of vapour only (and, therefore, an additional recommendation may be enumerated, inasmuch as the fingers and clothes are kept from being soiled), it is imperatively necessary that the whole apparatus be in a perfectly working condition; for the many makeshifts of the solutions of silver for glass positives are inadmissible here.

The picture being produced by the known affinity of mercury for silver—the light parts formed by a graduated deposit of it, upon a surface of polished silver—our first position must be obtaining the needful boxes for iodine, bromine, and mercury. The large outlay and cost of plates has gradually deterred many from its use, and led to the awful degradation to which portraiture has in part sunk.

The plates (of copper coated with silver), supposing them to be used for the first time, are chemically, as well as mechanically, cleaned by being rubbed, laterally, or from side to side, upon a buff of drab cotton velvet or moleskin, stretched tightly upon a flat board, and having lamp-black, previously freed from its inherent grease by being burnt in a crucible, dusted upon the buff through fine muslin. When perfectly bright and finished, by the use of another and clean buff, and leaving its markings across the plate (laterally as before said), it is lightly dusted with cotton or a camel-hair brush to remove all loosely adhering particles, and, whilst rather warm from the friction, it is laid upon the opening of the iodine box and the glass cover withdrawn. At the lower portion of this box a glass reflector is placed, by means of which the gradual coating of the polished plate with the iodine vapour may be watched. When it has attained a bright rose colour—say in about two minutes or more—it is enough, and the glass cover may be replaced. There are many methods of charging this box with the vapour of iodine, but I have found a few grains of purified iodine in a watch-glass, at the centre of the bottom of the box, the best.

When thus coated the plate possesses a certain degree of sensibility; but the time of exposure would be so great as to render it unfit for portraiture in this state. The world is indebted to the labours of Mr. J. T. Goddard for eliciting the accelerating efficacy of bromine, thus reducing the time of exposure from minutes to seconds in the camera. Bromine was formerly used as a liquid, the bromine being diluted with water. Its effect was greatly heightened in intensity, beauty, and rapidity by the addition of chlorine; but as this application involves the use of a Wolf's apparatus, with connecting glass pipes and bottles, and Welter's safety tube, it is out of the question for tyros, particularly of *le beau sexe*. We will, therefore, adopt the handy form of Mr. Bingham's bromide of lime, which must be scattered with greater profusion than the iodine over the bottom of a similar box. The plate must now be exposed to this vapour until the hue has become of a blue tinge: being returned to the iodine box for an instant only afterwards, it is ready for the slide of the camera. It is surely unnecessary to say that these operations are to be conducted in an entirely dark room, the only light that is to be used being a square hole in a shutter that has been covered over by white paper, in front of each box, and this too in a north aspect where the atmospheric light is greatly modified.

The exposure will vary according to the manner in which the proportions of the vapour of iodine and bromine have been balanced, and may be roundly stated to vary from ten seconds to twenty, or even thirty.

The plate is then carried back to the dark closet, and placed in its proper receptacle in the top of the mercury box, and a lighted spirit lamp put under the iron cup at the bottom, into which clean mercury has been poured. The heat is to be gradually raised till the thermometer indicates 120 degrees: a few degrees more or less is of little importance. An imperceptible vapour of volatilised mercury gradually rises, and condenses slowly upon the surface of the plate wherever the light has eaten away the fugitive coating of bromo-iodide of silver—thus forming the gradation of the picture. The effect is to be watched by occasional but not too frequent peeps at its progress, by the help of a lanthorn with an amber glass front. When fully developed it must be removed, as the mercury continues to vapourise, even when the heat is discontinued. As a rule, it is better to under-expose and gradually develop, rather than to force a picture out by a rash and precipitate heating of the mercury. When the development is complete it is slipped easily and slowly into a basin containing a solution of two ounces of hyposulphite of soda to a half-pint of water, and may then be allowed for the first time to see the day-light.

So soon as the superabundant purple covering of iodine and bromine is dissolved away, it may be lightly washed and placed upon a stand that will admit of being so accurately levelled that a large quantity of hyposulphite of soda and gold may be retained upon it. This solution is thus prepared:—Dissolve thirty grains of hyposulphite of soda in four ounces of water, and sixteen grains of chloride of gold in other four ounces of water. When thoroughly dissolved, pour the gold into the soda salt, stirring assiduously the while. Set it aside and it will change from a brownish yellow to quite white, and it is then fit for use. Pour on as much of this as the plate will hold without spilling and apply the heat of the spirit lamp underneath until it almost attains the boiling point. The gold will thereby be deposited in the form of a thin and invisible coating on the surface, greatly heightening the effect of the picture. Nor is this all: as gold is infinitely less subject to the action of the oxygen of the atmosphere than silver—for we know the latter tarnishes readily, whilst the other does so but slowly—the thin pellicle of gold acts as a protective coating to its surface, and its subsequent keeping either under rough usage or exposure to air will reveal if it has been properly gilt or not.

As the solution is exhausted each time it may be thrown away; the plate to be taken by its corner with a pair of pliers, a quantity of distilled water flushed over it, and then being reared up, still held by the pliers, whilst the spirit lamp is held to the back, the

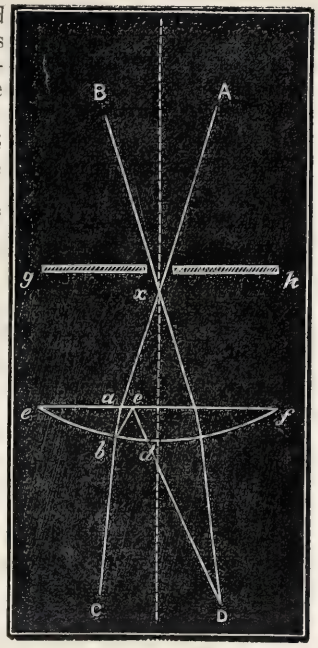
heat expels the moisture gradually to the lowest corner, leaving the plate quite free from stain, *et voila tout, certainement le chef d'œuvre* of the art of portraiture.

Mr. Atkinson, of Liverpool, had some time ago a large assortment of the needful apparatus, and, as he is a clever operator, he would no doubt willingly afford further information.

PRACTICAL OPTICS OF PHOTOGRAPHY.

By J. Rothwell.

No. XII.



The way in which light is reflected internally from the surfaces of lenses is explained by examining the adjoining figure. *e f* is the lens, which we will suppose to be a common view lens; *g h* the stop in front of the lens; A is a bright or light-coloured object, or one from which light is strongly reflected, and the image of which is focussed at C; B is a weakly-lighted object, or one in shade, of which the image is at D.

Now suppose a ray or pencil of light from A going through the aperture *a* of the stop, along the line of direction *x a*, and striking the front surface of the lens at *a*, it will be reflected at *a* in the direction *a b*; and supposing *x b* to be the radius of the convex or back surface *e b d f* emerging from the back surface at *b*, except a small portion which, instead of emerging, will be reflected back to the front surface at *c* in the direction *b c*, a portion of it will then be reflected a second time by the front surface at *c* in the direction *c d*, and emerging at *a* will proceed and fall on the image of B at D, the effect of which will be to fog and obscure the image D. Now suppose the power of the light from A to be ten times as strong as that from B, and one-tenth of that light (that is from A) to be internally reflected, then it is evident that the light which goes to form the image D and that which goes to obscure it are equally strong; consequently no very clear or satisfactory picture could be obtained under those conditions. Commonly, when a picture is fogged at all, it is worse in the middle than towards the edges. The reason of that is easily explained, I think; for, if an object be situated beyond A near the margin of the view, the pencils from it strike the lens so obliquely that the internally-reflected light is turned the contrary way to that I have explained above, and therefore does not fall on the plate at all, thus leaving the margin of the picture comparatively free from diffused light.

In the diagram the stop is represented as being at a considerable distance in front of the lens—in fact equal to the radius of the convex surface, which is more than the usual distance. By a little investigation it will be seen that, according to what has been explained above, the extent of space in the centre of a picture which is fogged is influenced by the distance of the stop in front of the lens; thus when the distance is increased the fogged space is enlarged, and when the stop is brought nearer the fogged part is diminished. Therefore it must follow from this that the best position for the stop, with a view of avoiding fog in the centre, is that it be in contact with the lens. With respect to the best position of the lens for avoiding a fogged centre, that represented is worse than if the convex side were towards the objects. It has always been found, I believe, that a compound arrangement, whether of two or three lenses, gives a picture more fogged in the centre than a single lens under like circumstances—which is just what might be expected—and, further, that the greatest part of the evil is caused by the back lens. Although the subject has often been referred to, I do not think the mischief caused by diffused light in the camera, or what is reflected by the internal surfaces of tubes or by a faulty system of mounting lenses, has received that attention which its importance demands from practical photographers, and which, I have no doubt, has a good deal to do with pictures being fogged about their central parts.

Any person wishing to convince himself practically of the truth of what I have advanced in this paper may do so as follows:—Take a picture of a building in such a manner that the building covers the whole length of the plate, both horizontally and vertically, thus shutting out all the sky, and it will be very clear and free from mistiness. Then take a second with the top of the building in the middle of the plate, the upper half of the view being sky, when it will be seen that at the middle of the top part of the building—that is, about the centre of the view—there will be more or less mistiness. If in a third picture, with the building covering only one-fourth or one-third the plate vertically, it will be comparatively free from mistiness, much more so than the last, although there is much more strong light from the greater extent of sky—thus proving conclusively that the central mistiness is the result of internally-reflected light from about the centre of the lens. In these experiments I am supposing the atmosphere to be clear, but the sun not shining. But if the sun were shining on the front of the building, there would be less mistiness in the second picture. Why? Because the direct sunlight would increase the power of the light reflected from the building, say five times, but such would not be the case with the light of the sky; for, if the sky be bright, there is no great difference in the photographic power of its light, whether the sun be shining or not. Therefore, I repeat it once more, if a very clear sharp picture be desired take it in strong sunlight with a small stop, and let the stop be in contact with the front of the lens,* and the lens a single one. Many things have to be considered as regards the position of the camera, the time of day, the peculiarities of the view in relation to the manner in which the various objects in it are illumined, &c. Every photographer knows the difficulties of avoiding black patches and inexplicable blanks in some kinds of views—all which result from the way in which objects are lighted, together with the colours of them, the position of the camera, and the direction in which it is pointed from that position, and also the state of the chemicals.

Suppose a view of a river which opens out into the sea, including rising banks on both sides, be desired, in what direction should the sun be shining, and in what position should the camera be placed, for producing a picture which would be most admired generally? In such a case I should wish to have the sun shining not straight down the river towards the sea exactly, but somewhat obliquely across it, say from the right bank. I would place the camera on the left bank—not close to the water's edge, but high up the bank, and pointed in the direction for including the extent of view required. By this means a view pretty evenly lighted would be obtained, but still not deficient in shadows; and, by having the camera high up the bank, there would be less mistiness about the centre of the picture than if it were close to the edge of the water—for this reason: that if the camera were close to the water its elevation above the surface would only be a few feet, and therefore the angle of reflection of the light from the surface would be great, and, when that is so, a greater amount of light would be reflected than when the angle of reflection is small.

This brings me to another point which I know has puzzled many photographers, and probably opticians too—namely, that a distant part of a flat surface, whether it be water or land, always appears in a picture much lighter than the foreground in comparison to what it ought to be. For instance, if the middle distance seems right as regards the exposure, the foreground is underdone and the distance overdone. I believe the principal cause of this to be as follows:—It is well known that when the angles of incidence and reflection are large—say from 60° upwards—a greater amount of light is reflected from any flat surface than when those angles are small, say from 30° downwards. This is readily seen in a photograph of a lake or river. A greater quantity of light is reflected from any given extent of surface—say a circle of three feet diameter at a distance of 100 yards—than would be reflected from the same space at ten yards distance.

My special aim in these papers has been to point out the defects and evils dependent upon the optics of photography, and how to remove or avoid them. If I have not satisfied the expectations of some, still I hope my writing will have done the art some little service; and with this I conclude the series, leaving plenty to be done by every one who takes the subject up.

* If this advice were sound why then use a lens larger than the stop?—Ed.

ON A NEW VARNISH FOR GLASS POSITIVES

By D. Van Monckhoven.

Every one knows that, as a rule, glass positives are varnished at the back with a black compound consisting of bitumen of Judæa dissolved in turpentine. This practice is subject to several inconveniences.

Spirit of turpentine, however pure it may be, even when it has been distilled, becomes resinous when exposed to the air, particularly under the influence of light. This alteration takes place more rapidly when the collodionised glass being covered with varnish the excess of varnish is returned to the bottle which contains the store. Thus the varnish, good to begin with, does not last long without becoming sticky and liable to scale off, and, further, the time required in drying becomes more and more prolonged.

One great defect of this varnish is its becoming detached in scales, especially under the influence of considerable changes of temperature; but it is possible to reduce, and even to remedy entirely, this defect, by adding to the turpentine some shreds of India-rubber.

Some years ago I pointed out how spirit of turpentine may be replaced by oil of naphtha, produced by the distillation of gas tar. But this naphtha, good when recently prepared, becomes worse and worse. Instead of evaporating in a few minutes, it at length requires half-an-hour to produce complete dessication.

The following is the formula for an excellent varnish, which dries almost instantaneously, and which possesses all the qualities requisite for photographic purposes:—Place in a bottle

400 parts, by weight, of Bisulphide of carbon.
32 „ „ Bitumen of Judæa (Jews' pitch).
1 „ „ Gutta-percha, or of caoutchouc, in very thin shreds.

After the lapse of some hours, especially in the summer time, the solution is complete. The mode of using it is as follows:—

The plate, after removal from its last washing bath, is drained for several minutes, then covered with a solution of gum arabic in water and allowed to dry completely.

Without the use of gum the varnish rapidly penetrates the film, more particularly in the summer time.

The glass being dry, it is to be covered with the varnish above described as rapidly as possible, for the film dries almost instantaneously. If the varnish do not seem to be sufficiently thick, the quantity of bitumen may be increased.

It is as well to operate in the open air, for the bisulphide of carbon while evaporating, possesses an intensely disagreeable odour; but this defect is amply compensated by the rapidity with which the film of varnish dries and its adherence to the plate.

I would add one observation. It is that glass positives have much better effect when taken upon blue glass. Such proofs have greater softness and present a more velvety appearance. But on the Continent coloured glass is only with difficulty procurable, and still more so at a low price, even if routine, which so much stifles progress, were not a sufficient reason against its adoption.

RESEARCHES ON THE PHOTOGRAPHIC PROPERTIES OF THE BROMIDES AND IODIDES OF SILVER, WITH ESPECIAL REFERENCE TO THE CIRCUMSTANCES UNDER WHICH THEY ARE OBTAINED.*

By M. E. Reynaud.

The numerous photographic processes at present known are founded on the sensibility of the salts of silver to the action of light. Among these salts chemists have recognised as being most applicable to photography the iodide, bromide, and chloride of silver, on account of their possessing the required property of sensibility to actinic influence in an exalted degree. Photographers have therefore naturally directed their attention to these salts, and by consequence to those salts which produce them by double decomposition in the collodion film. It will be found expedient, therefore, to study the different properties of the iodide, bromide, and chloride of silver, according as they are produced by the decomposition of one or other of the soluble iodides, bromides, or chlorides, or by the direct action of iodine, bromine, or chlorine.

The following are my researches in this direction, which I now have the honour to lay before the Society.

I shall confine myself in the first instance to the study of the principal salts employed in the wet collodion process. Iodide of silver first presents itself to our notice, this salt being the basis of sensitised photographic collodion.

It is well known that iodide of silver is obtained by the double decomposition of an iodide and nitrate of silver contained in the sensitising bath. We have then to examine the different properties of iodide of silver, according as it is produced under one or other of the following conditions:—

1. If the collodion contain in solution either iodide of potassium, iodide of ammonium, cadmium, &c., or several of these iodides together, or an excess of iodine.

* From the *Bulletin de la Societe Francaise de Photographie.*

2. If the sensitising nitrate of silver bath be acid, neutral, or alkaline.

Let us suppose for a moment that the silver bath is slightly acid, as is the case in ordinary practice, and let us begin our studies by the examination of the photographic properties of *iodide of potassium.*

A well-known fact is the slowness with which iodide of silver, resulting from the decomposition of iodide of potassium, receives luminous impressions. A collodion which contains only this iodide is certainly one of the slowest kind; but it possesses special properties which may be advantageously studied.

Let us first mention the property of yielding pictures having great density in the high lights—a property which renders it especially suited to the reproduction of old engravings, in which the paper, which has become yellow through age, acts but feebly on the sensitive film—and in general to all those subjects which acquire marked contrasts in the negative, to the exclusion always of the reproduction of animated objects by reason of the slowness of which we are now speaking.

Another property of the collodion prepared with iodide of potassium is an extreme delicacy, which delicacy is proportionate to the rate at which the silver is precipitated during the process of development. This second property recommends the collodion so prepared for the production of small negatives intended for subsequent enlargement.

I propose to return to this subject, and to examine in detail the molecular condition of the reduced silver in negatives, with special attention to the processes and the preparations employed. These researches will, I think, possess considerable interest in connexion with the solution of the problem of enlargement.

Iodide of cadmium possesses photographic properties which are much opposed to the preceding iodide in relation to its rapidity of action; for the iodide of silver which it forms is one of the readiest to receive the luminous impression. But, on the other hand, it possesses the serious defect of yielding foggy pictures. This defect may be remedied by the addition of bromide of cadmium; but a still more effectual means of avoiding the foggy effect without altering the sensibility is to add a few drops of chloride of iodine, or a very small portion (about one or two per cent.) of chloride of zinc.* Without the addition of bromide this collodion, although possessing an unusual degree of sensibility, will have the defect of being insensible to the red, yellow, and green rays of the spectrum.

I must now speak of the *iodide of ammonium.* This iodide possesses such mixed qualities that it will yield a very good collodion when employed alone, or better with a slight addition of bromide of ammonium. Notwithstanding that this collodion is not so sensitive as that produced by iodide of cadmium, it is preferable to the latter on account of the artistic perfection of the images which it yields.†

I ought not to omit mentioning, however, one of its great defects, which consists in the facility with which it produces spots in the sensitive film at the moment of immersion in the sensitising bath.

Several experiments on this subject have proved to me that this effect is caused by the rapidity with which iodide of ammonium is decomposed into iodide of silver at the moment of immersion, by which means the liquid veins of the nitrate of silver bath in motion imprint themselves upon the plate. It is especially that part of the film nearest the edge of the dish which becomes spotted in this manner, which may be accounted for by the fact that the veins of the liquid repelled from the plate become broken on contact with the edges of the dish. The result is an inequality of action upon the iodide, which becomes reproduced upon the film by reason of the readiness with which the iodide is decomposed under the influence of the nitrate of silver. The natural inference from these facts is that this effect might be diminished by the employment of a vertical bath, especially if the plate be gently immersed in the bath. Experience confirms this opinion.

The same spots are produced also when the collodion contains a marked quantity of free iodine.

Finally, the same effect is produced when the collodion contains a too large proportion of iodides, especially if the nitrate of silver bath be strong and new. These phenomena always depend on the relative qualities of pyroxyline, ether, and alcohol contained in the collodion.

The three iodides which we have examined are nearly the only ones which are employed in the preparation of collodion for the wet process. Iodide of iron and iodide of zinc are sometimes introduced.‡

* The use of a very acid bath will also produce this result.

† I ought to mention here a remarkable coincidence which exists between the sensibility of the three salts now under consideration and their solubility in alcohol, the least sensitive iodide of potassium being also the least soluble in this liquid, while the iodide of cadimum, the most sensitive, dissolves in alcohol with remarkable facility.

‡ I cannot here enter into an examination of the iodides of organic bases nor of the iodides of other metals of the first section lately brought into use.

Iodide of iron does not seem to me to be an advantageous iodide for the preparation of collodion. A great deal has been said about its rapidity, but, for myself, I must say that I have not observed it to be remarkably sensitive, at least not as indicated by M. Eugene Sahler, when preparing this iodide in the collodion itself; but sundry experiments induce me to suppose that the same result may be obtained by other iodides in the same condition.

I will say only a few words on the *iodide of zinc*. Its properties are very much allied to those of iodide of cadmium. It has not seemed to me advantageous to use it alone, but I have obtained very good collodions by the use of this iodide in conjunction with others.

It remains now, before treating of the different bromides, to examine the action of free *iodine* in collodion. A well-established property of this substance is the power which it possesses of preventing fogging. A colourless collodion—that is to say, containing no free iodine, and sensitised in a neutral nitrate of silver bath—always yields foggy pictures. In order to remove this effect it is necessary to acidify the bath, or to add free iodine to the collodion, which indirectly produces the same result.

In this case, also, chloride of iodine will be found very useful, since at the moment of sensitising it produces chloride and iodide of silver, and sets free a certain quantity of nitric acid in the film.

A number of experiments have convinced me that, when a variety of iodides are introduced into collodion, the properties of the mixture do not accord with the properties of each iodide taken separately. For instance, the iodide of potassium—the slowness of which, when employed alone, is well known—appears to me, on the contrary, to increase sensibility when employed in conjunction with the iodides of ammonium and cadmium. I propose to indicate certain general rules which may serve as guides in the preparation of a good photographic iodising liquor. These rules are deduced from observation enunciated below; and, while leaving the operator free to choose which iodide shall predominate, they will serve as a basis, and will indicate the modifications necessary to introduce into the formulæ to suit the variation of circumstances :—

1. The quantity of iodine contained in collodion (I mean by this not only free iodine, but also that which exists in the iodides employed) should be in the proportion of one per cent. at least.

2. It will be found advantageous to employ in ordinary cases the iodides of potassium, ammonium, and cadmium together.

3. When it is desired to obtain the maximum of sensibility, care should be taken that the collodion contain no more than a trace of free iodine.

4. If the collodion film become spotted during the sensitising process, while its opaline appearance indicates that it does not contain an excess of iodiser, the defect should be attributed to too great an excess of free iodine; but, if the colour of the collodion has not passed beyond a yellowish orange, this effect cannot be attributed to anything else than to too great a quantity of iodide of ammonium in proportion to the other iodides.

5. Finally, if the collodion fog, iodine or chloride of iodine should be added until it acquire a yellowish orange tint (I would recommend in this place that the photographer should supply himself with an alcoholic solution of iodine, in order that by simple agitation he can judge immediately if the proper tint be imparted by its addition).

I would now say a few words on the influence of the nitrate of silver bath on the phenomena above described.

A silver bath rigorously neutral always gives foggy pictures; and, in order to remove this fogging effect, it is necessary, as I have already said, to add thereto a small quantity of acid.* Nitric or acetic acids may be employed, but I prefer the first to the second, on account of the acetate of silver which results from the use of the latter, and which dissolves at first in the bath, but after a prolonged use is precipitated by the iodide of silver, with which the bath saturates itself more and more. The acetate then remains suspended in the bath in the form of minute crystals, the unpleasant action of which on the sensitive film is well known and easily recognised, since the picture becomes literally covered with minute holes.

The use of nitric acid is not attended by this inconvenience; but it must be added to the bath with great caution on account of its energetic acid properties (one drop is generally sufficient for a pint and a-half of nitrate bath).

There is another acid, the action of which on the nitrate of silver bath seems to have escaped observation (many experiments have however, satisfied me of the advantage to be derived from its use): I allude to hypo-nitrous acid. A nitrate bath, to which has been added nitric acid charged with nitrogenous compounds, seemed to me to possess the property of giving great density in the dark parts of the negative, while the clearer portions were free from any fogging effect; but what appeared to me more remarkable than this was that the sensibility, so far from being diminished, was rather augmented under these circumstances. I have not been always able to corroborate this fact, not having experimented sufficiently; but I would direct the attention of photographers thereto, in order that they may verify the results which ought to be obtained by this body, especially in its application to instantaneous photography.

I will not occupy space by describing the well-known means employed to neutralise a too acid bath. I will content myself by simply condemning the use of ammonia in such a case. The neutralising action of this body being too intense, frequently gives rise to those accidents which result from the use of an alkaline bath. Carbonate of soda or carbonate of lime are, I think, the bodies to which we should give the preference under these circumstances.

It only remains for me now to speak of the action of bromides.

It is known that the bromide of silver is, compared to the iodide of that metal, less sensible to those colours which are least refrangible, such as the yellow, red, &c. It is principally on this account that the bromides are employed in collodion.

The *bromides of ammonium and cadmium* are those which seem to me to enjoy this property in the highest degree.

The *bromide of potassium* communicates to collodion a degree of delicacy similar to that which is produced by the iodide of that metal, without at the same time diminishing its sensibility.

The proportion of bromide which seems to me most suitable in the wet collodion process is one grain for each four of iodide.

Too much bromide will give rise to a superficial white fogging, which deprives the print of all vigour.

I now conclude these researches. A great deal still remains to be said on these matters, especially with reference to the influence which the progressive saturation of the nitrate bath by iodide of silver has upon the alterations which time produces in the collodion, &c. I propose to make these the subject of a second series of labours, which I shall have the honour of laying before the Society, should it deem them worthy of attention.

* The nitrate of silver of commerce (crystallised) almost always contains sufficient acid to preclude the necessity of adding any to it.

ON PHOTO-MICROGRAPHY.*

(Or the Delineation of Microscopic Objects by Photography.)

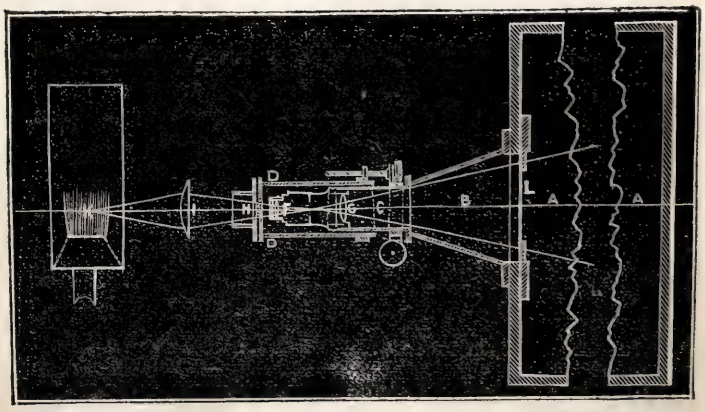
By JOHN PARRY.

HAVING been requested by many members of this Society to describe the method I employ for obtaining the micro-photographs I have from time to time brought to the meetings, I will now endeavour to meet their wishes.

First, I must say that I do not profess to introduce any particular novelty. All those engaged in these pursuits with whom I have had means of communication, and others who have described their methods in the Journals, adopt nearly the same means; yet there are little matters of detail which cannot well be explained without reference to the apparatus.

The camera I use differs but little from an ordinary one, a microscopic power being adopted instead of the usual lens.

I think it will be best, first to describe the instrument by the aid of the diagram, and afterwards I will take it asunder and explain it in detail.



* Read at a Meeting of the Manchester Photographic Society, February 5th, 1862.

A is the body of a camera: one that could be elongated—say eighteen or twenty inches—would be all the better. To this is attached a conical brass connecting piece B, on to which screws a tube C, carrying the power F, and also another achromatic lens of longer focus G inside. Sliding outside this tube is another, D, which carries the object H, and is moved in rough or fine adjustment quite independently of the tube C containing the lens. To accomplish this there is a loose collar having a clip screw underneath, and an adjusting screw working in a nut soldered to the outer tube. In front, the outer tube has a perforated plate of brass soldered to it, and in front of this is another similar plate held to the former one by two India-rubber bands, which thus clip the object H, and hold it in position. Until I adopted the above arrangement I had great difficulty in placing and keeping the object in position. I find it very convenient, as the object may be moved about in any direction, and afterwards left steady in its place. I is the condenser. The one I use is a plano-convex lens of about 1½ inches focus, the convenient working distance of which I find to be about one inch from the object, and from four to five inches from the light, K—in this case an Argand gas-burner.

I improve the field and get much better definition by placing a stop or diaphragm between the two powers or lenses at N; but of course this shuts out a large portion of light, which, in some cases, is very objectionable. I also find it convenient to place a stop in the body of the camera, and which stop is very easily and conveniently changed at the back of the instrument.

In working instruments of this description the most important thing to attend to is the light. I have usually taken it up in the winter season, and not having the apparatus for producing the oxyhydrogen or oxycalcium light, have had to content myself with the best light I could get from a good Argand gas-burner. However, I have tried an Argand paraffin lamp, and am of opinion there is something in the light from paraffin much better for this purpose than gas.

I have already said that the adjustments of the tubes carrying the lens and the object are quite independent of each other, and so they must be to obtain the best effect. First, the light must be so adjusted as to get the best possible effect on the screen before the object is put into the clips, and, afterwards, the adjustment of the focus for the object is accomplished without disturbing the arrangement previously made for the light.

A very convenient mode of illuminating objects in the day-time is by the use of a concave mirror, and with it to use the light from a white cloud, which will be found quite strong enough for most objects. Solar light may be used in the same way; but, as it will require constant adjustment and great care, I have rarely made use of it.

The lens or power I find most useful consists of a compound achromatic arrangement by Powell, of one inch focal length, combined with an achromatic lens of four and a-half inches focus: this latter is one of Ross's stereoscopic lenses. The two combined produce a much flatter field than the single combination. I do not use the eye-piece of the microscope.

The photographs are taken with collodion, and usually developed with iron and pyrogallic acid, and afterwards strengthened with bichloride of mercury.

Some objects are very easily managed, whilst others of a similar class are most difficult; for instance, many sections of wood are too transparent, especially if mounted in balsam, and only to be photographed by a peculiar arrangement of the light; others are so strong in colouring matter that it would require all the light that could be brought to bear upon them to bring out the details. Sections of fossil wood are in general easily taken, whilst sections of coal fossils are amongst the most difficult I have had to contend with, in consequence of the great amount of bituminous matter contained in them. Such objects as the trachea of the silk-worm are better taken with artificial light considerably stopped down.

The average time will be—for gas light, ten to twelve minutes; for daylight, three to five minutes; and for solar light, five to ten seconds. The coal fossils to which I have alluded took from twenty minutes to half-an-hour by gas-light.

I omitted to state that I use a flat table instead of the camera stand, placing the camera or condenser, and light or reflector in line.

One difficulty we have to contend with is that all substances, however thin they may be, have two surfaces, and those surfaces are rarely if ever alike: we can only focus the surface nearest the lens, and almost invariably the other interferes with the definition on the ground-glass.

In adjusting I always use a lens about an inch focus, contained in a tube of the same length, so that when placed on the ground-glass it is in position for securing an image in distinct vision on the other side of the ground-glass. It is absolutely necessary to use a lens, as it is quite impossible to adjust with sufficient accuracy with the unassisted sight. Indeed we require something better than the ordinary ground-glass to receive the image, but I have not yet succeeded in that. A washed and dried collodion film is the next best, but it again is too transparent.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

BROMIDE OF POTASSIUM.

Synonymes.—Hydrobromate potash. Fr. Bromure de potassium. Ger. Brom. Kalium.

Composition.—K. Br.

Equivalent.—119.

Preparation.—There are three or four methods by which this very important salt may be prepared: they are, however, so exactly similar in their details to the methods described at pages 232 and 233, vol. viii., for the preparation of Iodide of Potassium, that it will be unnecessary to do more in this place than merely mention the materials employed. 1. A solution of bromide of iron (obtained as directed at page 233, vol. viii., only substituting bromine for iodine) is accurately decomposed with carbonate of potash: the mixture is boiled, filtered, evaporated, and set aside to crystallise. 2. Hydrobromic acid is saturated with potash and evaporated. 3. Bromine is dissolved in solution of potash until the liquid becomes permanently coloured: the solution is then evaporated to dryness, the residue heated to redness and redissolved in water, the liquid neutralised with hydrobromic acid, and evaporated again. Or 4. Sulphuretted hydrogen gas is passed in excess through the solution of bromine in potash obtained in method 3, so as to convert the bromate of potash into hydrobromate: the excess of sulphuretted hydrogen is expelled by heat, the solution filtered from sulphur, and evaporated to a small bulk to crystallise, any excess of hydrobromic acid being neutralised with potash or of potash by hydrobromic acid.

Properties.—Bromide of potassium crystallises from its aqueous solution in brilliant cubes, which are sometimes elongated into prisms or reduced to a tabular form. Its specific gravity is 2·4: it is white and fusible, readily soluble in water with production of cold, slightly soluble in alcohol. Treatment of the dry salt with sulphuric acid causes the liberation of the red fumes of bromine.

Uses.—Bromide of potassium is employed for the purpose of producing by double decomposition a deposit of bromide of silver, which is precipitated in conjunction with iodide of silver, when the prepared surface which it is intended to expose to light is immersed in the sensitising bath of nitrate of silver. There is a great want of harmony in the opinions held by experienced photographers as to the usefulness of this salt. It has been supposed to increase the sensibility of the film and the density of the image, while the detail in the *foliage* of a landscape has been considered more perfectly rendered when it is introduced into the paper or collodion. This conclusion, however, seems to have been arrived at without due consideration of the attendant circumstances, since more carefully conducted experiments tend rather to prove that, while greater strength is given to the image, there is in fact a diminution of sensitiveness; and it is probably this latter property belonging to the bromide of silver (resulting from the introduction of bromide of potassium into the film) which, by lengthening the exposure, has produced a more efficient action of the light upon the iodide of silver with which it is associated, and thus has given rise to the opinion that bromide of potassium is more suitable for foliage than iodide alone.

Impurities.—Bromide of potassium may occasionally be contaminated with iodide of potassium, chloride of potassium, sulphate of potash, carbonate of potash, and bromate of potash. The iodide of potassium would arise either from intentional sophistication or from the original bromine having contained iodine. The chloride and sulphate of potassium have their source in the carbonate of potash used in the manufacture: the bromate results from inadequate care in the making of the salt, and ought not to occur. The following are the appropriate

Tests.—If the sample under examination contain iodine it will be readily indicated by the characteristic blue colour which will be produced on the addition of starch to a portion of the salt which has been previously treated with sulphuric acid. The detection of chlorides in combination with bromides, however, is by no means so easy, and requires a more accurate and quantitative method of proceeding. It is as follows:—100 grains of the salt are dis-

solved in four ounces of water, and decomposed with excess of nitrate of silver: the precipitate produced is washed, dried, and weighed. If the salt under examination be pure the weight of the precipitate will be 158·8 grains; but if chloride of potassium be present the weight will exceed this amount by about 3·3 grains for each ten per cent. of the chloride. Evidence of the presence of sulphate of potassium may be obtained by the addition of chloride of barium to a solution of the salt, when a white precipitate will be produced if the specimen under examination contain a soluble sulphate. Carbonate of potassium may be assumed to be present if the salt become very damp after exposure for a short time to the air, especially if, in addition to this, a solution of the salt, in pure distilled water, should become milky on the addition of lime water. The presence of bromate of potassium may be inferred if a known weight of the *dry* salt be found to lose weight after fusion.

Effect of Internal Administration.—No case of poisoning recorded. On animals it acts by producing convulsions, congestion of the lungs, &c. In doses of from three grains to ten grains it acts on man as a stimulant, alterative and deobstruent.

Antidote—or Treatment—Promotion of vomiting, and the exhibition of albuminous and mucilaginous drinks, such as eggs, milk, linseed tea, &c.—TAYLOR.

STEREOGRAPHS.

Scenes on the River Thames—Views of Vessels of the Channel Fleet—Illustrations of Scottish Scenery.

Photographed by GEORGE WILSON, *Aberdeen.*

IT is with much satisfaction that we find Mr. Wilson recording some of the picturesque effects observable upon the surface of the metropolitan river; for, notwithstanding it has been spoken of disparagingly as "a huge unquiet cesspool," there are phases of its existence which are well worth the study of both the poet and the painter. Although those who are familiar with the aspect of "Old Father Thames," and who daily scan his features, might at the first impulse be inclined to say with regard to them—"One day telleth another, and one night certifieth another,"—such an idea would be dissipated in a moment on recalling to memory how different is the appearance presented at the present day to what it used to be some quarter of a century ago. Then there were but few river steamers, and scarcely a solitary sea-going one, to stir up the thick deposit of mud at the river's bottom by their constant movement. In those days it was not only possible, but also a common amusement with young men of scarcely any nautical experience, to take a boat at "Searle's" for an hour or two, and row about between Vauxhall and London Bridges, undeterred by any fear of danger, except, perhaps, of a "capsize" in "shooting" one of the arches of old Blackfriars Bridge when the tide was strong. Now, how different! He would be looked upon as a bold man who would do such a thing, and his want of taste would excite no small astonishment; for, truly, a blind man wandering about the road in Cheapside would scarcely be more unsafe, and it would be a strange fancy indeed that could enjoy the unsavoury odour arising from these waters on a July afternoon.

Still, as we have said, there are many glimpses of the picturesque to be had, if taken at the right place and time. Who, for instance, can view without enthusiasm old GREENWICH HOSPITAL, with all its romantic associations, and regard otherwise than with satisfaction the noble purpose to which it is now devoted. Mr. Wilson gives us a pretty view of it in No. 326, with a brig in full sail up the river, the masts and sails of which break the monotony of the roof line to the right, while the two domes of the building perform a similar office for the corresponding parts on the left.

THE THAMES AT GREENWICH (No. 329) exhibits a scene familiar to those who frequent its banks. The tide is about a quarter flood: on the farther shore are vessels of several kinds—boats, barges, and brigs—lying high and dry; a factory on the left, with a jet of steam from the busy engine showing a white streak against the whitish sky; the rounded tops of some elm trees on the other side of the marsh peep above the bank; in the centre of the stream a brigantine is being towed up by a tug-boat, from the funnel of which a cloud of white steam is "blowing off,"—the man at the wheel being distinctly visible amidships, which is his usual place on board these vessels; on the right, a light boat with a spritsail is scudding across the stream; on the left is a solitary rower making the best of his way to the near shore; between the two is a boat quietly drifting, its occupant standing up and watching the little sailing craft already mentioned; while in the immediate foreground is an empty lighter, only just afloat, which the man at the head is struggling to get into the stream by pushing with the oar against the bottom. All the parts of this subject are capitally balanced and well contrasted: the broken reflection of the barge forms a capital foil to the crisp outline of the craft itself.

IN THE THAMES AT GREENWICH (No. 331) we have an ordinary sailing barge proceeding up the river just in front of "The Crown and Sceptre" tavern, of whitebait renown, with an undulating background of the trees in Greenwich Park. The tremulous ripple on the water is admirably pourtrayed, and the vessel itself is none the less picturesque for being old and somewhat weather-beaten, with here and there a patch on the sails, and two or three men on deck, one of them evidently on his way towards the stern of the vessel.

Nos. 332 and 334 are also both capital slides and full of life—the former being especially harmonious and delicate in gradation of tone.

DROPPING DOWN WITH THE TIDE (No. 330) is the picture of a brig, fully laden, just starting on her voyage, with her jib and lower foresails having been cast loose hanging in festoons, and a couple of sailors in the foretop in the act of unfurling the topsail—all bespeaking the immediate preparation for speedy flight; while behind, and visible across her bows is a sloop with every rag of canvas that she can show set and bulging with the force of the wind. Here again the harmony of contrast is most effective.

In 327 and 328 we have BARGES COMING UP WITH THE TIDE: both are good, but the former particularly so—the reflection of light from the water, with its dimpled surface, throwing up vividly the dark sails of the vessels and the houses in shadow on the opposite bank.

Amongst the illustrations of the Channel Fleet are three of H.M.S. "REVENGE" that are worthy of especial notice—that numbered simply 318 being the most perfect as a picture. The *Revenge* is the flag-ship, of 800 horse-power, and mounting 91 guns. The long hull and tall masts, with the tracery of rigging, are well displayed by a background consisting of a bank of snowy, rounded masses of clouds. The low hills on the shore are crowded and studded with numerous dwellings, and the rapid movement of the waters in a steady stream is distinctly apparent. In that marked 318c the point of view is from a different spot; and though the background of clouds is wanting, the black smoke from the chimney of the floating bridge partly obscures the masts and rigging in a very picturesque manner. In other slides we have "THE ROYAL ADELAIDE," "CONQUEROR," and "CENTURION."

Amongst the Scottish scenes the first we come to is one of those peculiarly beautiful combinations of clouds and water for which Mr. Wilson is so famous. The one before us is LOCH-IN-DARB, MORAYSHIRE (No. 342); and though in a similar style to those formerly produced of the Loch of Park, it is superior to the latter in execution and equally fine in selection of subject.

BALMORAL CASTLE, *from* CRAIG-AN-GOWAN (No. 12), is the best illustration of our Sovereign's Highland home that we have yet seen, and reveals what no other one has hitherto done—the charm of its situation—located as it is in a wooded but elevated valley, with a pleasing view extending over many miles of moorland scenery.

LOCH AVON, BANFFSHIRE (No. 337), is a singularly wild and lonely spot, more curious than beautiful.

LOCH INSCH (No. 356) is seen from under the overhanging branches of some birch trees. The slight haze from the water veiling the distant hills is truthfully artistic; but this otherwise fine slide is somewhat marred by the darkness of the foreground—apparently a hay field—which has clearly not received a sufficient amount of exposure.

THE WOLF OF BADENOCH'S CASTLE, OR LOCH-AN-EILAN, is as singular as it is beautiful. The so-called castle is a fragmentary ruin of an edifice built in the midst of a small lake, and is seen from the shore through an opening between the stems of a cluster of silver-birch trees, more of them being visible along the opposite shore of the lake: the distance is closed in by a range of low hills which tend to add an atmospheric attraction to the composition, the contrast between the near and distant ones being very marked.

CRAIGELLACHIE BRIDGE, ON THE SPEY (No. 349), is a scene thoroughly Scotch. The precipitous rugged rock, clothed with a thick plantation of Scotch firs, is washed at its base by the waters of the Spey, across which is thrown a light iron bridge. In the foreground is a clump of trees, amongst which the graceful larch is conspicuons.

Still more national in character, and far more beautiful, are three which we have reserved for a closing notice of this series. PINES IN THE FOREST OF ROTHIEMURCHUS, Strathspey (No. 353), is the title of a slide of the highest artistic as well as illustrative value. The scene is a gorge in the mountain side, where a gap has been made by the removal of some of the trees for their timber, the lower part of the stems of many others denuded of branches prior to their becoming a prey to the woodman's axe, the rough and tangled roots clinging in many places to the bare rocks, with scanty soil stored in the crevices, and here and there clothed with

patches of fern, while across the tops of the trees the feathery masses of thousands more are seen clinging to the opposite bank of the gorge, clothed in a veil of moist atmosphere.

The "Lion's Face" Rock, Invercauld, Braemar (No. 48), is equally beautiful with the preceding, but more delicate. At the base of a rounded pillar-like rock is a dense plantation of young fir trees of different kinds, like a mass of green feathers: on the right and left are two firs of sturdier growth and differing varieties; and so perfect is the delineation of the whole, that not only would a botanist find no difficulty in naming them, but the truthfulness of aspect is so great that it is only when the slide is taken out of the stereoscope that one is satisfied that the vivid green colour of the foliage really exists only in the imagination. A copy of this slide should be in every collection.

Another scene in Braemar, The Lum of Dee (No. 144A), is a gem of the first water: we intend no pun, although a mountain stream is a component part of the subject. The stream, though apparently not a turbulent one, has worn a deep channel in the angular rocks which form its bed in a zig-zag course, a handsome stone bridge is thrown across from bank to bank, a few small shrubs and several large pine trees are picturesquely disposed, and the whole scene is viewed between two enormous stems of those natives of the higher and colder regions. On a near projecting promontory of rock a boy is seated, by whose presence a good idea may be formed of the grand proportions of the scene.

A Scottish tour with Mr. Wilson is a treat of no ordinary character, possessing the advantage of being enjoyable at all seasons of the year; and certainly the interest is not diminished if physically you happen, to have gone over the ground before.

EASTWARD HO!

His Royal Highness the Prince of Wales, and suite, left town per S. E. Railway, on Thursday, the 6th inst., *en route* for the East. The Princess Alice accompanied His Royal Highness to the Station. The suite in attendance consists of Major-General the Hon. R. Bruce, Lieut-Colonel Keppel, and Major Teesdale, R. A., Equerries; the Hon. Robert Meade, Dr. Minter, the Rev. Dr. Stanley, and Mr. Francis Bedford. Though so short a time has elapsed since Mr. Bedford was specially summoned to Osborne (on the 22nd ult.) and requested to accompany His Royal Highness on this interesting tour, which will extend over a period of five months, Mr. Bedford leaves England provided with every requisite necessary for such an undertaking—duplicate sets of apparatus, a chemical "army of reserve," &c., &c., most of the heavy cases of which have been despatched per Peninsular and Oriental Company to Alexandria.

The bare mention of "Eastern travel" summons up a crowd of historic and sacred associations, which ever dwell around the far-famed and almost fabulous East. Horeb, Carmel, Etham, Nazareth, Bethlehem, the Jordan, the brook Kedron, and Hemnon's vale—names around which are entwined all the poetry of the Bible—and olive-crowned hills and citron groves—camels and caravanserais—picturesque groups and primitive tents—arid deserts and Bedouin Arabs—the Nile—the Sphynx—the Pyramids—until the mind whirls with teeming images and "thick-coming fancies."

That Mr. Bedford will come back richly laden from the gorgeous East it would be superfluous to express a hope or belief. It is a matter of congratulation that photography is—with this instance before us—not likely to languish for want of Royal Patronage. We can fairly say, with regard to the compliment to the profession in Mr. Bedford's person, "*palmam qui meruit ferat.*" S. T.

Foreign Correspondence.

Paris, February 11, 1861.

Our photographers are at present in some agitation in consequence of a judgment just pronounced by the court of *Police Correctionnelle* under the following circumstances:—MM. Mayer and Pierson had made a large number of portraits of political men. A Paris photographer, M. Thiébault, executed counterfeits of several of these portraits, printed them in the form of visiting cards, and disposed of them in the way of trade as if the *clichés* had been his own. MM. Mayer and Pierson prosecuted. Now the Tribunal of Commerce, which had to judge the matter, decided against the prosecutors, on the ground that the law concerning works of art and intellectual property is inapplicable to photography, "which cannot be ranked among the fine arts, but must be considered as an industrial art." The tribunal based its decision upon the fact that photographic operations depend upon the use, with more or less ability, of mechanical processes and apparatus; and it added that Daguerre, in giving the secret of his discovery to the public, had rendered it freely applicable by all. At the same time the judges recognised that MM. Mayer and Pierson, having sustained a real injury commercially, were entitled to sue M. Thiébault for damages before the civil court.

Thus photography is denied to be an art, and is placed on the same level as common industries; so that photographers like the Bissons, Baldus, Ferrier, and many others who, with great cost and fatigue, and often with serious peril, travel in the East, in Russia, to the summit of Mont Blanc, will be liable to see the pictures they have obtained with such effort piratically copied by the first comer without their being able to claim any redress from the law. In the eye of the law they are but clever workmen: talent, taste, and artistic feeling count for nothing in their labours. And, further, Daguerre having given publicity to his discovery, all the transformations and improvements which it has since undergone belong of right to the public. The law serving as a basis for this decision is of 1793. May we not ask whether the progress of modern discovery does not necessitate new laws? and, if a place among the fine arts be denied to photography, whether it has not at least a right to special legislation? Some measure in this sense would be but just, and it would spare our magistrates the painful embarrassment in which the present insufficiency of the code places them.

This important question was discussed at the last meeting of the Marseilles Photographic Society. That body intends taking some steps for the purpose of calling attention to the subject.

M. Reynaud, with whose studies on the iodide and the bromide of silver you are already acquainted, has communicated to me some observations relative to pyroxyline. He says that a powdery cotton, when too much attacked by the acid and salt employed in its preparation, gives a friable and uncohesive film which offers but a feeble resistance to the liquids it is treated with, and produces but indifferent images. It is not easy to determine at once whether any given cotton will produce such a result. To ascertain this, a small quantity should be dissolved in a mixture of alcohol and ether, in about the proportion of one gramme of pyroxyline to 20 cubic centimetres of alcohol and 40 of ether. After sufficient repose, so that the undissolved fibres may sink to the bottom, a small glass plate is covered with the collodion. The coating, when formed, is broken with the finger; and the aspect of fracture indicates the quality of the cotton. If the fracture shows a layer without cohesion, if the portion separated does not stick to the glass, the operator may be sure that the cotton is bad. If, on the contrary, the collodion is broken off with difficulty, and the separated portion adheres tightly to the glass—if, in a word, the layer has the appearance of a thin sheet of parchment—then the cotton possesses the requisite physical qualities.

It should also be carefully ascertained whether all trace of the acids employed in the preparation of the cotton has been washed away. For this purpose a little of the cotton is put into a phial with a certain quantity of water, and shaken up. A slip of litmus paper is introduced, and immediately reveals the presence of acid in the water, if any there be.

With the aid of litmus paper the operator should likewise ascertain that the ether is free from acid. The presence of alcohol in the ether, which is frequent, of course does but little harm; but the quantity of water therein contained is more important.

At the last meeting of the Marseilles Society a discussion arose with respect to the use of the tannin process. M. Meynier complained of his want of success in several trials of that process, at the same time that he had obtained very good results with a dry collodion, to which had been added twenty-five per cent. of benzole.

M. Leon Vidal, who has studied these methods thoroughly, remarked that tannin gives excellent results, but that it is necessary to take certain precautions. He mentioned rigorous cleanliness as indispensable. The defect that occurs the most often consists in numerous spots which proceed in general from drops of nitrate that have slipped in between the collodion and the glass. To avoid these spots M. Vidal, after he has well cleaned the glass, passes a pencil impregnated with gelatine along the borders. He lets the gelatine dry and then coats with the collodion. The layer is thus firmly fixed in a sort of framework, and the inconvenience referred to is avoided.

As I am speaking of M. Vidal, I will add that I have just seen several carbon pictures obtained by him with M. Poitevin's process, and which are perfectly successful, both for modelage and for harmony of tone. ERNEST LACAN.

WHERE TO GO WITH THE CAMERA IN YORKSHIRE.*

By C. Butterfield.

If a middle station of life is that which affords the best chance of contentment and happiness, I can imagine no happier being, nor one more to be envied, than a man of moderate means who can slip away for an occasional day from his business or profession, and can devote that day ardently, and from pure love of the art, to the pursuit of photography in the country. I need not dwell on the pleasure of being borne swiftly along, early on some fine spring or summer's morning, far away from the smoky town, the noise of whirring wheels, and the hustling of busy crowds. The young day looks bright and fresh, and the air is cool and refreshing, thanks to the rising dew still lingering on the hill-tops ere it is finally drawn away by the advancing sun. There is a charm in our favourite art that I think is found in no other. He who really loves it for its own sake, even if he have long passed the summit of the hill of life and is rapidly nearing the dark vale at the foot, will feel, on such a morning as I have described, that his pulse beats more healthily, his spirits are improved, and, what is worth all else besides, for a few short moments he will feel young again, his thoughts will revert to the days of his youth, he will forget the hard truths a life's experience has taught him, and the hollowness and selfishness of the world; youthful hopes and aspirations, long since trampled mercilessly down and lost, will return; the shadow will go back on the dial of life, and momentarily point to the time when all was sunshine, and no cloud had fallen to spoil the beauty of the opening scene. It is worth much to the man of business to experience this, and I know of nothing but photography that will cause him to do so. The artist tastes something of it, but his excursions are the business of his life, and must become, like all other business, monotonous.

There is no doubt that much of the photographer's pleasure arises from scenery, change, and pleasant associations. All these we may have on any ordinary excursion among the woods, fields, and picturesque lanes of this country; but the photographer has, in addition, an occupation, a labour of love. He does not stroll idly on, now plucking a flower, now beheading some tall plant with his stick after the manner of idle gentlemen in general: all very nice, doubtless, especially the feeling of being idle and irresponsible, and having nothing to do. But make the aforesaid stick-bearing individual into an enthusiastic photographer: give him a camera and "legs," and a box of dry plates, to carry in place of his stick, and you make an idle man into a happy one. We cannot be happy without something to do. Instead of our friend's eyes being confined to the lane in which he walks, or to the hedge bounding the next field, they will wander round the whole horizon, pry under every ivy-covered arch, and into every miniature glen and watercourse on his route. He will be constantly on the look-out for "bits." When he finds one his camera is planted in a twinkling, and, having commenced operations, he employs the only bit of idle time he has, while the plate is being exposed, in looking at and admiring the view he has chosen. The hours fly by like magic, and as his happy day draws to a close, and the fading light warns him to pack up for home, his only regret is that he had not time to expose a few more plates.

There are, I hope, few here who will not heartily sympathise in the little picture I have drawn, and who are not looking eagerly forward to the time when we may once more see the face of the country bright with the flowers and sunshine of spring.

It has been suggested that a series of papers should be read on the scenery of different parts of Yorkshire, especially bearing on those places most suited to a photographer, and I have been asked to contribute. I have chosen for the first subject a district which is, I believe, very little known. I am sorry this should be the case, as I *nowhere* know scenery more beautiful or more adapted to photography. I allude to the valley of the Ure, from the neighbourhood of Ripon northwards towards its source. I visited the district in the spring of 1857, and it is my purpose this evening to give you a short sketch of the route and the objects of photographic interest, in order that any one choosing the same ground for the coming summer may have some little idea as to what he may expect.

Starting from Bradford by the first train—as all photographers should—I booked first for Ripon. Most of you have been there, no doubt, and seen Studley Park and the noble Abbey of Fountains. I need not dwell on these, except to say that all those who have not been there ought to go at once, and those who have been there already will not, I am sure, need any aid from me to recall the place to their recollection. I may however mention, in passing, that the abbey was founded by Thruston, Archbishop of York, in 1132, and is perhaps the finest ruin in England. Leaving Ripon it is necessary to return for a time to those primitive and uncivilised conveyances called coaches, because as yet the village to which I am bound has escaped being run over by that screaming iron civiliser—a locomotive. There is something very strange now-a-days in travelling by coach, but very pleasant in fine weather, especially to a photographer. Giving him credit for an artist's eye, he is not sickened by the eternal straight line bounding his course: the road takes curious whims and fancies—now a dip into some pleasant hollow—now over the brow of a hill when common sense would have suggested going round the foot—now taking a sweep sideway for no purpose, apparently, unless to go as near as possible to that cool, fresh-looking little stream. I have a very foolish fancy about these old roads. I like to think that when they were first made there was not such an awful amount of science as at present—not so much squinting through weird-looking, spider-legged theodolites; not so much planning and staking, and working by line and rule, then as now. I like to fancy that roads were once footpaths, and that those paths were once green fields or pleasant woods. I can then understand how the want of a track, perhaps from one farm or homestead to another, should create that track, and how friendship or desire of companionship thus linked together these two places. No need of line and rule for this; and one sees at once why the path should diverge from the straight line if a pleasant stream diverted the first visitor's attention. I cannot account for the strange vagaries of some roads on any other principle.—To return, however. Half-way between Ripon and our first stage is Tanfield, a nice village vegetating on the river's bank. There is nothing much of photographic interest there excepting, perhaps, an old gateway called Tanfield Tower. It is the only remaining relic of a once princely mansion belonging to the Hanleys. The entrance gate is now fitted with a door in front and rear, and is used for a stable or for something equally as ignoble. *Sic transit*, &c.: now up, now down. From the gate, whence aforetime marched high-born ladies and gallant knights, now struts a dunghill cock, in his own estimation just as proud and stately.

Mounting the box-seat again, and travelling a few miles further, I came to my destination for the night—the village of Masham. (I beg pardon, I believe it is a market town.) Now as it was, I should say, nearly nine o'clock at night, I found almost every one in bed, even in the inn I stayed at. Luckily a moderately intelligent commercial traveller, who had wandered so far out of his course, was just as averse as myself to going to bed at nine o'clock, and so we managed to put off the evil hour to something like our usual time.

At no very great distance from Masham is Hackfall. I drove to the place next day. There is some little difficulty in obtaining permission to photograph it; but it is astonishing what a little oil, judiciously applied, and a silver key, will do. The officials were determined utterly to ignore my apparatus. The place is rather too artificial for my taste, still there are undoubtedly some very fine views to be obtained from occasional points: possibly, however, I may have been influenced to a certain extent by the fact that on the occasion of my visit the day was not so fine as I could have wished.

After leaving Hackfall I returned to Masham, and then passed successively through Bedale, Leyburn, and Wensley. At the latter place there is, or was, a fine old tree on the village green, which reminded me very forcibly of that beautiful picture—*An English Merry-making in the Olden Time.*

Passing onwards I came to the ancient castle of Bolton, which is in good condition, as far as the walls are concerned at least, but does not make a very good picture in consequence of the scarcity of trees in the neighhourhood. A view, however, should be, taken if for nothing else than the fact that the unfortunate Mary Queen of Scots was at one time confined there. I subsequently saw and lay on the very bed tradition says she once pressed. I must not omit to mention here the magnificent falls of the Ure. Some traveller—I forget who—calls these second only in beauty to the falls of the Nile: as a matter of course there is a great difference in the width. The falls of the Ure make a very beautiful picture for the stereoscope, especially when the water is low. The stratum consists of flat slabs of limestone, which appear to have been worn away into a kind of low terraces or steps: the water pours down these in succession with a force proportionate to its volume, which varies considerably at different times. It is, I believe, these very falls which Turner painted, and which painting has since been lithographed.

At the close of the day I arrived at a place called Nappa Hall. Here I took up my quarters for a few days, within easy distance of some of the wildest scenery in Yorkshire. One need never be at a loss here for views: every mountain pours into the valley some tributary rivulet, tumbling through wild-looking gorges and over precipitous ledges of limestone. There is Wærdraw Force, with its unbroken fall of 100 feet into a deep basin—the slow work of ages. One of the most beautiful pictures conceivable is produced here when the sun is shining in a proper direction. The force with which the column of water descends from the rock above creates a continual mist which, under the rays of the sun, exhibits a splendid iridescent appearance never to be forgotten if once seen: pity it cannot be photographed! Then there is Mill Gill Force, Whitfield Force, Gale Force, and a host of other nameless falls—a detailed description of all of which would be too wearisome.

Wensleydale, the valley through which the Ure winds its way towards Ripon, is little else than a series of views from one end to the other. Clumps of dark picturesque firs break and diversify the prospect, and contrast finely with the masses of limestone rock which continually crop out to the surface. The distance is distance indeed—clear and sharply defined. Miles and miles away the whole district is such as a photographer would delight in. Some of the views for large plates are worthy the camera of a Fenton. But, as it is very probable that he will not visit them, let those who live nearer essay to take them; and, even if they only partially succeed, I am sure they will never regret their "Tour in Wensleydale."

* Read at a Meeting of the Bradford Photographic Society, February 7, 1862.

Scraps and Fragments.

We understand that the Hon. Robert Meade (a son of the Earl of Clanwilliam, and nephew of the late Lord Herbert of Lea), who accompanies the Prince of Wales to the East, is also an amateur photographer, having been formerly a photographic pupil of Mr. S. Thompson.

Amateur Photographic Association.—When we last made mention of this body we notified that upwards of thirteen hundred negatives had been received by the Secretary. The reception is now closed for the current year, so far as the United Kingdom is concerned; but about three weeks' grace has been accorded to some of the more distant colonies, in order that some negatives now on their way to this country may not be excluded. At a meeting of the Committee the other day, an album containing seventeen hundred and fifty prints from negatives now in stock was laid upon the table. The selection of the subjects for prizes will necessarily consume some time; but the work will be proceeded with at once, and they will have been decided most probably within a month from the present time. All negatives (except those specified above) received after that date will be carried to the account of the ensuing year. Several important matters for the benefit of the members are under consideration, of which, when decided, due notice will be given.

American Photography at the International Exhibition.—Mr. Charles A. Seely says:—"The differences between the Commissioners of the London World's Fair and the photographers appear to have been satisfactorily compromised, and the photographic department of the Exhibition will now be attended to with the goodwill and support of all concerned. The photography of continental Europe will, no doubt, be fully represented, and the photographic exhibition will be extensive and brilliant. But the American department will probably be a vacancy. Congress has just refused to make appropriations for the encouragement of American exhibitors, and our photographers are supposed to be too much engrossed with the affairs at home to care anything about what is going on in Europe. Let us console ourselves with the fact that in former competitions we covered ourselves with glory, and with faith that in the future friendly contests we shall still retain our strength."

The first number of a new Belgian Photographic Journal appeared on the 15th ultimo, which is to be continued monthly. It is to be supported by several photographic amateurs of acknowledged repute, including the names of MM. D. Van Monckhoven, Professor Donny, H. Romberg, and others. The first number contains an introductory address, an extract from Mr. Hardwich's *Manual*, The jurors' report of the Photographic Section of the Belgian Exposition of 1861, and sundry small notes and memoranda. It is singular that in our last we had to draw attention to the appearance of another journal under *precisely the same title*, but emanating from another source, and announced to appear semi-monthly. We perceive that the two journals contain the same articles, somewhat verbally modified, with the exception that the jurors' report appears only in the journal for the 15th ultimo. This looks as if some change in the intentions of the promoters had occurred.

Fraunhofer's Lines.—Professor Zantedeschi, of Padua, in a communication addressed to our contemporary, *Le Moniteur Photographique*, says—in opposing an assertion of Dumas, to the effect that "Fraunhofer's spectrum has not, up to the present time, displayed any appreciable change, and that, consequently, the solar light itself has not undergone any alteration"—"I conclude that this Parisian chemist ignores the existence of my *mémoire*, published at Menaco in 1837, *De mutationibus quæ contingunt in spectro solare fixo*." He continues that, having recently made use of a camera with a constant aperture, a fixed position and distance, for a prism of flint glass of sixty degrees, and an immoveable plane of projection in order to make sure that the solar spectrum is absolutely fixed, he is thoroughly convinced that in Fraunhofer's spectrum there are both fixed and variable lines. He remarks:—"The moveability of the lines proved to me it was an indication of the influence of the medium through which the solar light passes, and of the variations to which bodies in a state of combustion are subject, and this led me naturally to suspect the modifications which arise not only in the solar photosphere, but also in the entire universe, and I at length concluded therefrom that the spectrum is a very perfect photoscope—that it is a faithful mirror which reflects the most delicate images of incandescent bodies, and the changes to which our planetary system is incessantly submitted."

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

Sentiment *(continued)*—The False and the Ugly *versus* the True and the Beautiful in Art—On the Various Kinds of Expression Peculiar to Various Scenes, &c.—How to Look at Nature.

"Talk of improving Nature when it *is* Nature—nonsense!"—*E. V. Ripingille.*

* * "Nature never did betray
The heart that loved her: 'tis her privilege,
Through all the years of this our life, to lead
From joy to joy; for she can so inform
The mind that is within us—so impress
With quietness and beauty—and so feed
With lofty thoughts, that neither evil tongues,
Rash judgments, nor the sneers of selfish men
Shall e'er prevail against us, or disturb
Our cheerful faith, that all which we behold
Is full of blessings."—*Wordsworth.*

"The picture which has the nobler and more numerous ideas, however awkwardly expressed, is a greater and a better picture than that which has the less noble and less numerous ideas, however beautifully expressed. No weight, nor mass, nor beauty of execution can outweigh one grain or fragment of thought! * * * The greatest picture is that which conveys to the mind of the spectator the greatest number of the greatest ideas.—*Ruskin.*

My dear Fellow-Student,—We have now reached a point from which we may consider that element of art which has greater claims than any of its predecessors upon our attention. The purpose of my last letter—purely introductory to this—was to show, by weighter evidence than my own, how truthfulness is not so inconsistent with the artist's loftier aspirations, as certain dogmatic oracles and indolent reasoners would have us imagine. Step by step we have progressed through our studies upon no other ground than this; it was the opening assertion of my first letter, and will be found as the sum and substance of all our studies in my last. I never did believe in that common opinion which exalts the false and unreal at the expense of the true and good, which says of that portrait which perpetuates the most amiable, or graceful, or tender feelings of the heart, or the fitful gleams of passion, it is false or flattered; and of that landscape which catches the expression of Nature's spiritual loveliness, it is ideal and fanciful. Sooth to say, we are not apt at any time in recognising Truth and Beauty, but are prone to give their names to the false and the ugly; thus we habitually call truths harsh, and stern, and cold, and hard, and beauties untrue and imaginary. The actual loveliness of Nature in her more spiritual aspects, shames that of the finest picture as much as the sun does a rushlight; and yet those who turn their blind eyes to the first without a single throb of pleasure, or the faintest, feeblest glow of vapid enthusiasm, grow frantic with delight when looking with distended optics upon the last, and glow like a furnace in their presence. If it were not so we should hear none of this strange nonsense about the ideal system of art which has been so serviceable to the opponents of art-photography, and which, thank goodness! seems, in its wearisome and childish old age, to be dying of death-blows given by stout and strong Mr. Ruskin, and the less eccentric and more able pens and pencils of his disciples. It seems to me that one of photography's noblest and most truly religious missions may be to herald the dawn of that day when Truth and Beauty shall be recognised as one and the same thing, according to the promise of our glorious creed—itself quite as full of beauty as it is overflowing with truth. When the art of which we are fellow-students was in its earliest infancy, we must all remember how the world was full of its praise, and how all the critics clapped their hands with delight at the aspect of hideous black and white patches of light and shade, crying aloud "How ugly! and how truthful!" Whereas now, when our journals and societies, our opticians, and chemists, and mechanics, and artists, have, by their united and harmonious efforts, made photographs something vastly more truthful and beautiful, the literature of the day is full of open and covert attacks, in which sarcasm and ridicule and shallow argument are all three engaged spitefully trying to prove that our darling art is both ugly and false. Heigho! it was ever so. All history teaches us the fact; and it forms the yet strong foundation-stones of many a grim and time-blackened old ruin which ought long since to have been swept from the memory of our race. This, however, is by the way, for we have now to consider the subject of pictorial sentiment or expression.

Pictures may be regarded as language, which is the vehicle of thought, and, as I have before said, may either convey the most uninteresting and commonplace ideas, burn with the fiery glow of eloquence, or melt into the soul-subduing sweetness of poetical beauty. Hugh Blair, speaking of eloquence, ridicules the use of

ornamental language when unsupported by sentiment, and compares it to the contriving of gestures and dresses for that which wants a body; and the same might be said of a picture which, having all the beauties it has been the purpose of my previous letters to develop and describe, yet lacked the great crowning charm of sentiment or thought. The sentiment of a picture may be unaffected and simple, profound and philosophical, elegant and graceful, or wild and terrible; but sentiment of some kind or another it must possess before it can be received by the fine art critic and patron as a work of real artistic merit. Sentiment has already received notice from us in connexion with the expression of light, air, and space, and with aërial perspective, and with harmony in the composition of lines and tones, and with tone, so that we have now chiefly to consider it in connexion with the selection and the treatment of our subject.

Suppose, then, with the purpose of producing a photographic painting or picture, we have selected the season, day, and hour for taking a certain picturesque view, have pitched our tent and erected our camera in a spot so carefully chosen that we have every chance of securing artistic *chiaroscuro* and sufficient contrast in the parts and planes to produce the proper effect of space, relief, &c., &c. Now our view must naturally have certain things more or less peculiar to it alone, and these must have their associated sentiments or thoughts. In the first place we perceive its geological peculiarities, with the vegetation common thereto, and trace out those features which, being the more prominent, are more strikingly expressive of such peculiarities. We next look out for the *thoughts* associated with these more prominent characteristics, and then we consider whether such are in harmony (do not lose sight of all I have already said upon this subject) with the *chiaroscuro*, the selected season, the hour, &c., &c., just as the case may chance to be. But the great sentiment of the whole may not reside in these natural features, but rather in some one or more due purely to accident, or to accessories associated with incidents of rustic life, or to atmospheric influences, &c. Yet we still consider the general aspect of the whole in relationship with the same, and choose such points of expression as may either prove most salient to the eye and mind, or are most susceptible of being made so by judicious treatment; always taking care that, in choosing the *leading* sentiment of our work, we are guided by its intellectual importance alone, and that when chosen it governs every other consideration more or less, so as to secure both subordination and harmony. Thus we may seek our picture-thoughts in those so peacefully suggested by the gentle undulation of sunny acclivities and shadowy hollows over which the ghostly images of the passing clouds seem to glide so smoothly on their way; in the flinty ridges, jagged peaks, and rocky fragments of scenes more desolate and grand; in the low lying marshy soil, rich with luxurious and varied vegetation amidst which the silver rivers gleamingly trace their serpent paths; or in the abruptly changing varieties of square lofty cliffs, with huge angular fissures and caverns, steep ascents, and deep dark narrow dells; or we may seek the leading idea in the broad gleam of sunlight which brings out prominently from the midst of an otherwise cloud-shadowed scene some scrap of picturesque beauty in the foreground and middle distance, or from the ghostly mystery which steals upward with the gathering mist, giving a wild, strange grandeur to the shadowy mountain forms, and filling our lonely minds with the awful immensity of that hazy, illimitable space into which all about us appears to be so swiftly and so silently disappearing; or again from the strange loveliness with which some gay and brilliant sun-irradiated scene will come to us through the quiet gloom of the grey-white vapour, as the wind lifts, one by one, the shadowy veils which concealed it, and bears them, in white floating masses or torn and fleecy fragments, up from the valleys along the sides of the sloping hills, and on over the mountain tops, to die away at length into the clear cool blue of early day in the bright unfathomable sky. In these and in the thousand and one such sentiments may we photographers find beauty without foregoing truth. Thus, in effects of light, effects of season, effects of air, effects of mist, effects of cloud, effects of the countless accidents of torrent, tempest, and passing rain, &c., or the equally numerous incidents of human interest, we may seek the thoughts or sentiments we need to make our sun-pictures worthy the most ambitious of our aspirations. Only let us seek Truth, and so perfect our appliances that there will be no difficulty in grasping the most refined and subtle of its expressions, and then our art shall speedily rise into the highest rank, and be readily welcomed as the worthy equal of the loftiest in some of their most ambitious reachings. For this end we are all needed—the theoretical, the practical, the experimental, the artistic, the scientific, and the mechanical; and there is so much promise in what we *have* done through combined action in societies, and in such pages as I am now writing for, that despair or despondency appears to me little short of criminal.

To continue: the sentiment is, to a certain extent, always influenced by our choice of the spot occupied by the camera or, in other words, the point of view. For instance, the grandeur and sublimity of a mountain would be more strikingly felt if viewed from the depths of a valley than if seen from an eminence; the depth of some wild glen would be far more impressive if we appeared to be gazing down into its sunless gloom from the height of some beetling cliff; and the low horizon, secured by a camera not occupying too lofty a perch, would best express a flat level country, or the vast plain of the desert-like ocean. Such considerations, however, will be too prominent in practice to need further elaboration here.

Throughout all nature—in every season of the year and in every hour of the day—we see the sentiment of each scene continually varying. The light and shade is full of expression, ranging "from grave to gay, from lively to severe:" spring, summer, autumn, and winter, each have their vast individual range of sentiments; and the misty exhalations of early morn and dewy eve, with their long sweeping shadows and low-lying streams of yellow or orange light, have, like the broad glare or grey cool brilliancy of mid-day, their own peculiar sentiments appealing to their own scale of mental associations and human feelings. To seek out these, in their more powerful manifestations, in spots, and at times powerfully imbued with harmonising and according qualities, is our chief business, then, as landscape photographers. To examine natural scenes with such views as these we need that cultivation of mind and eye which I have before urged the importance of, and such must be earnestly sought and carefully secured by all who would become photographic *artists* in something more than name. Thousands have toiled up mountains and hills without bearing away a single memory of aught beside the time occupied in the ascent, and the effect of the same upon their feet and legs; and, standing at length upon the topmost level of their cloud-piercing heights, have only thought of how far and how much they can see, without hearing one of those solemn though still small voices speaking to their nobler passions, or seeing those glorious ministers of love and beauty which lie before their mental eyes, pointing "through nature up to nature's God!" Just so thousands have gazed upon scenes of the most wondrous beauty, and seen nothing but a village called so-and-so, by such-and-such a river, near what's-the-name wood. Ah! how differently is it with the artist! Place Ruskin on that mountain height, and let him describe some of the thoughts and feelings which come thronging to the painter's mind eager to be embodied in his pictures, and thus brought powerfully home to the lazy minds and darkened vision of those who having ears do not hear, and having eyes do not see. With what deep feelings and glowing love Ruskin touches upon all *he* sees, telling us in his own simple and powerful and beautiful way—"Mountains are to the rest of the body of the earth what violent, muscular action is to the body of the man. The muscles and tendons of its anatomy are, in the mountains, brought out with fierce and convulsive energy, full of expression, passion, and strength: the plains and the lower hills are the repose and the effortless motion of the frame, when its muscles lie dormant and concealed beneath the lines of its beauty, yet ruling those lines in their every undulation. This, then, is the first grand principle of the truth of the earth. The spirit of the hills is action; that of the lowlands repose; and between these there are to be found every variety of motion and rest—from the inactive plain, sleeping like the firmament, with cities for stars, to the fiery peaks, which, with heaving bosoms and exulting limbs, with the clouds drifting like hair from their bright foreheads, lift up their Titan hands to heaven saying, 'I live for ever!'" No less beautifully does he describe the sunny slopes of the undulating hills, comparing the woods upon their gently swelling outlines to the bending plumage on the bosom of a bird; or revel in pictures of the wild and desolate Alpine scenes and those "pure and holy hills" that link the earth to heaven, and whose real living expressions are spoken of as fountains of feeling yet unopened and chords of harmony yet untouched by art. Again, how the angular outlines, sharp edges, eccentric fissures and markings or rounded water-worn aspect of the rocks, appeal to a crowd of according thoughts when seen in his glorious word-pictures, and how he dwells upon those monster crags and "walls of living rock, mighty surges of tempestuous earth, dim domes of heaven-girded snow, where the morning first strikes, and the sunset last lingers, and the

stars pause in their setting, and the tempest and the lightning have their habitation"—which seem to rise before us, awe-inspiring, God-adoring, as he speaks, and in their native, naked reality, laugh to scorn the wildest flight of the most powerful imagination of that poor little morsel of conceit who boasts so loudly of *improving nature!* Yours truly, ALFRED H. WALL.

Mr. Vernon Heath (of the firm of Murray and Heath, of Piccadilly, London) has retired from the business hitherto carried on by him, and intends devoting himself entirely to professional photography in landscape and portraiture, in both branches of which he has proved himself a proficient. We are informed that Mr. Heath's place will be filled by Mr. Charles Heisch, a gentleman whose name will be familiar to many of our readers as President of the Blackheath Photographic Society, and author of several important articles on photographic subjects. Mr. Heisch is also Professor of Chemistry in the Middlesex Hospital Medical College which office he will still retain.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held at King's College, on Tuesday, the 4th instant,—the Lord Chief Baron, Sir Frederick Pollock, President, occupied the chair.

The minutes of the last meeting were read and confirmed.

The President directed attention to, and recorded the thanks of the Society for, the following matters of interest placed before the meeting:—

Mr. Browning, Secretary of the Photographic Society of Dublin, exhibited some very interesting stereographs taken in Ireland.

Captain Allan Scott presented to the Society a numerous and valuable assortment of stereographs taken in India, representing natives of different castes and stations of life, each engaged in a characteristic operation: among the number were some excellent photographs of Indian scenery.

Mr. Thomas Clark Westfield, of High-house, Keston, Kent, presented to the Society a book containing six stereographs, illustrative of letter-press, describing the Japanese and some of their manners and customs. The photographs were well executed, especially those of the *Emperor's Palace* and *Two Japanese Ladies.*

Dr. Wright exhibited and described a new form of water-tight gutta-percha bath contrived by himself. The bath differed from the ordinary forms in being furnished with hinged bolts attached to its sides, which bolts slipped into slots cut into each end of the top piece or cover of the bath, so that when the nuts which were attached to the ends of the bolts were screwed down the top was maintained in the closest possible contact with the bath. The top of the bath when not in use as a cover admitted of being so placed as to act as a support to the bath while operating.

The Secretary of the Photographic Society of Scotland sent copies of six stereographs, illustrative of the application of photography to the delineation of various stages of disease.

A Member having asked if the Society were furnished with a suitable receptacle for such gifts as it had received that evening, the Secretary explained that the donations received from time to time by the Society were carefully preserved in a locker provided for the purpose in the hall of King's College.

The President requested the Secretary to read rule vii. of the Society, referring to the election of new members of Council and other officers.

When the Secretary had read the rule,

The President explained that the object thereof was merely to remind the members that the form required by rule vii. had been duly carried out [see The British Journal of Photography, vol. viii, page 446] by the public announcement of the names of those officers who would retire and the names of those proposed for election. That list had been openly exhibited at King's College for modification by any member who desired to do so, and in the interval which had elapsed since the 3rd of December, 1861, no desire for alteration had been expressed. In view of this fact, he (the President) was disposed to concur with the opinion entertained by the Secretary, which was, that it would be a useless formality to put the names of each and all of these gentlemen to the ballot. He (the President) knew of no greater improvement which had occurred during the last forty years than the omission of useless formalities in conducting the public business of the country. Speaking as a lawyer, he could say with considerable satisfaction that many forms which were once deemed imperatively necessary had recently been, so to speak, amputated from the proceedings with which they were once connected: many proclamations and formal announcements which were once regarded as essential were now entirely omitted. He need not, he felt sure, before such an assembly, enlarge on the value of time: he would simply remind them of the proverb—"*tempus ager meus.*" And in reference to the matter then before the meeting he (the President) thought that the Society would be only acting in accordance with the spirit of modern improvement if it at once declared the gentlemen named on the list unanimously elected, seeing that no other result was likely to follow the introduction of the ballot-box. He begged to propose, therefore, that the list be carried as the result of that evening's proceedings.

The President then took the sense of the meeting on the proposition, which was in favour of the election of the gentlemen named in the list.

The Secretary then read the

ANNUAL REPORT FOR 1862.

In submitting the ninth Report of the progress and prospects of the Photographic Society, the Council have good reason to look back with satisfaction to the past year's proceedings, and to anticipate an unusual success in the future.

The balance sheet herewith presented exhibits a far more satisfactory condition of the finances than has been shown for some years.

In 1858 the deficiency on closing the year's accounts amounted to £56. In 1859 it was £88; and in 1860, the large sum of £384. The balance sheet for the past year exhibits a marked improvement, in so far that the receipts of the year are slightly in excess of the expenditure. This result is the more gratifying, as it has been chiefly brought about by means which prove that the art and science of photography is becoming more appreciated by the public as its capability, its beauty, and advantages become better known and more clearly understood.

In the year 1858 the public Exhibition of Photographic works, held under the auspices of the Society, left a deficiency of upwards of £100. In 1859 the loss sustained was only trifling, but the Exhibition of 1860 showed a serious deficiency of £125.

Now it was highly important that the annual displays should be continued: so the arrangements of the past year's Exhibition, and its mangement, received particular care in order that every possible saving might be effected, and the high character of the Exhibition still maintained. The Council have much pleasure in now reporting that a profit of £36 was the result due to the increasing appreciation by the public of the beautiful works collected together.

The publication of the Journal also shows a small balance on the year's account. Although issued for the convenience and information of members of the Society, it has been accepted as a chief literary authority on photographic subjects; and this position it still maintains, notwithstanding the numerous photographic periodicals which have come into existence since its first establishment.

During the first year a most important matter unexpectedly claimed the attention and compelled the interference of the Council in order to vindicate the position of the members of the Society. It strongly proved how necessary it is that a central representative body, such as the London Photographic Society may rightly claim to be, should watch over and vigilantly guard the interests of the professor and the scientific position universally accorded to photography.

In the intended Exhibition about to be opened at Kensington it was proposed that the results of photography, and the apparatus by which these results are produced, should not be classed with the fine arts, but be included among mechanical contrivances, fitting in between horological instruments and ships' tackle. Against this proposition the Council entered an indignant protest, and their expostulation received the almost unanimous assent of photographers both in this country and on the continent.

By some confusion of ideas, it appears to have been considered by those who first proposed the objectionable arrangement that pictures taken by light were merely mechanical results, in so far that they were produced by the agency of the camera, and that therefore they should not be classed with pictures and other works of art. It seems to have been overlooked that such a definition must have banished these latter also into the limbo of mechanical products, as they are produced by means of the eye of the artist, and the human eye is simply the most perfect camera known, lens, diaphragm, focussing apparatus, sensitive plate and pictures, which, as Locke writes, "when drawn in our mind are laid in fading colours," and even high art cannot pretend to accomplish anything without an eye. On any other grounds, as the display of true artistic power, and appreciation of what constitutes a real picture, the proposition of the authorities was still more untenable, and the Council have much pleasure in stating that the impropriety of the proposed arrangement was at length admitted, and that a plan by which photographic works are accorded a position more suitable to their importance has been adopted; and the Council cannot refrain from here mentioning how deeply the Society is indebted to the President for his personal exertions and his invaluable advice and assistance in conducting this important matter to a satisfactory issue. On the settlement of the above difference, the Council willingly agreed to afford every possible assistance in the arrangement of the department, and at the request of the Royal Commissioners, two members of the Committee, the Earl of Caithness and Mr. Kater, together with Dr. Diamond, were appointed to advise them in their decisions as to the photographic department. The Council have, however, still to express their regret that the position assigned to their department in the building at Kensington is far from satisfactory. Every endeavour has been made to get this disadvantage remedied; but it would appear that no other space is at the disposal of the Commissioners, as they have expressed their wish to do all honour to Photography, and promised, under the new arrangement, to associate it as nearly as possible with the Fine Art department. The whole space appointed to English exhibitors for the display of photographic pictures is under 3,000 square feet, and that for apparatus and chemicals about 500 feet more.

The applications for space were so numerous that a very much larger extent could be easily filled; indeed, one person alone requested an allotment equivalent to six times the whole available amount.

It was hoped and anticipated throughout this country that the photographic results of all nations would be exhibited together; and the advantages afforded by such facilities for direct comparison are obvious. The objections to such an arrangement, it is stated, came from the heads of the foreign department: how far this was due to their wish to avoid the objectionable arrangement of their artistic contributions originally contemplated cannot now be known. It may be fairly assumed that photography will form one of the most interesting parts of the new Exhibition, especially as the one great object is to take stock

the progress made since the first gathering together of the results of human ill and industry in 1851.

In alluding to these wonderful structures there is one honoured name which ontaneously arises in the mind whenever and wherever they are mentioned. has often been said that the lamented death of the Prince is, at this time pecially, felt as a national affliction, on account of the great work now in ogress, which is so identified with his name. Yet, throughout the whole ne that the Prince Consort so nobly filled that high position, of which we)w recognise the greatness by sadly noticing how vast is the blank which his ss has left, his efforts were unceasing to advance and assist everything that as good and worthy, so that had that

"Sweet nature gilded by the gracious gleam
Of letters, dear to Science, dear to Art,"

en spared to us yet a little longer, it must still have seemed, whenever the tal summons came, that then his loss could least of all be borne.

During the past year there have been recorded no great discoveries in photo-aphy as a science, and comparatively few improvements in it as an art; but s progress has not been less marked than during former years, for it has now ntered on, and made great advance in, that most important phase in the evelopment of every art, by its *application to useful purposes*.

But a few years ago photographs were a scientific curiosity; now photography vais the electric telegraph or the railway in the multiple interests it subserves. he lawyer receives the photograph of a signature as evidence; the doctor exhibits ie results of his skill by photographs of the case before and after treatment; ie engineer judges of the progress of his works from daily scraps of paper hich the post brings him from the recording camera; and Government so onfides in the value of the results obtained by photographic aid, that attain-ent of the art is encouraged, and its practice profitably employed in all epartments where exactness in representation and reproduction is required. o great, indeed, is its utility now become that every improvement in the pro-ss, however trifling in itself, acquires importance by its side application.

To the Royal Society there is yearly apportioned a Government grant of oney to be expended in furthering scientific investigations for the benefit of ie country.

The Committee of the Photographic Society, pointing only to the practical sults hitherto attained under unfavourable circumstances, would venture to iggest that assistance should be granted by Government towards improve-ents in the processes of photography. It would serve to determine many ifficulties, and tend to increase the advantages now derived from the various mployments of the art in different departments of Government.

A yearly grant, if only a tithe of the money saved by substituting photo-raphs for the mechanical drawings formerly made in all ordnance, naval, and ther departments in the art, would assuredly more than repay the expenditure.

The avidity for small full length photographs has, during the last year, so emarkably increased, that this development of public taste appears almost orthy of historic note. And these little pictures, equally perfect and pleasing, indicate the correctness of the popular predilection in their favour. They ecall, not merely the features, but the attitude and habit of the sitter, and are ndeed "the abridgement of all that is pleasant in man."

As now produced they admirably illustrate how conducive to the pleasures f the many photography may be made, whilst equally valuable to the highest ntellectual investigators, or of recording the results of mechanical skill.

During the past year twenty-four new members have been elected, and it is nticipated that a still greater addition will accrue from those who have hitherto elonged to the societies which have ceased to exist.

The numbers of these have gradually diminished as the advantages of one entral and representative body have been recognised throughout the country.

The Committee trust that the confidence so generally expressed in the hotographic Society of London, as representing the interests of the art and rogress of this science, may be always maintained.

The SECRETARY, at the request of the President, read over the list published at p. 446, vol. viii., of this Journal, and, while doing so, incidentally nentioned that Mr. Bedford had been appointed to accompany H.R.H. he Prince of Wales for the purpose of superintending the photographic roceedings connected with the tour of his Royal Highness in the Holy Land.

The LORD CHIEF BARON thought it only right to say how much he felt honoured by his re-election to the office of President by the Society. He ould only say, in reference to the slight service he had rendered, and vhich they had been pleased to acknowledge, in connexion with the osition assigned to photography in the Exhibition of 1862, that when ie saw that resistance was required to what appeared an insult to photo-graphy he willingly placed at the disposal of the Society all the powers ie possessed, in the endeavour to persuade those in authority to modify heir proposed arrangements. The worthy President then, after an-nouncing the next meeting for the 4th of March, vacated the chair; but, n Mr. Durham reminding him that the Report had not been formally eceived or adopted, he resumed it for an instant, and asked the members f it were their pleasure that the Report should be adopted?

A few hands being held up, and no objection made, the resolution was declared carried without dissentients, and the meeting, in some little surprise, then adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held on Wednesday, the 5th instant,—Mr. Wardley in the chair.

Mr. PARRY read a paper *On Micro-Photography*. [See page 63.]

The CHAIRMAN said that he had been much gratified by the pleasure afforded to them by Mr. Parry that evening. The subject was one which he had always feared as involving the use of much complicated apparatus; but he now found that the pursuit they had heard described was one within the reach of all photographers—that it was simple in character and full of interest. The sensitiveness of the photographic process to be employed appeared to be very important; and he asked Mr. Parry whether he had tried the addition of iodide of iron to collodion?

Mr. PARRY replied that he had not.

Mr. NEVILLE said Mr. Parry's want of a good substitute for the ground-glass of the camera might be met by dabbing putty upon plain glass. If it were applied carefully, a surface of great delicacy could be obtained, much finer than any ground-glass he had seen, and the coating became perfectly hard.

The SECRETARY said that Mr. Cheetham, a friend of his, in working with the microscope had found that he obtained much finer definition by causing the light to pass through a prism before it reached the object, using certain of the coloured rays: for instance, he found that by aid of the green rays he could discover markings which were not seen at all before. Although this green light would not of course do for photographic purposes, it was possible that the violet rays might be employed with advantage for some objects.

Mr. NEVILLE thought that the only reason why these markings had appeared was that the eye was relieved by the green light.

The SECRETARY said that it would be recollected that Mr. Petschler had at one of their meetings spoken of a green shade for the dark room, stating that he could by its aid judge more correctly as to the quality of a negative. The use of a similar medium in the microscope might, he thought, act upon the same principle.

Mr. PARRY said that in his paper he had alluded to taking pictures by transmitted light only; but he intended this summer to work with reflected light, so as to take opaque objects. Some special arrangement for lighting up the subject would be necessary, and he sketched the plan he thought of adopting. He proposed to employ an annular reflector behind the lens glass so as to throw back the light which had been transmitted to it upon the object, adapting a central screen for stopping its passage in that direction. The lighting up of the object was the most difficult part of this application of micro-photography.

Mr. HOOPER said that a friend of his had shown him a very simple and efficient method of lighting up opaque objects in the microscope. He coiled a piece of platinum wire outside the lens, and then, by connecting it to a galvanic battery, brought it to a heat which emitted the required light.

Some objections having been made to this method, Mr. HOOPER said that, before the next meeting, he would endeavour to see his friend and get him to exhibit his apparatus.

Mr. PARRY observed, in reference to instruments for the purpose he had that evening brought before the meeting, that one great difficulty was to get the lens properly corrected for the chemical rays; but this could of course be readily done by experiment, just as they were once obliged to do with our ordinary photographic lenses.

Mr. M'LACHLAN said that the most simple way to deal with a lens that was not so corrected was to make a dark frame on purpose, which should afford the required variations from the ground-glass.

Mr. WARDLEY said that, in reference to photography generally, Mr. M'Lachlan's plan would not answer, because the same alteration would not correct a lens when the focus was much varied.

Mr. ROGERSON said that whatever variation took place was a matter of no practical importance. He had adopted the same plan as Mr. M'Lachlan, and had found it to answer the purpose.

The SECRETARY inquired whether any of the members had seen an advertisement issued by Mr. Grubb? It consisted of a copy of the first page of THE BRITISH JOURNAL OF PHOTOGRAPHY, and was, he thought, the finest thing of that character he had seen. It approached the original size, but the definition was excellent, and the lines perfectly square. The negative was, however, taken with a portrait lens which was very expensive.

Mr. WARDLEY had lately been much struck with the performance of a Dallmeyer lens: in copying the definition was quite marvellous. He had not tried it in the production of negatives which approached the dimensions of the original, but would, before the next meeting, take a copy of the full size.

After some further discussion on the relative value of different lenses votes of thanks to Mr. Parry and the Chairman closed the proceedings.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE third meeting of the sixth session of this Society was held in the Society's Hall, George-street, Edinburgh, on Tuesday evening last. The chair was occupied by Horatio Ross, Esq., Vice-President.

The first business transacted was the moving of an address of condolence to her Majesty on her recent bereavement; and, in introducing the subject,

The CHAIRMAN made some very excellent remarks. It was needless, he said, for him to dwell upon the value of the late illustrious Prince. With the exception of her Majesty herself, the nation could not have sustained a greater loss than it had done by the death of the Prince Consort. That Society, in particular, was called upon to express its feelings on such an occasion, as they all remembered that when they first met together with the object they had hitherto endeavoured to carry out with energy—that of promoting the art of photography—they were desirous of having a patron who, from his position, would confer honour and respect on the

Society. He (Mr. Ross) had been appointed to communicate the wishes of the Society in that respect, which he did through his Royal Highness's private secretary; and the Prince, in the kindest manner, and with the readiness he had ever evinced in doing anything which would further the advancement of the arts and sciences, at once consented to become their patron. When they first proposed to have an Exhibition, and were doubtful if they could ever organise one which would be worthy of the support of the public, he had again appealed to his Royal Highness, and asked him to encourage them by permitting some of his collection to be exhibited. He had responded by sending some of the best pictures he had in his possession, and he continued to do that until their progress had been such as to necessitate no further call from them upon his Royal Highness. They all felt his loss deeply, whether as a nation or as individuals; and it was the Society's first duty to move an expression of its sympathy with her Majesty on her loss.

Sheriff Moir then read a short address of condolence, which was unanimously approved of.

Award of Medals for the Best Pictures in the Exhibition.

The Chairman stated that he had this year again, with the assistance of Sheriff Moir and the Secretary, Mr. Adam, been requested to award the prizes for the best pictures in the Exhibition. This task they had found a very difficult one from the great number of fine pictures present; indeed he thought this was the best Exhibition they had yet had, not only in respect of portraits, but also of landscapes and of that new branch so largely represented in the Exhibition, *cartes de visite*.

It was not to be considered possible that their award would give satisfaction to all; for, as he had said, it was with great difficulty they could come to a conclusion in the matter from the number of excellent pictures exhibited: still, they had acted conscientiously and to the best of their ability.

In portraiture they had awarded the medal to Messrs. Hill and M'Glashon for their picture, *Portrait of Dr. Brown* and another gentleman (No. 295).

In landscapes they had again awarded a medal to Mr. Mudd: they considered his picture *On the Tay, at Dunkeld* (No. 54), the best landscape in the Exhibition.

The other medal—that for the best frame of *carte de visite* portraits—they had awarded to a gentleman who had also previously received a medal from the Society, Mr. H. P. Robinson.

In making these awards he must again inform them that they had acted to the best of their ability.

A communication by Sir David Brewster, on the subject of zincography, was then read by Mr. Kinnear, who stated that it was an extract from Sir David's article on the recent progress of photographic art in the current number of the *North British Review*. The extract was as follows:—

"One of the most valuable applications of photography is that of Sir Henry James, in 1855, to the reduction of the ordnance maps from the scale of 25 inches to the mile to six inches to the mile, which was required for the engraved county plans. In 1859 the accuracy of the plans thus reduced was called in question in Parliament by Sir Denham Norris; but a committee appointed by Government, and presided over by Sir Roderick Murchison, reported that the greatest deviation in any part of the plans from perfect accuracy does not amount to the 1-400th part of an inch, and that this small error is not cumulative. The committee also reported that this application of photography would, in the course of the survey, effect a saving of at least £32,000. The accuracy, indeed, obtained by this method of reduction is much greater than it could have been by any other process. It had one defect, however, which occasioned considerable expense. Before the reduced plans could be transferred either to the waxed surface of a copperplate or to stone or zinc plates, it was necessary to make tracings of them in ink—a process both tedious and expensive. Sir Henry James, therefore, introduced, in 1859, the chromo-carbon process, by which he was enabled to produce photographs which could be at once transferred either to copper, stone, or zinc; and as zinc was the material generally employed, he gave it the name of photozincography. We have now before us several beautiful specimens of this valuable process, which show its value in copying old deeds, and especially the finest line engravings, reproducing in the most perfect manner the lines in their darkest parts. At the Ordnance Survey Office, Sir Henry is now engaged in copying the original manuscript of *Domesday Book*, county by county, and also the folio edition of 1662 of the Plays of Shakespeare."

This communication was accompanied by the exhibition of several specimens of photozincography.

Mr. Taylor begged to hand round for inspection some specimens in a similar direction. Some of these, he said, were by Mr. Osborne, of Australia, and some by Mr. Ramage, of Edinburgh; and, from an examination of the whole, he thought they would be satisfied that those produced in Edinburgh were at least second to none of the others.

The Chairman remarked that they were indeed beautiful, and asked if Mr. Taylor could inform them how they had been done?

Mr. Taylor said that he believed Mr. Ramage had no immediate intention of divulging his process; but Mr. Osborne's process was as follows:—A sheet of paper was coated with gelatine and bichromate of potash, exposed under a negative to the action of light, and then blackened over with lithographic ink. When subjected to the action of water, those parts unacted upon by light allowed of the ink being removed from them; but where the light had acted, being rendered insoluble, retained the ink, and the picture was then ready for transferring to the stone, and impressions thrown off by the printer. The whole time occupied by Mr. Osborne, from receiving the map or plan to be reproduced to the actual passing through the lithographic press, he believed was four hours, and this included the photographic operation too.

Mr. T. B. Johnstone corroborated the remarks of the preceding speaker, and exhibited specimens showing the various stages of progression from the prepared paper to the impression in ink.

Sheriff Moir thought that, from the various specimens exhibited and the remarks made about photozincography and photolithography, that was a most important application of the art, and he should like if some member would read a paper on the subject at an early meeting, and bring before them all that was publicly known on the subject.

At the request of Sheriff Cay, seconded by Mr. Burnett, Mr. Taylor agreed to read a paper on photolithography, premising that it would only be a compendium of what was already published, without any original matter.

Professor Archer exhibited some specimens of Joubert's patent glass photographs, in connexion with which the following notice of them, by Sir David Brewster, was read. There was at the same time exhibited some specimens of M. Camersac's new process of photographic enamelling. The account of these was as follows:—

A very important branch of photography, hitherto partially studied, is now beginning to excite much interest, namely, the reproduction of photographs upon the surfaces of porcelain, glass, and other substances, into which they are burnt and permanently fixed.

M. Lafon de Camersac seems to have been the first person who practised this interesting application of photography. On the 11th of June, 1855, he communicated a paper to the Academy of Sciences, *On the Transformation of Heliographic Pictures into Indelible Paintings, Coloured and Fixed by the Processes of Ceramic Decoration;* and he exhibited to the Academy specimens formed in the oxides of copper, iron, and manganese, and in cobalt and gold, fixed by fusion in a muffle upon glass and enamel. Selecting for grounds either metals or subtances used for pottery, he employs vitrifiable compounds for tracing the image on them; and he operates on the images thus obtained by metallic salts, and those furnished by the resins. With pictures produced by the aid of collodion, albumen, gelatine, &c., he developes the image with nitrate of silver till the half-tints are overdone and disappear, and the deep shades are covered with a thick deposit having the appearance of a bas-relief. The proof being then placed in an enamelled muffle, the organic matters disappear under the action of a proper heat, and the fire cleans the image and restores all its delicacy. The heliographic image thus treated may receive any kind of colouring; may be transformed into gold and silver, as well as into blue or purple; and may even be burnt into porcelain with the furnace colours.

Having prosecuted for seven years the solution of the problem of the perfect fixation of the image, M. Camersac communicated to the French Photographic Society, in September, 1859, the general results at which he had arrived. On *tender porcelain, soft enamel,* and *delf ware,* he formed the image with metallic oxides, and fixed them by fire in the muffle. In *hard porcelain, biscuit, hard enamel, glass,* and *crystals,* the metallic oxides have their fluxes added to them; and on these different substances, whether white or tinted, he forms the image in gold or in silver with their fluxes added to them, and he fixes in the muffle. In *silver* he forms the image in gold, or in a combination of lead and silver. In *paper, parchment, gelatine, ivory, wood,* and *prepared cloths,* he forms the image with any colouring matter, and he fixes it with gum, gelatine, albumen, glue, oils, and varnishes.

A portrait of the Queen, and another of the late Prince Consort, were lately burnt in on enamel by M. Lafon de Camersac, and painted in colours burnt in by one of M. Claudet's artists. These pictures, which are excellent likenesses, were exhibited at the last Photographic Exhibition in London, and were much admired. In July, 1857, Mr. Tunny exhibited to the Photographic Society of Scotland pictures on glass, parian, and porcelain, by his newly-discovered process of vitro-heliography; and Mr. M'Craw also showed specimens of a process giving similar results, which he intended to patent under the name of vitrotype. In November of the same year Mr. Tunny described the process which he employed; but, though he burnt the pictures into enamelled glass, he failed in producing them without the disagreeable yellow tint, the consequence of the presence of silver.

Early in 1861 M. Joubert communicated to the Society of Arts *A New Method of Producing on Glass Photographic and other Pictures in Enamel Colours.* The following is the process which he employed:—A saturated solution of bichromate of ammonia, five parts, is well mixed with three parts of honey and three of albumen, and thinned with from twenty to thirty parts of distilled water. This solution, when well filtered, is poured upon a piece of well-cleaned glass, and, when it has been dried in the dark in a gas stove, it is placed with its face downwards on the subject to be copied in an ordinary pressure-frame. The subject, which must be a positive picture on glass or transparent paper, will, after exposure to the light, give a faint negative picture upon the bichromate coating. An enamel colour in finely-divided powder is gently rubbed upon the coating with a soft brush till the picture is seen in a perfect

ositive form. A mixture of alcohol with a small quantity of nitric or cetic acid is poured over the picture, and drained off at one corner. When the alcohol has evaporated the glass is immersed horizontally in large pan of clean water, and left till the bichromate is completely issolved, and nothing remains upon the glass but the enamel colour. When dried near a heated stove, it is ready to be placed in the kiln for urning. In this process enamel of any colour can be used, so that a ariety of colours may be printed, one after the other, in order to obtain perfect imitation of a picture.

M. Joubert suggests that his process may be advantageously used or the decoration of private houses and public buildings.

Mr. Taylor thought that, in regard to priority of invention in the namelled photographs, Mr. Burnett was entitled to the palm, as, if he ecollected aright, Mr. Burnett was in the field a considerable time be- ore Lafon de Camersac.

Mr. Burnett said that was indeed the case, for he had published everal articles on the subject before Camersac made his communication.

Mr. Burnett entered into some details in connexion with this discovery,

A letter was read from Herr Otto Köhnke, *On a New Mode of Obtaining Photographs without the use of Chloride of Silver or Hyposulphite of Soda;* but as this letter was substantially the same as that published in ur last, among the transactions of the North London Photographic Asso- iation, we do not again publish it. The result of the application was imilar in the case of both Societies.

Mr. Tunny stated that the Society had some money to spare, and he nquired whether they were inclined to set aside any of it for purchasing a really good and permanent printing process? He would recommend hat the carbon process of M. Joubert receive favourable consideration, as, from what he had seen of its results, he believed it capable of supplant- ng the ordinary method of printing for at least several purposes.

Several remarks on this proposal were made, but it seemed to be decided hat, in the meantime, the Society should take no steps in the matter.

After the usual votes of thanks, the meeting separated.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.

[In our last we were enabled to give only a portion of the proceedings of he meeting of this Society held on the 21st ult. We now give the re- mainder of the report.]

Mr. Turner exhibited, and proceeded to explain, the filter he had used with the most perfect success for the last seven years. It consisted of a stoppered globular funnel, capable of holding from 40 to 50 ounces, which was inserted into the centre neck of a triple-necked receiver, known among chemists as "Wolff's bottle," which would contain from 80 to 100 ounces. To one of the side-neck corks was attached a flexible tube, and through the cork of the opposite one a glass syphon was intro- duced. Each evening, on concluding work, he was in the habit of pouring the whole contents of his porcelain bath into the upper globe, the funnel end of which was stopped with cotton wool. On replacing the stopper no dust could possibly enter, and all that was required each morning was to blow the fluid out of the lower receiver through the syphon. By keeping his bath in this manner he had never experienced any difficulty in ob- taining clean pictures with certainty. By filtering through cotton wool, instead of paper, there was a large saving in the quantity wasted; in fact with the former there was no actual waste, as what silver was left in the wool could be re-used for redevelopments. He believed that the chief aim of a photographer should be to keep everything around him in the highest state of cleanliness; and though there was little possibility of anything passing into the lower receiver, still he was in the habit of thoroughly cleaning both vessels once each month.

Mr. Rejlander asked if in the process of blowing out any extraneous matter was passed into the bath?

Dr. Anthony said there was not, as the breath did not convey any deleterious matter into it.

Mr. Turner reminded Mr. Rejlander that the breath did not pass *into* the liquid: the pressure was only exerted *on the surface.*

Mr. Hart had been in the habit of filtering his bath, but used an appa- ratus different from the one shown by Mr. Turner. His consisted of an inverted bell-like funnel standing in a flattened circular receiver. He had an objection to the stopper, as it prevented the ether and alcohol evaporating, which was essentially necessary, particularly after a hard day's work. Both winter and summer he kept his bath in a water trough, by which he could arrange the temperature as required.

Dr. Anthony considered Mr. Turner's by far the most scientific appa- ratus for the purpose he had seen, and far preferable to the one employed by Mr. Hart, as by Mr. Turner's mode no organic matter could possibly get into the bath; and the tendency to spontaneous decomposition—that fertile source of pin-holes in pictures—would by this system be obviated. There was also another point in its favour: it enabled the operator to see when there was any tendency to milkiness, as the bath should always be clear, and any milky appearance would at once indicate that some- thing was wrong. He was an advocate for boiling the bath—and this should be done in a wide-mouthed vessel—as when the bath was charged with ether, spirit in large quantities was required to make the developer run, the use of which was a constant source of annoyance in the deve- lopment.

Mr. Rejlander said he would apply the money test, and buy one, if Mr. Turner would state where one could be obtained.

Mr. Turner said he had always been in the habit of boiling his bath, as it removed any tendency to greasiness; but he did not take the precau- tion either to warm his bath or his operating room. In reply to Mr. Rejlander he said the cost of the filter was £1. Though this seemed a large outlay, still he had saved the cost many times over by its use. He could undertake to supply them at ten shillings each if a number were required.

Mr. Rejlander laid upon the table a number of photographs, studies from life, which showed in how far photography was really the hand- maid of art. They were greatly admired, and the members present ex- pressed a decided opinion that Mr. Rejlander had gone very far towards placing photography among the fine arts, each of his works being so thoroughly characteristic, and bearing the impress of careful study in all its details.

Mr. Turner also exhibited three portraits, which were remarkably good in tone and of a great depth of focus. In reply to a question from the President, he stated that the negatives were taken with a half-plate Lerebour lens.

The formulæ for collodion and developer given by Mr. Charles A. Seely, at page 433 of The British Journal of Photography, having been read,

Mr. Turner, as promised, proceeded to remark that it would be abso- lutely impossible to work the collodion after coating the first few full plates, supposing that it was prepared with anything approaching 80 grains of cotton to the 10 ounces, as recommended. It would, by evapo- ration, become so gummy in its nature that, instead of an even film being obtained, the surface would be left in a series of ridges. He (Mr. Turner) was in the habit of making up his own collodion, and had never used more than 5 grains of cotton to the ounce. The following were the pro- portions and formulæ he used:—

Rectified ether	5 ounces.	With a small quantity of solution of iodine.
Absolute alcohol	3 ounces.	
Gun cotton	40 grains.	
Iodide of potassium ..	40 grains.	

Though this collodion would not keep longer than perhaps three months (up to which period it would work well), still, by the addition of a little new to the old, he had invariably found that he could obtain the best results; and it was seldom that any error could arise in producing a good picture with such an admixture. He could always get a denser picture with iodide of potassium than with cadmium or ammonium, and used iodide instead of bromide, as with iodide the collodion was suitable either for positives or negatives. The bath Mr. Seely suggested for use—forty to fifty grains—was far too strong, besides being a neutral one. The bath he (Mr. Turner) used, and which he had found from expe- rience to be the best proportions, he prepared from the following formula:—

Distilled water.....	20 ounces.	*Boiled*, and, when cold, to each ounce add two drops of nitric acid. Filter before use.
Nitrate of silver, 36 grains to the ounce, or	1½ ounces.	
Iodide of potassium, dissolved in distilled water	4 grains.	

With this collodion and bath, the time of exposure under ordinary circum- stances was from eight to ten seconds. The developer named by Mr. Seely next claimed observation, and in this, as in the previous formulæ, he would call the attention of the meeting to the disproportion existing between the various constituents:—two ounces of iron to the pint of water was most extraordinary. With a sensitive collodion, and the developer as strong as here recommended, it would be impossible for the operator to be sufficiently quick in his movements to get to wash the plate if pro- perly exposed. The developer being too strong was a constant source of stains. Twelve grains of iron to each ounce, for positives, and fifteen for negatives, was a good proportion. He believed that by using a weak deve- loper there was more *certainty* of obtaining a good picture; in fact, he did not believe that a refined picture, or fair blacks and whites, could be ob- tained by the use of a strong and quick developer for positives, though such an one might be obtained by chance. The following formulæ for developing solutions were the ones he used:—

	For Positives, No. 1.	For Negatives, No. 2.
Distilled water	20 ounces.	20 ounces.
Iron	4 drachms.	5 drachms.
Alcohol absolute	1 ounce.	1 ounce.
Acetic acid	6 drachms.	6 drachms.
or		
Glacial acetic acid	3 drachms.	3 drachms.

For *redeveloping* he always used iron as per No. 2, and obtained very vigorous pictures; but, if not sufficiently dense, he intensified, after well washing, with a weak solution of bichloride of mercury. The pictures he had that evening exhibited were produced in the manner and with the formulæ he had stated.

Mr. Hart said he manufactured his own collodion, and used only four grains of cotton to the ounce. He did not think it possible to work the collodion with anything approaching eighty grains. He was in the habit of using a forty-grain bath, but never an acid one, unless absolutely neces- sary—always a neutral one. If it fogged in the first few pictures, as it sometimes would, he never interfered with it. He used a developer of twenty grains of iron to the ounce for positives, and fifteen grains for

negatives; but varied the proportion according to circumstances. He used a stronger developer for his positives, because he could thus work them more expeditiously; and, being used to it, could always stop it at the right moment by washing. He agreed with Mr. Turner that a better picture could be obtained by a *weak* than a *strong* developer. He used iron first and pyro. afterwards for redeveloping, and intensified with plain silver and water. He found great difficulty with the pyro., as it neutralised the intensity of the silver. He found the addition of citric acid to the redeveloper acted better. He always filtered his silver before using, but did not like bichloride of mercury for intensifying.

Mr. Rejlander was of opinion that a weak developer was necessary to the production of half-tone in the picture.

Dr. Anthony said that a very strong bath was a fertile source of fogging, and with forty-five to fifty grains he could never get a clear picture: forty to forty-five grains required a large quantity of acid. He agreed with Mr. Turner that the collodion made from the formula he quoted would not keep. Iodide of potassium might produce a *vigorous picture*, but a bromide or other salt of cadmium was necessary for a *stable collodion*. For copying purposes he had always got a greater contrast from using a weak developer, and for reproductions he considered weak pyro. best, giving the image plenty of time. By the use of a weak developer for portraits there was too great a contrast of light and shade, and no half-tones; but half-tone was readily obtained by a strong developer. The late Mr. Lacey, of Ryde, used a strong developer, and the great beauty of his pictures was attributable to his great adroitness in *sweeping* the developer over the surface, and thus giving every portion an equal chance. He (Dr. Anthony) had been somewhat surprised to find that a strong developer produced a very far superior picture to a weak one, but in using a strong one everything depended on the expedition of the operator. He would show the members that much greater richness could be produced by increasing the quantity of spirit in, and flashing a strong developer across, the plate: there was a penetration of detail which could never be attained by using a weak one. He would remind the members that all the best pictures were taken without intensifying, which gives *crudity*.

A short discussion upon the strength of the bath for sensitising paper took place, during which Mr. Rejlander threw out the hint that it would be advisable to paper-salters to print in the corner of each sheet the number of grains and the salt used, as being a great boon to the consumer; after which Dr. Anthony exhibited two transparent positives produced by *strong* development. The meeting was then adjourned.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The adjourned annual meeting of this Society was held on Thursday evening, the 6th instant, at the Religious Institution Rooms,—Mr. A. Mactear in the chair.

The meeting was a purely business one. After the election of two new members, the meeting proceeded to the election of office-bearers for the ensuing year.

It was intimated that Mr. Kibble declined to accept the Presidentship of the Society for the next year. The following officers were elected:—*Vice-Presidents*—J. Jex Long and A. Mactear. *Treasurer*—A. Robertson. *Secretary*—James Ewing. *Council*—Messrs. Wilson, J. Spencer, Jun., Renfrew, Robb, Brown, J. Douglas, Turnbull, and Ralston.

Brief *viva voce* reports for the past year were then given by the Treasurer and Secretary.

A motion to compel those who exhibit any novelty at the meetings to describe the manner of their production was altered by its mover, Mr. J. J. Long, to a simple *request* for such description, which was passed by a majority.

The meeting was then adjourned.

THE PHOTOGRAPHIC SOCIETY OF MARSEILLES.

The usual monthly meeting of this Society was held on Friday, the 31st ult.,—M. Gabriel, President, in the chair.

The minutes of the previous meeting were read and confirmed.

The President announced the names of members newly elected, viz.:—M. de la Blanchère, of Paris, and M. E. Villot, of Avignon (corresponding members); MM. Coullet, Aynaud, Oddo d' Hambeton and Vuccina. He then produced the correspondence received, and read a copy of a letter addressed to M. Niépce de St. Victor, offering the congratulations of the Society upon the occasion of the award in his favour, made by the Academy of Sciences, of 500 francs annually for three years. He also read the answer of M. Niépce de St. Victor, expressing his gratification at the Society's kindness in making the communication to him.

M. de la Blanchère forwarded to the Society a copy of his *Repertoire Encyclopedique de la Photographie*, on the occasion of his election as a member of the Society, for which gift a vote of thanks was passed.

MM. A. de Roux and E. Loire laid before the meeting some very fine impressions of marine views of Marseilles—the first taken by the dry collodion process—and some portraits by the wet collodion method, which were much admired for their beauty, and the President thanked those gentlemen for exhibiting the same.

M. Jacquemot, the assistant secretary, then read a paper communicated by M. Poitevin, *On the Chemical Effects of Light** [see page 59], which was listened to with great interest. When the reading of the paper was concluded,

M. Vidal, the director of the scientific discussions, called the attention of the meeting to the curious chemical effects detailed in the paper, and proposed a vote of thanks to M. Poitevin, whose clever researches had thrown so much new light upon the phenomena of photographic science.—Agreed to.

The Secretary then read a paper upon *The Printing of Positives*† forwarded to the Society by M. Reynaud, of Paris.

M. Vidal, in proposing a vote of thanks to the author of the paper, recommended the process to the special attention of those who practise this art, as containing matters with which they should make themselves well acquainted.

The President then requested M. Reitziere to read the judgment given against MM. Mayer and Pierson, by the Correctional Court of Paris, on the 9th ult.

This having been done,

M. Vidal explained, in a few words, the reasons which had led the Committee to bring before the meeting a question so interesting to the art. He regretted that the legal decision was calculated to do a serious injury thereto, and therefore hoped, as it must necessarily lead to new debates upon the question, a more complete examination would be entered upon, and that it would be found that the decision of the Court could not be sustained.

M. Reitziere then clearly showed how injurious this decision would prove. He referred to those who had devoted years of experience and travel, encountered danger, and incurred expenses, who, by this judgment, were liable to lose the profits of so much enterprise through the selfishness of other persons. He illustrated his statement by reference to the remarkable undertaking of MM. Bisson Frères in the production of their views of Mont Blanc and its neighbourhood.

M. Suchet concurred in the views of the last two speakers, and added that MM. Dalloz and Rondu—two gentlemen of eminence as lawyers, whose opinions in such cases have great weight—consider that the copyright in photographic prints ought to be recognised. The speaker added, that without criticising the judges of the Correctional Tribunal, it was a proper course for the Marseilles Photographic Society no less to defend the art than to encourage it, and to give, under the circumstances, its testimony of sympathy, and also endeavour to interest the Legislature, against the effect of the late decision—thus affording to the sufferers the moral support of the Society.

M. Vidal requested the sense of the meeting on the proposition of M. Suchet, whose proposal was then unanimously adopted.

M. Meynier drew the attention of the meeting to his views on the intensifying of negatives by means of alkaline sulphides. He did not see any necessity whatever for the use of sulphate of iron: any alkaline sulphuret appeared sufficient to obtain a very dense negative without affecting the whites. He also directed attention to some experiments which he had made with collodion washed and treated with tannin, and also with collodion to which resin had been added, both of which had furnished him with rapid and constant results. The addition of benzole to collodion, with which he had experimented, appeared to increase the sensibility when employed in the wet state—two comparative experiments having been made, one with the addition of about 25 per cent., and the other without any addition.

M. Vidal, after having thanked M. Meynier for his communication, explained the causes of failure experienced by his honourable colleague in the use of tannin. He availed himself of that opportunity of showing to the meeting some negatives $9\frac{1}{2} \times 7\frac{1}{2}$, taken from negatives, on dry collodion, by the tannin process. [These negatives were very good.] M. Vidal then remarked that the greatest care was imperatively necessary if it were desired to avoid spots. He thought that they were sometimes caused by the introduction of a few drops of nitrate of silver bath between the glass and the collodion film. In order to guard against this defect, he (M. Vidal) had adopted a very simple plan, since which he had been almost entirely free from such causes of failure. It consisted in passing round the edge of the plate after it had been thoroughly cleaned a pencil dipped in a solution of gelatine or collodion. After this gelatinous border had set the collodion was poured on, and the film by its means was so firmly retained upon the plate that no fear need be entertained as to its becoming detached. The rapidity of the tannin process was quite sufficient, since a very intense negative was obtained in twenty-five seconds.

In continuation of the experiment commenced at the meeting of December, M. Vidal developed a negative which had been exposed on the 14th December, and with equal success. He showed also a plate sensitised on the 12th December, upon which he had obtained a very satisfactory picture on the 31st January in less than a quarter of a minute. They therefore retained their sensibility unimpaired for full six weeks after sensitising, and were also unaltered in other respects. The impression was also equally brilliant.

M. Vidal promised to describe the whole manipulation connected with

* The paper above-mentioned is the *second* from M. Poitevin on the same subject. The *first* paper appeared in our Number for Feb. 1st.

† This paper will appear in our next—Ed.

his process very shortly, so as to enable the Society to judge of the process for strengthening negatives by means of sulphide of potassium. He produced two positive prints taken from the same negative—one before the intensifying process was used, the other after its application.

The meeting thanked M. Vidal for his experiments.

M. Hudelot, on behalf of M. Ponçon, exhibited an improved pressure-frame, and the President requested MM. Hudelot and Tenis to report on the same at the next meeting.

M. Vidal drew the attention of the meeting to the subject of a design formed by the Committee for publicly distributing rewards to successful practitioners, a report on which would be brought forward at the following meeting. The members were requested to think over the matter and to aid the Committee with their ideas thereon. He then proposed, on behalf of the Committee, that a gold medal, of 500 francs value, should be offered for the production of a process for the preparation of dry plates, by which instantaneous pictures could be obtained, enforcing his remarks by calling attention to the importance of the subject, and announced that the conditions of the award, to be made at the endof 1863, would be laid before the next meeting of the Society. He also suggested that a medal of 250 francs value might be properly awarded to the candidate who made the nearest approach to perfection in the process, although absolute perfection might not be reached; in which case the period for the award of the large prize might be carried forward to the end of 1864, with an augmentation of 300 francs.

This proposal was unanimously agreed to.

Some members of the Committee then undertook to report finally on the subject, and settle the terms of the competition, after which the meeting was adjourned.

New Books.

Traité Populaire de Photographie sur Collodion, &c., par D. van Monckhoven.

Paris:—Leiber, No. 13, Rue de Seine, St. Germain.

To those who are familiar with French photographic periodical literature the name of M. van Monckhoven, as the author of a popular treatise upon an unprecedentedly popular art, will be sufficient guarantee for its utility and excellence. Our readers will probably have noticed in the letter from our esteemed Paris correspondent, which appeared recently, an intimation that the work before us is highly appreciated by Parisian photographers. Almost simultaneously with the receipt of M. Lacan's letter we were favoured also with a copy of the work direct from the author, from whom also we have special permission to make certain extracts, of which permission we shall certainly avail ourselves shortly for the benefit of our readers.

One of the peculiar features of the work consists not so much in its copious illustration by woodcuts (as that is one common to many similar productions in this country), but in the fact that the illustrations are, many of them, of a character which enables the student more readily—or perhaps we should say with less disadvantage—to dispense with personal instruction in order to acquire the art; for a large proportion of the cuts consists in admirably-executed illustrations of operators in the act of performing the needful manipulations—simple enough to the skilled operator, it is true, but presenting almost insurmountable difficulties to those who have no opportunity of *seeing* them performed before attempting them from description. To all such—and their number is considerable—the work before us will be found indeed a boon; for, in addition to the graphic nature of the important illustrations, the whole subject is treated in a popular manner, in simple language, yet upon principles that are perfectly sound.

The present treatise is not entirely the work of M. Monckhoven, inasmuch as it consists of an *abstract* of his larger one, the *Répertoire Général de Photographie*, made by the author's two friends, MM. A. T. Dupont and F. Deshays, the manuscript having been finally carefully corrected by the author of the original work.

After glancing at the various photographic processes, a chapter is devoted to a sort of expanded programme of the course of operations recommended in the treatise, showing what the operator has to do, leaving the *how* it is to be done for detailed instructions in the chapters which follow. These treat respectively of the substances which enter into the composition of collodion—the preparation of photographic collodion—cleaning the glass plates—of the dark room and laboratory—how to coat the glass and sensitise the film—photographic apparatus—the glass room, and how to take pictures—the development of the image—fixing and strengthening the image—varnishing. Then follow chapters on dry collodion—on direct positives—on the stereoscope—and on positive paper printing. To these are appended twelve notes on important subjects, with special references to preceding parts of the work, with which it would be needless to trouble the *debutant*, but which are highly useful when he becomes somewhat familiarised with his work.

The author is desirous of his treatise being published in English, and was good enough to make overtures for our undertaking the translation and editing the same. The work is one which, without being superior to several already published in this country, is exceedingly good, is written in a novel style, and would, no doubt, prove popular. We trust that it will yet appear in an English dress.

Correspondence.

MR. REYNOLDS'S IRON PRINTING PROCESS.

To the Editor.

Sir,—So much has recently appeared in the pages of your valuable Journal, relative to the process for printing photographs which I proposed some time ago, that I am sure you will permit me to offer some explanatory remarks respecting it.

What I wish to do now is, not to uphold the novelty of the process in question—for no one can be more convinced than I am now that it is not new—but rather to assist in rendering "honour to whom honour is due," and to prove that, although a similar process was already in existence, yet until the week after the publication of my paper I was not aware of the particular subject having been broached before.

With regard to the first point, as to who is the original discoverer of the process, I think, judging from your own observations and those of others, that Sir J. Herschel is really the author of it. If such be the case, it is evident that all subsequent observers must be placed in pretty nearly the same position that I am.

In your last number I saw a letter from Mr. B. T. Macdonald, in which he claims priority of discovery to me, and, therefore, "any credit which may attach to this discovery." I doubt much whether he would be so anxious *now* to put in his claim, as he says himself that he made the observations only about a year ago, so that he must be added to the list of what might be called supplementary discoverers.

It now remains for me to endeavour to prove to your satisfaction and that of your numerous readers that I really worked out this process from the first without receiving any assistance from the observations of others—in fact, without being aware of such observations having been made. The whole matter originated in the following manner:—Some experiments were being carried on under my direction in the laboratory of the Dublin Chemical Society, having a particular object in view which it is not necessary to state here. In one case a solution of oxalic acid was added to an alcoholic solution of certain organic bodies, in which a persalt of iron was known to be present. No precipitate was observed at first; but, on looking at the mixture after it had been exposed to diffused light for a few days, a lemon-yellow crystalline powder was found to have deposited. It was of importance that the composition of the precipitate should be ascertained: this was done, and I found it to be an oxalate of the protoxide of iron. Following up the subject without any ulterior object beyond wishing to gain some precise information respecting these salts, it occurred to me that the power which the solar rays possessed of reducing the peroxalate of iron to the state of protoxalate might be made use of in a photographic sense. This I have done, with what results you are already aware. Having made the commencement the subsequent steps of the process are such as would suggest themselves to any one engaged in a matter of the kind who was only moderately acquainted with the reactions of the proto- and per-salts of iron, more particularly to one continually engaged in analytical operations.

Such is my explanation of the whole matter. However, I do not ask you to trust simply to this statement, but would refer you to a paper of mine on *The Oxalates of Iron*, which appeared in a late number of the *Chemical News* (No. 110, vol. 5), for a confirmation of what I have said here. You will find therein described with the necessary minuteness the method adopted to ascertain the exact nature of the reaction which ensues on treating protoxalate of iron with ammonio-nitrate of silver. You will likewise see that I took advantage of the reaction for the purpose of determining the correct formula of the protoxalate of iron which has recently been incorrectly stated.

Trusting you will excuse me for occupying so much of your space with what may be considered a merely personal matter,

I am, yours, &c., EMERSON J. REYNOLDS.

Dublin, February 11th, 1862.

[We may have something to say on this subject in our next number.—Ed.]

PHOTOGRAPHY AND THE INTERNATIONAL EXHIBITION.

To the Editor.

Sir,—There can be no doubt that, as far as the forthcoming International Exhibition is concerned, the Exhibition of Photographs will be far from satisfactory. Now, however, it is only possible to regret the decision to which the Royal Commissioners have come on the subject, and to put in a strong protest against such treatment of an art which, it is no exaggeration to say, all conditions of men, in some way or other, daily make use of and are thankful for.

I do not propose to enter into an argument on the position of photography amongst the fine arts. As far as the present case is concerned the Commissioners have prejudged the whole matter, and it is therefore needless.

But I would remind you that this summer, which will find us still protesting against our grievance, will also find London, and indeed the whole country, more crowded with foreigners *and photographers* than is likely to be the case again for many years. And this summer English photography will exhibit its progress and condition during the last ten years in a space somewhere about the size of the rooms in Pall Mall, and in the good company of lenses, tents, chemicals, cameras, and the Education Committee. To improve the matter, it has been thought better not to hold the annual Exhibition.

Under these circumstances, I strongly urge the necessity of holding a separate Exhibition of Photographs, in order that all who may take an interest in the subject may have a *fair* opportunity of judging of the skill of English artists. I believe that if photographers will but make up their minds to this, it would not be difficult to find the means. Indeed three plans for doing so almost directly suggest themselves.

From the known liberality of the directors of the Crystal Palace I have no doubt that arrangements might be come to for suitable exhibition space at Sydenham. And I do not see that the objections to this are many or great.

The proposed supplementary Exhibition offers another opportunity for a display of photographs.

Again, the ordinary annual Exhibition might be held in the rooms in Pall Mall (or other suitable rooms) in the summer. The advantage of either arrangement would be that copies of photographs might be purchased on the spot.

I do not urge these as good plans. Doubtless if the matter were taken up, other and better suggestions would be made. But I do urge, and urge most strongly, that English photographers should not let this grand opportunity pass of showing to their continental brethren a worthy collection of their pictures, and of proving to the world at large that photography *does* deserve to be classed with the fine arts.

To you, sir, and to your readers, I commend this consideration: it can be in no better hands.—I am, sir, yours, &c. E. E.

Cambridge, February 10th, 1862.

[The preceding letter accords very closely with the remarks which we have already made in our leading article. We consider that the Council of the Photographic Society will be guilty of neglect of duty if it does not find some legitimate vent for the effective exhibition of a mass of valuable pictures already prepared in the expectation of finding a home in the World's Fair. The Crystal Palace would be better than nowhere, but we fancy a much better locality might be found than at Sydenham.—Ed.]

THE MANCHESTER PHOTOGRAPHIC SOCIETY.

To the Editor.

Dear Sir,—In common with several of your subscribers I shall be glad to know what the Manchester Society is doing in the matter between Messrs. Dancer and Pyne, both of whom are, I believe, on the Council of that Society. It has been referred to in police reports. I should also add that I always look out for reports of the Manchester meetings, and some time has elapsed since I was gratified with the sight of one. I am, yours, &c., PHOTOPHILUS.

February 8th, 1862.

[The first matter referred to in the above communication is one falling peculiarly within the province of the Council of the Society to deal with. With respect to the second point named, we have had an explanatory note from the Secretary stating that as the whole of the evening of the 8th ult. was occupied with an exhibition of pictures on the screen, there was no report to send for publication. Our correspondent will find the proceedings of the last meeting duly reported in the present number.—Ed.]

PORTABLE BACKGROUNDS.

To the Editor.

Dear Sir,—In thanking you for your detailed description of the making of a portable background for out-door portraiture, I also wish to thank your correspondent, "Another Amateur," for pointing out to me a few of its defects; but I cannot see how they are to be avoided in both our cases, as it would never do to *keep* it out of doors—so I think I shall commence to make one according to your description, but before doing so I shall call on the Messrs. Bull, of Great Queen Street. With thanks for past favours, and hoping I am not too late for your next,

February 10th, 1862. I am, yours, &c:, AMATEUR.

PER-OXALATE OF IRON.

To the Editor.

Sir,—In the Journal for the first of January there is an interesting article by Mr. Reynolds, *On a New Process for Photographic Printing*, by employing the oxalate of the per-oxide of iron instead of nitrate of silver for sensitising the paper. If Mr. Reynolds would kindly give some more definite directions for making that salt he would greatly oblige me and perhaps many others of his readers. He merely says—"The oxalate of the per-oxide may be prepared by dissolving hydrated per-oxide of iron in a solution of oxalic acid;" and further directs an excess of acid to be given.

I first took about an ounce of each (which leaves an excess of ⅝ of an ounce of acid), and having dissolved the latter in distilled water I added the iron, and boiled the whole together for about an hour, keeping up the supply of water, and conducting the whole operation in the dark. I then filtered it through bibulous paper, when the fluid came through perfectly black, while the precipitate was of a brownish red. I did not wash it, the precipitate being, according to Mr. Reynolds, very soluble, so that it must have contained much free acid.

I next placed a small portion of it in a test tube, which I nearly filled with water, and shook well up and set it aside in the dark for twenty-four hours, when I found *the whole had settled to the bottom*. I then placed some more on a china plate, and dried it in strong sunlight, when instead of "forming a yellow powder" it merely became a few shades browner. I have been over the experiments repeatedly, and have tried adding the iron and acid according to their respective equivalents, and after boiling together, adding the excess of acid and filtered through calico, but with a like result; and I am driven at last to request Mr. Reynolds to give me more information on the subject—it having been my intention to go through a regular course of experiments on the subject.

It will be a great boon to photographers in general if a cheap salt, such as the one in question, can be made to supersede the silver: it is, however, by many believed that it will never rise to be anything beyond an interesting experiment, as it is thought to be far less stable and more easily oxidised by the chemical agents more or less always present in the atmosphere than the salts of silver.

I am, yours, &c., MARTIN HENRY PAYNE.

2nd Feb. 1862.

[No wonder our correspondent has failed, having thrown away the solution of the salt made in what he calls the black fluid, and preserved only the excess of insoluble per-oxide of iron.—Ed.]

ANSWERS TO CORRESPONDENTS.

Bothered.—Oxide of silver will correct it.

Leeds.—We gave all the information that had reached us.

F. O. B.—You will find a mixture of the two kinds suit you best we imagine

Old Boy.—Has forgotten his youth evidently, or he would not be so disturbed at a joke.

S. D.—I. W.—C. J. F.—Typo.—M. Growler.—F. Smith.—and several others. Received. See leader in reply.

M. P.—1. Not worth a straw.—2. Take number five of the lenses named.—3. Good.—4. Too much chloride: half the quantity is enough.

T. L.—We do not intend taking part in the controversy. We regret that our name has been mentioned therein; but it was not a matter under our control.

C. Blake.—We have made arrangements for some *original* articles by the gentleman you name; it will not therefore be necessary to translate what you indicate.

Stereo.—We believe that it is the intention to award medals for the best photographs; but we are not aware that any absolute decision has yet been arrived at.

Grotius.—Messrs. Murray and Heath will no doubt attend to your instructions, and make whatever you desire in the form of apparatus, whether it be current or not as a trade article.

Querist.—You cannot produce stereographs, properly so called, from an engraving; though by cutting it up you may manage to effect the appearance presented by the set scenes at a theatre.

A. Y. (Brighton.)—Moisten the stains with tincture of iodine, and when dry a solution of iodide of potassium will remove them. Again: common chloride of lime (as it is called, commercially) made into a thick cream with water will remove the stains, if you are not too much in a hurry.

Jno. Cruikshank.—Such a stersoscopic lens as you mention will *not* do for a *carte de visite* of the usual size: you are requiring too many applications to allow all of the best qualities for each purpose to be comprised in one lens. That which is best for architectural subjects so as to ensure freedom from distortion at the margin is not best for "instantaneous" pictures, the former being a comparatively slow lens. Again: you require for *cartes de visite* a double combination lens with an unusually flat field. We should advise you to have a separate lens for the latter purpose, and a pair of stereoseopic lenses as well.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 161, Vol. IX.—MARCH 1, 1862.

Mr. E. J. Reynolds on Iron Printing.—In our last we published a letter in explanation from Mr. Reynolds relative to the supposed new iron printing process suggested by him; but, as it came to hand only just before "going to press," we had no time to inquire into the accuracy of the statements therein put forth. We have now done so, and are convinced that Mr. Reynolds was no plagiarist, although he had long before been forestalled in the bulk of his photographic investigations relative to the peroxolate of iron. On reference to Mr. Reynolds's article in the *Chemical News*, to which he solicits our attention, we find some points which may be of interest to our readers, and therefore cull the following extracts:—

"About a year and a-half ago, in the course of some experiments, I had obtained a solution of a persalt of iron in strong alcohol. On adding oxalic acid no precipitate was observed at first, but, after being exposed to ordinary light for a few days, a yellow crystalline deposit was observed: an examination of the minute precipitate was sufficient to convince me that it was a compound of oxalic acid with protoxide of iron. Not finding any information on this subject in the ordinary 'Handbooks,' I referred to Berzelius's *Traité de Chemie*, and found that Döbereiner had noticed this remarkable reaction which took place under the influence of the solar rays many years ago. Following up the subject, without any interior object beyond wishing to obtain some information respecting these salts, it occurred to me that the power which the actinic rays possessed of reducing the peroxalate of iron to the state of protoxalate might be made use of in a photographic point of view. It would be out of place for me to speak now of the *modus operandi* of my process for printing by light based on this reaction, as a notice of it has already appeared in a late number of this Journal. It is sufficient to say that the results of the experiments which were necessary in working out the process have given me the means of establishing the correct formula for the oxalate of the protoxide of iron." * * * * *

"*Reactions of the Oxalates of Iron.*—Under this head I merely wish to draw attention to the theoretical explanation of the change which occurs on exposing oxalate of peroxide of iron to ordinary light; and likewise to demonstrate the nature of the reaction which takes place on treating protoxalate of iron with ammonio-nitrate of silver.

"According to Döbereiner, the following equation represents the change which takes place on exposing solution of peroxalate of iron to the light:—

$$C_{12}Fe_4O_{24} = (C_4Fe_2O_8) + CO_2.$$

"The sensitive surface which I use in printing by light is the ammonio-ferric oxalate, which has no solvent action on the deposit of protosalt formed under the influence of light; whereas, if the plain peroxalate were used, the moment water was applied to the paper it would dissolve and attack the oxalate of the protoxide, over which it exerts considerable solvent power. I only mention this to show my reason for using one salt in preference to another.

"The equation which Döbereiner has given for expressing the decomposition under the influence of the solar rays is, doubtless, quite correct when the persalt is in solution; but, when the persalt is in the solid state and exposed to the rays of the sun, it blackens. If the blackened powder be now immersed in water the yellow protosalt is immediately produced. This fact was first noticed by Dr. Phipson, and I have frequently had occasion to corroborate the observation. It appears to me to be very probable that this black substance is the protoxalate in the anhydrous condition, which, on coming in contact with water, assimilates two equivalents, thus becoming the ordinary hydrated oxalate. I have not yet had time to verify this supposition.

"With regard to the reaction between ammonio-nitrate of silver and protoxalate of iron, I think the following equation will show more clearly than words can the nature of the decomposition which occurs. The experimental grounds on which it is based have been already given in the first part of this paper:—

$$(FeO,C_2O_3) + (AgO,NO_5 + NH_4O) =$$
$$Fe_2O_3 + Ag + (AgO,C_2O_3) + NH_4O + (NH_4O,NO_5.)$$

"I need only remark that the excess of ammonia holds the oxalate of silver in solution, from which it is precipitated on neutralising the free alkali."

M. Mc-A. Gaudin, the editor of the French Photographic journal, *La Lumière*, has shown much interest in connexion with Mr. Reynolds's paper. He has reproduced also much of the discussion, and in the last number of his Journal makes the following observations with reference thereto. After alluding to Mr. Hannaford's remarks, he says:—"He is perfectly correct when he states that the development of the impression by means of nitrate of silver would form chloride of silver in the paper which a simple washing would be insufficient to remove, and which, sooner or later, would deteriorate the light. Mr. Reynolds, on the other hand, says that these chlorides ought to be eliminated by the *excess* of ammonia which exists in the ammonio-nitrate of silver. This salt has always an alkaline reaction on test paper; but if it contain in reality free ammonia, this ammonia, capable indeed of dissolving easily chloride of silver, will decompose also the oxalate of iron, producing free oxide of iron, which would colour the paper yellow without remedy. But will ammonio-nitrate of silver, worthy of this name—that is to say, prepared with excess of ammonia, *then boiled*—dissolve chloride of silver? It appears to me doubtful. I am unable at present to throw any light relative to this fact; but without reckoning, like Mr. Reynolds, on the free ammonia, which I do not believe exists, I think however that the solvent power of the ammonio-nitrate of silver would be sufficiently strong to remove naturally the slight traces of chloride of silver formed spontaneously in the papers of commerce.

"I have continued to make experiments, in order to arrive at producing by this process proofs without recourse to nitrate of silver. I have proved that the peroxalate of iron is more sensitive with a slight excess of oxalic acid, and, above all, when combined with some organic matter such as gelatine; and I expected even by this last addition to obtain impressions that would well resist the washing, in consequence of the coagulation of the gelatine. I have been deceived in my expectations. Washing with water causes the impression to disappear rapidly, and almost entirely, leaving only a general yellowish tint, which, with tincture of nut-galls, forms a negative image.

"Impressionability is always very slow, and I begin to believe that this process, which at first had attracted me, offers no superiority over the iron processes already published."

Photographic Piracy, and Property in the Negative.—We have frequently felt our indignation rising when noticing in some shop windows in the metropolis, exposed for sale, numerous photographic portraits that were palpably only copies from proofs upon paper which had unquestionably been taken without the consent of the owners of the original negatives;

for no one would be so suicidal as to place such inferior productions in the market, to the detriment both of his pocket and reputation. As bearing upon this question we would direct the attention of our readers to the report of a trial which will be found in another column, the well-known eminent photographer, Mr. Mayall, being the plaintiff in the action. The issue we regard as certainly satisfactory; for, though a point of *law* is reserved, the learned Judge has not hesitated to pronounce upon the equity of the case. This brings us to the consideration of another question of no trifling importance, viz., in whom rests the property of the negative? It is not quite so easy to answer this question satisfactorily as might at first be supposed. Of course we are presuming that no specific agreement has been entered into respecting it. There can be no question as to the right of property when a photographer has taken the negative of a landscape on his own account, and with his own materials; but we refer more particularly to negatives of portraits taken in the ordinary course of a professional photographer's business.

It is a common practice to make a certain charge for one copy of a portrait, subsequent copies being usually supplied, and reasonably so, at a very much reduced rate. We presume the understanding is pretty general that the higher sum paid for the first copy is to cover the cost of taking the negative. It may be contended that as this higher sum is charged for taking the negative it therefore becomes the property of the sitter or purchaser of the original photograph; but, on the other hand, it must not be forgotten that also, *as a rule*, extra copies are offered to be supplied at a lower rate, though at one higher than would pay for the mere cost of printing—therefore this would seem to imply a property of some kind on the part of the operator or his principal. The question for solution then is, what amount of interest can each party to the transaction claim according to law, and who is entitled to the custody of the negative? Regarding the latter, we apprehend that *custom* would rule in the absence of any express stipulation, and there can be no doubt that custom is in favour of the retention by the photographer of the negative.

But then arises another difficulty. If the negative be the property of the photographer and not of the photographee, what is to prevent the former from publishing as many proofs from any negative as he may please, possibly to the intense annoyance of the original? Of course we do not imagine that any of our artist-photographers of high standing would attempt to adopt such a course; but the case supposed is quite within the range of probabilities, and will, no doubt, have to be decided one day or other. There are several other points of view from which these questions might be argued, and we may ere long return to them.

American Correspondence.—We have much pleasure in introducing to our readers, as our special American Correspondent, Mr. Coleman Sellers, whose first direct communication will be found in the present number. Mr. Sellers, besides being a photographer of no mean repute, is connected with the engineering profession, and in frequent communication with many men of scientific pursuits in the American States. Mr. Sellers proposes to keep our readers *au courant* with all that passes of interest in our art on his side of the Atlantic. It would be a work of supererogation to bespeak for him a hearty welcome.

NOTES ON PHOTOGRAPHIC CHEMICALS.

By James Martin.

PROTOXALATE OF IRON.

Synonymes—Ferrous Oxalate.
Composition—$Fe\,O, C_2\,O_3 + 4\,HO$.
Equivalent—108.

Preparation.—Though the attention of photographers has but recently been directed to this substance, it has been known to chemists and mineralogists for many years. In works on the latter science it is described as being found in brown coal strata, in the form of *Humboldtine* or iron-resin, possessing a yellow colour, and a specific gravity of 2·13. It rarely occurs in capillary crystals; generally in crude masses, of fibrous granular or compact texture, somewhat harder than gypsum. It is easily friable, and when heated on charcoal yields a vegetable odour and a black residue (Fe^3, O^4), which is magnetic. There are two ways of preparing this substance artificially, the simplest is by the decomposition of protosulphate of iron by means of oxalate of ammonia. A solution of 139 grains of protosulphate of iron is made in four ounces of distilled water, and to this, when filtered, is added a solution of 71 grains of oxalate ammonia in other four ounces of distilled water. The interchange of the proximate constituents of these two solutions results in the formation of sulphate of ammonia, which remains in solution, and protoxalate of iron, which is precipitated in the form of a yellow powder difficultly soluble in water. The same substance may be obtained by acting on clean iron wire with a solution of oxalic acid: hydrogen gas is at first disengaged, and by degrees the liquid deposits a bright yellow powder of protoxalate of iron. This solution of iron in oxalic acid possesses a sweetish astringent taste, and, during its preparation, and before the acid is completely saturated, if set aside and allowed to cool, yields yellowish-green prisms, very soluble and efflorescent, which appear to be an acid protoxalate of iron, or probably an oxalate of the black oxide of iron, *i.e.* ferroso-ferric oxide. The fact, however, which is most interesting to photographers is that *the same salt precipitates spontaneously on exposing an acid solution of peroxalate of iron to the sun's rays.*

Properties.—These have been incidentally described in treating of the preparation. The salt is soluble in excess of oxalic acid, and also *in a solution of peroxalate of iron;** and, although precipitated on mixing moderately strong solutions of the appropriate reagents, it cannot strictly be regarded as absolutely insoluble in water.

Uses.—The protoxalate of iron has as yet received no direct application in photography.

Impurities.—This salt can hardly be said to have taken a position as a commercial article, and would doubtless, therefore, if purchased at a chemist's, be supplied in a state of virgin purity.

Tests would, therefore, be hardly necessary. Should it be desired, however, to submit a specimen for examination, it may be mentioned that 108 grains being heated to redness should leave a residue of 40 grains of peroxide of iron.

PEROXALATE OF IRON.

Synonymes—Ferric Oxalate.
Composition—$Fe_2\,O_3\,C_2\,O_3$.
Equivalent—116.

Preparation.—According to the authorities cited by Gmelin—namely, Bergman and Bucholz—this salt is produced when hydrated ferric oxide, *i.e.* peroxide of iron, is treated with oxalic acid not in excess, or when oxalate of ammonia is added to a solution of a persalt of iron. In the latter case the alkaline oxalate, which should not be in excess, results in the gradual production of a precipitate of a lemon-yellow colour nearly insoluble in water, and separating in the form of an ochre when boiled with water. This may be regarded as the normal peroxalate of iron, and it is this salt which, on being treated with excess of oxalic acid, yields a solution which, when exposed to ordinary daylight, becomes gradually of a yellowish-green colour, continually gives off carbonic acid, and deposits crystals of ferrous oxalate, till all the iron is converted into that salt, and the liquid becomes colourless.

Properties.—In considering these, it is important to understand clearly the distinctions between what is usually described by chemists as peroxalate of iron and that which seems likely to come into use among photographers. The former is described as a difficultly soluble yellow powder, long in subsiding from the mixed solutions in which it is produced, and which is taken up again by excess of oxalic acid. (It may be mentioned, incidentally, that this property which oxalic acid possesses, of dissolving the insoluble persalts of iron, gives rise to its application in the removal of iron-moulds, which it does without injuring the texture of the fabric so treated.) To resume: the latter salt, which may be called the photographic salt, is an acid solution of the former, having a yellowish-green colour, which it gradually loses on exposure to light, suffering decomposition into carbonic acid and protoxalate of iron,

* This latter fact has an important bearing on the method of printing with peroxalate of iron, the exposure of which to light gives rise to the formation of *protoxalate* of iron, through the decomposition of a *part* of the peroxalate. The immersion in water which follows the withdrawal from the pressure-frame allows the undecomposed *peroxalate* to enter into solution, when it exercises a solvent action on the *protoxalate*, and thus destroys the sharpness of the outlines of the picture. This result may be avoided by washing the print in acid oxalate of ammonia instead of in water.

which is deposited from the *solution* in the form of a *yellow powder*, which is the hydrated salt. If, however, paper be saturated with the persalt, *dried*, and exposed to light, the protosalt resulting from the exposure is not yellow, but of a *dark* greenish tinge: this is the protosalt in the anhydrous condition, which speedily assumes the yellow colour on immersion in water.

Uses.—These will be found fully described in a paper read by Mr. Emerson J. Reynolds before the Dublin Chemical Society, and published at page 9 of the present volume. The advantages to accrue from its use, as therein set forth, seem to be cheapness, rapidity of production, and increased permanency in the photograph. These points, however, can scarcely be regarded as fully established until the accumulated experience of a number of photographers has been brought to bear on the matter.

Impurities.—Under this head similar remarks apply to those made in reference to the protosalt. The only defect likely to occur in a purchased article would be a deficiency of base, arising from inadvertent exposure to light; to avoid which the amateur had better prepare his own salt—a very simple operation, requiring only a limited supply of apparatus.

Tests.—A rough estimate of the value of solutions of this salt may be formed by the vivacity with which it disengages carbonic acid gas on exposure to direct sunlight.

[Our next number will contain an article on this subject from the pen of Mr. Emerson J. Reynolds.]

THE EARLY HISTORY OF PHOTOGRAPHY.

WE publish, by permission, the following correspondence, involving many points of interest worthy of recording in connexion with the early history of photography on paper. Already several whose names have been associated from the commencement with the rise and progress of our art have passed away from amongst us; and it is advisable to secure the testimony of some who are still living relative to the earlier investigations, in order that our history may not in the future be at fault relative to certain matters of fact:—

From LYNDON SMITH, Esq., to the Rev. J. B. READE.

Leeds, Dec. 12, 1859.

DEAR SIR,—I am preparing a lecture on photography, to be read before the Church Institute here, and I am taking the liberty of writing to ask you a question or two about your early connexion with the art. My reading certainly inclines me to think that photography on paper owes more to you than to any one, and that Fox Talbot has received far too large a share of the honour of the invention. I should like to know, however, when you first used iodide of silver, and what led you to substitute it for the chloride? Talbot seems to have used it first for *fixing*, and says it is quite insensitive to light. Did you take the idea from the daguerreotype?

Then, as to gallic acid, you did not (I believe) use it first as a developant, but simply because it gave you greater intensity. Did you not discover that developing property after Fox Talbot's publication of his method? I have been told you are a Leeds man: may I take the liberty of asking whether this is true? I shall only be too glad to greet you as a townsman. I trust you may find time and opportunity to satisfy me on these points; and any other information in the history of the art will be thankfully received. Again apologising for thus troubling you, believe me, dear sir, yours truly,

Rev. J. B. Reade. LYNDON SMITH.

From the Rev. J. B. READE to LYNDON SMITH, Esq.

Ellesbro' Rectory, Tring, Dec. 16, 1859.

DEAR SIR,—Let me say, first of all, with reference to the close of your note, that, like other Yorkshiremen, I am proud of my county and of my native town; and I only regret that my distance from Leeds will prevent me from being present at the Grammar School anniversary on the 28th instant, a notice of which I have just received. I will also state that your note has been delayed for a few days in consequence of a error in the address. I left Stone a few months ago, after residing there nearly twenty years, and I have now taken the adjoining Rectory of Ellesbro', on the presentation of Lady Frankland Russell, and Tring my post town. So much for preliminaries.

Your photographic queries will receive a general reply from the account of my "Early Experiments in Photography," of which I beg to forward you a copy. It was published in the *Philosophical Magazine* for May, 1854, before I heard of Talbot's legal proceedings, and it naturally led to my being placed in the witness-box by the defendant, Laroche. I also send a short chemical paper, which contains one or two allusions to photographic phenomena.

No one can dispute my claim to be the first to suggest the use of gallic acid as a sensitiser for prepared paper, and hyposulphite of soda as a fixer. These are the keystones of the arch at which Davy and Young had laboured;—or, as I may say in the language of another science, we may vary the tones as we please, but here is the fundamental bass. My use of gallate of silver was the result of an inference from Wedgwood's experiments with leather. Mrs. Reade was so good as to give me a pair of light coloured leather gloves that I might repeat Wedgwood's experiments; and, as my friend Mr. Akerman reminds me, her little objection to let me have a second pair led me to say—"Then I will tan paper." Accordingly, I used infusion of galls, in the first instance, in the early part of the year 1837, when I was engaged in taking photographs of microscopic objects. By a new arrangement of lenses in the solar microscope I produced a convergence of the rays of light, while the rays of heat, owing to their different refractions, were parallel or divergent. This fortunate dispersion of the calorific rays enabled me to use objects mounted in balsam, as well as cemented achromatic object glasses; and, indeed, such was the coolness of the illumination, that even *infusoria* in single drops of water were perfectly happy and playful. (*Vide* abstracts of the *Philosophical Transactions, Dec.* 22, 1836.) The continued expense of an artist—though at first I employed my friend, Lens Aldons, to copy the pictures on the screen—was out of the question. I therefore fell back, but without any sanguine expectations as to the result, upon the photographic process adopted by Wedgwood, with which I happened to be well acquainted. I was a *weary while*, however, before any satisfactory impression was made either on chloride or nitrate paper. I succeeded better with white leather; but my fortunate inability to replenish the little stock of this latter article induced me to apply the tannin solution to paper, and thus I was at once placed, by a very decided step, in advance of earlier experimenters, and I had the pleasure of succeeding where Talbot acknowledges that he failed.

Naturally enough, the solution which I used at first was too strong; but, if you have ever been in what I may call *the agony of a find*, you can conceive my sensations on witnessing the unwilling paper become in a few seconds almost as black as my hat. There was just a passing glimpse of outline—"and, in a moment, all was dark." It was evident, however, that I was in possession of all, and more than all, I wanted, and that the *dilution* of so powerful an accelerator would probably give successful results. The large amount of dilution greatly surprised me, and, indeed, before I obtained a satisfactory picture the quantity of gallic acid in the infusion must have been quite homœopathic; but this is in exact accordance with modern practice and known laws. In reference to this point, Sir John Herschel, writing from Slough, in April, 1840, says to Mr. Redman, then of Peckham (where I had resided), and now a photographic artist in Cornhill:—"I am surprised at the weak solutions employed, and how, with such, you have been able to get a depth of shadow sufficient for so very sharp a re-transfer is to me marvellous." I may speak of Mr. Redman as a photographic pupil of mine, and at my request he communicated the process to Sir John, which, "on account of the extreme clearness and sharpness of the results," to use Sir John's words, much interested him.

Dr. Diamond also, whose labours are universally appreciated, first saw my early attempts at Peckham in 1837, and heard of my use of gallate of silver, and was thus led to adopt what Admiral Smyth then called "a quick mode of taking bad pictures;" but—as I told the Admiral in reply—*he* was born a *baby*. Whether our philosophical baby is "out of its teens" may be a question—at all events, it is a very fine child, and handles the pencil of nature with consummate skill.

But of all the persons who heard of my new accelerator, it is most important to state that my old and valued friend, the late Andrew Ross, told Mr. Talbot how first of all by means of the solar microscope I threw the image of the object on prepared paper, and then, while the paper was yet wet, washed it over with the infusion of galls, when a sufficiently dense negative was quickly obtained. In the celebrated trial, "Talbot *versus* Laroche," Mr. Talbot, in his cross-examination and in an almost breathless court, acknowledged that he had received this information from Ross, and from that moment it became the unavoidable impression that he was scarcely justified in taking out a patent for applying my accelerator to any *known* photogenic paper.

The three known papers were those impregnated with the nitrate, the chloride, and the iodide of silver—the two former used by Wedgwood and Young, and the latter by Davy. It is true that Talbot says of the iodide of silver that it is quite insensitive to light, and so it is as he makes it; but when he reduces it to the condition described by Davy, viz., affected by the presence of a little free nitrate of silver, then he must acknowledge, with Davy, that "it is far more sensitive to the action of light than either the nitrate or the muriate, and is evidently a distinct compound." In this state also the infusion of galls or gallic acid is, as we all know, most decided and instantaneous, and so I found it to be in my early experiments. Of course I tried the effect of my accelerator on many salts of silver, but especially upon the iodide, in consequence of my knowledge of Davy's papers on iodine in the *Philosophical Transactions*. These I had previously studied, in conjunction with my chemical friend, Mr. Hodgson, then of Apothecaries' Hall. I did not, however, use iodised paper, which is well described by Talbot in the *Philosophical Magazine* for March, 1838, as a *substitute* for other sensitive papers, but only as one among many experiments alluded to in my letter to Mr. Brayley.

My pictures were exhibited at the Royal Society, and also at Lord Northampton's, at his lordship's request, in April, 1839, when Mr. Talbot also exhibited his. In my letter to Mr. Brayley I did not describe iodised pictures, and, therefore, it was held that exhibition in the absence of description left the process legally unknown. Mr. Talbot consequently felt justified in taking out a patent for uniting my *known*

accelerator with Davy's *known* sensitive silver compound, adopting my method (already communicated to him) with reference to Wedgwood's papers, and adding specific improvements in manipulation. Whatever varied opinion may consequently be formed as to the defence of the patent in court, there can be but one as to the skill of the patentee.

It is obvious that, in the process as conducted by me with the solar microscope, I was virtually *within my camera*, standing between the object and the prepared paper. Hence the exciting and developing processes were conducted under *one operation* (subsequently patented by Talbot), and the fact of a latent image being brought out was not forced upon my attention. I did, however, perceive this phenomenon upon one occasion, after I had been suddenly called away, when taking an impression of the *Trientalis Europœa*—and surprised enough I was, and stood in astonishment to look at it. But with all this, I was only, as the Judge said, "*very hot.*" I did not realise the *master fact* that the latent image which had been developed was the basis of photographic manipulation. The merit of this discovery is Talbot's, and his only, and I honour him greatly for his skill and earlier discernment. I was indeed myself fully aware that the image *darkened* under the influence of my sensitiser, while I placed my hand before the lens of the instrument to stop out the light; and my *solar mezzotint*, as I then termed it, was *in fact* brought out and perfected under my own eye *by the agency of gallic acid* in the infusion, rather than by the influence of direct solar action. But the notion of developing a latent image in these microscopic photographs never crossed my mind, even after I had witnessed such development in the *Trientalis Europœa*. My original notion was that the infusion of galls, added to the wet chloride or nitrate paper while the picture was thrown upon it, produced only a new and highly-sensitive compound; whereas, by its peculiar and continuous action after the first impact of light on the now sensitive paper, I was also, as Talbot has shown, employing its property of development as well as of excitement. My ignorance of its properties was no bar to its action. However, *I threw the ball*, and Talbot caught it, and no one can be more willing than myself to acknowledge our obligations to this distinguished photographer. He compelled the world to listen to him, and he had something worth hearing to communicate; and it is a sufficient return to me that he publicly acknowledged his obligation to me, with reference to what Sir David Brewster calls "an *essential* part of his patent" (*vide North British Review*, No. 14, Article—"Photography").

Talbot did not patent any valuable fixer. Here I had the advantage of having published my use of hyposulphite of soda which Mr. Hodgson made for me in 1837, when London did not contain an ounce of it for sale. The early operators had no fixer. That was *their fix*; and, so far as any record exists, they got no further in this direction than "imagining some experiments on this subject." I tried ammonia, but it acted too energetically on the picture itself to be available for the purpose. It led me, however, to the ammonio-nitrate process of printing positives, a description of which process (though patented by Talbot in 1843) I sent to a photographic brother in 1839, and a quotation from my letter of that date has already appeared in one of my communications to *Notes and Queries*. On examining Brande's *Chemistry*, under the hope of still finding the desired solvent which should have a greater affinity for the simple silver compound on the uncoloured part of the picture than for the portion blackened by light, I happened to see it stated, on Sir John Herschel's authority, that hyposulphite of soda dissolves chloride of silver. I need not now say that I used this fixer with success. The world, however, would not have been long without it; for, when Sir John himself became a photographer in the following year, he first of all used hyposulphite of ammonia, and then permanently fell back upon the properties of his other compound. Two of my solar microscope negatives taken in 1837, and exhibited with several others by Mr. Brayley in 1839, as illustrations of my letter and of his lecture at the City of London Institution, are now in the possession of the London Photographic Society. They are, no doubt, the earliest examples of the agency of two chemical compounds which will be co-existent with photography itself, viz., gallate of silver and hyposulphite of soda; and my use of them, as above described, will sanction my claim to be the first to take paper pictures rapidly and to fix them permanently.

Such is a short account of my contribution to this interesting branch of science, and in the pleasure of the discovery I have a sufficient reward.

I have thus written with perfect freedom to a fellow-townsman, and *at his request*, otherwise I should not have troubled the world with my story.

I now place it in your hands, and remain, my dear Sir,

Very truly yours,

Lyndon Smith, Esq. J. B. READE.

From Lyndon Smith, Esq., to the Rev. J. B. Reade.

Leeds, Dec. 23rd, 1859.

Dear Sir,—I am really very much indebted and obliged to you for your kind letter containing so much valuable and useful information, and feel ashamed to have put you to so much trouble; but this only convinces me that your attachment to art and science must be strong indeed to induce you to go so much out of the way at the request of a stranger. I am now quite satisfied that your claims to be considered the *first* photographer are most abundantly proved, and I shall not have the slightest hesitation in expressing the same in my lecture; and I am sure it will be as great a pleasure to my audience to know that a townsman holds so distinguished a place amongst the pioneers of the art as it is to myself.

Believe me, dear Sir,

Yours, most truly,

Rev. J. B. Reade. LYNDON SMITH.

From Lyndon Smith, Esq., to George Shadbolt.

Leeds, Feb. 19th, 1862.

Dear Sir,—I received your note this morning relative to some correspondence (between the Rev. J. B. Reade and myself) at a time when I was preparing a lecture on photography for the Mechanics' Institute here, and which, it appears, you wish to publish. As far as my share goes you are quite at liberty to publish what you think fit; though, as my letters were penned "off-hand," there may be inaccuracies or strong expressions which may require correcting. I have forwarded you by post the long and interesting letters of Mr. Reade, which give an admirable exposition of his early experiments; and I must say that my opinion, formed at the time of the correspondence, is still unchanged—that he is really the inventor of the calotype process, and that he has certainly not received the credit due to him. * * * *

Believe me, dear Sir, yours truly,

G. Shadbolt, Esq. LYNDON SMITH.

From the Rev. J. B. Reade to George Shadbolt.

Ellesbro' Rectory, Tring, Feb. 24, 1862.

My dear Sir,—I return your proof slip with a few corrections; and I have added, in justice to Talbot, a distinct answer to the question from Mr. Smith as to my "substitution" of iodide of silver for that of chloride. I did not propose such substitution, because I worked much better with the other papers. I now know that the real cause of my failure was the too great strength of the infusion of galls I used with it. In point of fact the same objection applies to Talbot's patent *as specified*. His sensitising solution of gallic acid is found by subsequent and improved practice to be nine or ten times too strong; and it produces, therefore, such an unstable equilibrium as to cause the surface of the paper when exposed in the camera to be generally decomposed before a picture can properly be taken.

Also, under the patented directions for *iodising the paper*, so large an excess of iodide of potassium remains in it that the subsequent addition of the gallo-nitrate forms only a larger quantity of iodide of silver, instead of producing the sensitiveness aimed at. The specification, therefore, fails as a *working process*. I occasionally succeeded pretty well with iodide of silver formed on glazed cards, because in this case I used acetic acid to expel carbonic acid from the white lead, and this acid, as we have since learnt, retarded the action of the accelerator; but I knew nothing of the *reason* in those early days.

I often took very pretty little impressions of *feathers* by the light and warmth of an argand lamp. The first camera picture which Ross saw was one of my greenhouse at Peckham, with the gardener standing outside; and at my request he made me a short-focus achromatic object-glass instead of the combination I was then using. In fact, the first achromatic camera was made for me. I have therefore done some little in the "pioneering line," as Lyndon Smith calls it; but I hope I shall not be accused of pushing myself unduly forward when I merely answer the questions of friends.—Believe me to be yours, very truly,

George Shadbolt, Esq. J. B. READE.

[We cannot forbear adding a few words to the preceding correspondence, which we think proves beyond question that photographers owe a debt of gratitude to the Rev. J. B. Reade, whose name in connexion with the earlier discoveries deserves to be "familiar in their mouths as household words." We trust that henceforth he may receive that meed of acknowledgment so justly his due.—Ed.]

HELIOCHROMY.*

By M. Niepce de St. Victor.

The principle upon which I base my experiments is that of M. Edmund Becquerel, into which I believe I have introduced an important modification which enables me to obtain, in the first place, more brilliant tints upon a white ground; then after obtaining the colours we can, by a second operation, temporarily fix them—that is to say, we can retard for several hours the distinctive action of light. Heliochromic colours are obtained on a film of chloride of silver formed on a metallic plate. We may chlorise the silver plate by various means: at present I employ for the purpose hypochlorite of potash. This alkaline bath, although very variable in composition, generally gives fine tints, only the ground of the image remains rather sombre even in spite of the operation of re-heating the plate, and furthermore, from various causes, certain colours predominate.

This chlorisation does not give results identical with those indicated by M. Becquerel in his *mémoire* of 3rd July, 1854. It is

* Presented to the Académié des Sciences.

t even better on the score of sensitiveness than that I employed the time when I reproduced the colours of a doll. The bath hich I used at that time was composed of half sulphate of copper, d half proto- and deuto-chloride of iron, dried and diluted with a nth part of water. After this chlorisation, which had undergone e action of re-heating, we can operate with sunlight in a quarter an hour in the camera.

We know that, in order to obtain colours on a white ground, it is cessary, before exposing the plate to the light, to heat it until e chloride of silver assumes a rose colour, or to replace the action heat by that of light under a compound screen, as indicated by Becquerel in his *mémoire* already cited. I conceived the idea of ating the chlorised plate, before its exposure to light, with a film med of a saturated solution of chloride of lead, obtained directly m the metal, with which is to be mixed a quantity of dextrine fficient to form it into a varnish of a certain consistence. The rnish is allowed to remain on for twenty-four hours, and it is en poured off for use again, after several days. This varnish is read over the entire surface of the plate. After it has been subtted to the re heating it is drained off at one of the angles, and e plate is dried over a spirit lamp; then the plate is ready for posure to light.

The colours appear under the influence of light with much greater ensity than when the plate is not covered with the varnish—as y be observed by varnishing only one-half of the plate. The ound of the varnished part is white because the chloride of lead s the property of whitening chloride of silver under the action of ht (especially if the chloride of silver has been heated), and the ours are better brought out; and, what is more (and this is traordinary), the blacks of an engraving are often reproduced th great intensity. The same phenomenon occurs sometimes on a e-coloured plate before exposure to light.

After obtaining the colour the plate is heated over a spirit lamp, sing the temperature carefully as high as possible without rching the varnish, which sometimes happens very quickly on e parts upon which white light impinges directly, especially if e chloride of lead be too acid or too concentrated.

Under the influence of heat the colours are seen to acquire nerally more intensity, particularly if the light has affected the ire thickness of the film of chloride of silver: in the opposite e, heat turns the blues to violet and the blacks to red, but this ult seems to me very remarkable. It is by this action of heat o the varnish, influenced by light, that we obtain the temporary ity of the heliochromic colours.

If we apply the chloride of lead varnish after obtaining the ours, they are enlivened, but they are preserved for a much rter time than when the varnish is applied before obtaining m; their production is not however retarded.

Generally all substances applied as a varnish on the film of oride of silver, whether before or after obtaining the colours, ken under the light the whites of these impressions; whilst all e salts of lead (and above all the chloride) whiten them. It is uisite to avoid using the chloride of lead too concentrated, as that case it produces too much white chloride.

Several substances—as, for example, sulphate and nitrate of per applied with dextrine on the film of chloride of silver before e exposure to light—enliven and make certain colours predomie; but none fix them for so long a time as the salts of lead, e chloride in particular.

I hope, at length, with this varnish containing chloride of lead be able to suppress almost entirely the re-heating operation at times when the plate has been chlorised, whether by the galnic pile or in an acid bath, such as that above indicated; but in e alkaline bath that I have employed in these later experiments is needful to give a slight re-heating to the plate before applying e varnish. If the plate be entirely brought back to the rose tint e colours are more rapidly produced, the lights are white, but e tones are generally less brilliant; on the other hand, their fixity greater.

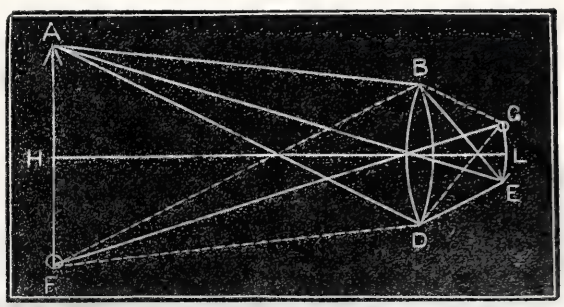
Summary.—1stly. Chloride of lead applied upon the film of oride of silver before exposure to light produces in part the ect of re-heating—that is to say, that white light whitens the hts, and permits the acquisition of much more lively tints than en the plate is brought to the rose tint by heat alone.—2ndly. e action of heat after that of light produces in the chloride of ver protected by the varnish containing chloride of lead a temrary fixation of the heliochromic colours.—3rdly. White light itens chloride of silver in contact with chloride of lead instead turning it to a violet tint, as would be the case were it alone. 4thly. The destructive action of light is retarded: it acts more slowly, since it requires ten to twelve hours of diffused light to destroy the colour, which it ordinarily does in a few minutes, though this is but a relative permanency.—5thly. Such is the condition of heliochromy at present, if the problem of fixation be not yet resolved, one may at least fairly hope that it will be so some day.

OPTICAL LAWS INVOLVED IN THE CONSTRUCTION OF PHOTOGRAPHIC LENSES.*

By W. K Wason.

Advantage of Short Focus.—If the lens in *fig.* 4 (which is reproduced below) had been thicker in proportion to its length, it would have refracted the rays of light more powerfully: the points A H and F would have had their conjugate foci E L and G nearer to the lens, and therefore a smaller image of the arrow would have been formed. This shortness of focus and consequent smallness of image causes the lens to work more rapidly, as may easily be seen. When the image produced is large, the light from the object is spread over a great surface, and therefore the actinic power at any given point is small; when the same light is concentrated on a small surface the actinic action is powerful, and therefore a picture is produced in less time.

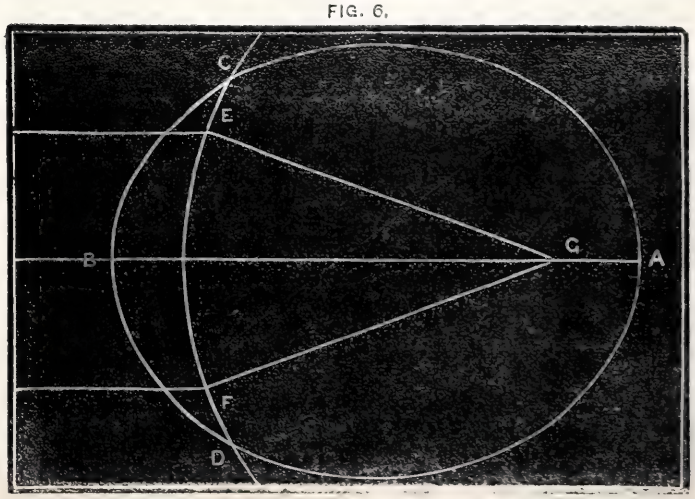
FIG. 4.



Spherical Aberration.—The lens B D, *fig.* 4, has (as given above), for photographic purposes, two defects. These two defects are often confounded with each other, under the same name—"spherical aberration"—although they are quite different both in cause and effect. I have already stated that all the rays from A that fall upon the lens B D (*fig.* 4) are brought to a focus in the point E. But this is not quite correct: it is found by experiment that the rays which fall towards the circumference of the lens have their focus at a point nearer to the lens than the point E, and the rays which pass through the lens near its centre have their focus more distant than E.

Now this defect might be got rid of if we could obtain a lens which would refract more powerfully towards its centre and less so nearer its circumference: the point L would be drawn nearer the lens, and the points G and E carried further from it. This greater refractive power must be obtained by increasing the curvature of the lens at the centre. Now the ellipse furnishes us with such a curve as we require. We therefore make the outer curve of our lens elliptical (*fig.* 6), and such, that the rays of light (if they do not suffer

FIG. 6.



a second refraction at the inner surface of the lens) may be refracted to G, the further focus of the ellipse. To hinder the rays

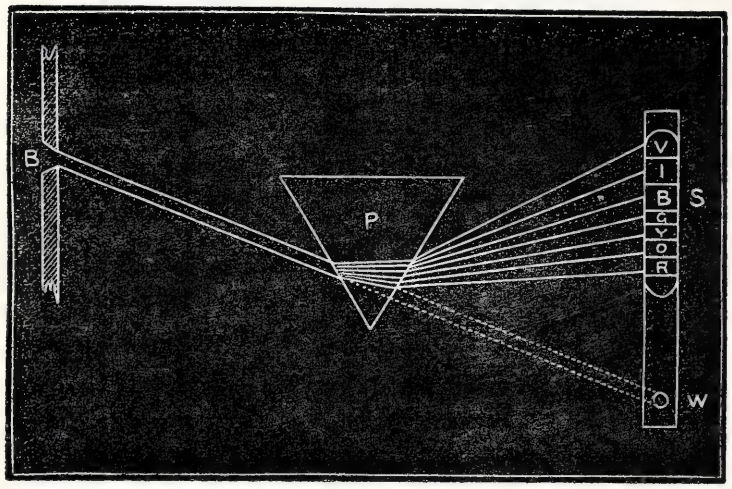
* Concluded from page 42.

from being refracted on leaving the lens, the inner surface is part of a circle drawn from centre G with any length of radius. The rays of light will meet this inner surface at right angles, and will therefore suffer no refraction on leaving the lens, but proceed direct to G. Thus a single lens may be formed capable of destroying spherical aberration; but, from the difficulty of grinding an elliptical lens, a combination of two lenses is generally used for the purpose.*

The second defect will be observed by again referring to fig. 4, where the image of the arrow is seen to be curved. This curvature of the image is sometimes erroneously called "spherical aberration," but its proper designation is "curvature of the field." The cause of this curvature is easily understood. The point A (being nearer the lens than the top and bottom of the arrow) will have its conjugate focus L at a greater distance from the lens than the points E and G. Now it is clear that this cannot give a distinct image on the flat glass which photographers generally use. If they focus for the centre, the outside will be out of focus; or if they focus for the sides, the centre will be out. Now I find it stated in some works of high standing in photography† that the lens I have just described will destroy curvature of the field, I fear however that such a statement is erroneous; we must therefore depend on a combination of lenses for overcoming curvature of the field.

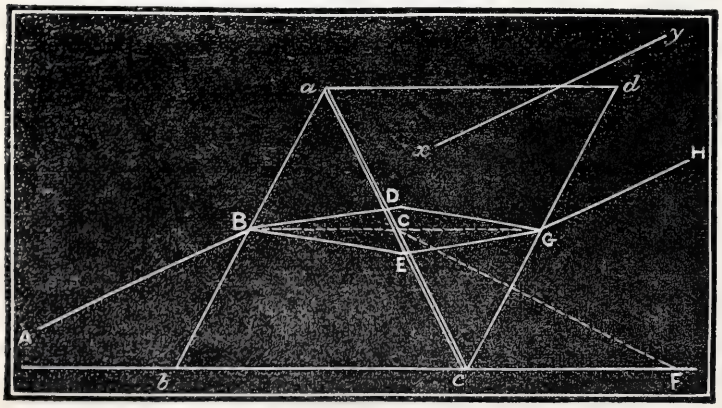
Physical Optics.—Every person is so well acquainted with the solar spectrum that I need scarcely say anything about it. By means of a prism P a beam of light B is broken up into rays of seven different colours, viz., violet, indigo, blue, green, yellow, orange, and red. Now, instead of trying to trace all the seven rays in their

FIG. 7.



passage through lenses we shall find it much clearer to fix our attention principally on the two extreme ones, knowing that the others will be found somewhere between these. Observe then that the ray which is most bent out of its original course is the violet V, and the one which is the least bent is the red R. Now this breaking up of the rays of light takes place in their passage through lenses as well as in their passage through prisms, and must be corrected, or the lens will be thereby rendered comparatively useless.

FIG. 8.



* The author is apparently misinformed relative to the supposed difficulty of grinding an elliptical lens. The real cause of its neglect consists in the fact that an *oblique* pencil of rays passed through such a lens would *not* be corrected for spherical aberration, and oblique pencils are precisely those most in use by the photographer.—Ed.

† See article *Photography* in "Orr's Circle of the Sciences," page 24.

Now let us see how one lens or one prism may be made to correct this breaking up of the rays (or *dispersion* as it is called) of another lens or of another prism. Let the beam of light A B fall upon the prism, *a b c*; and by the law of refraction we expect it to be bent to C. True, the centre of the beam of light will pass along the dotted line B C, but the red rays, as they suffer least refraction, will be bent to D, and the more easily refracted violet rays will be found at E. Here again the rays in passing out of the prism suffer a second refraction, and while the centre rays come to F the red and violet rays will fall, the one outside and the other inside the point F. If another prism *a c d*, made of the same material and of the same form as *a b c*, be now placed as in the diagram, the dispersion caused by the first prism will be corrected. The mean ray B C, after reaching C, instead of being bent to F will continue its course to G; the red and violet rays will both be bent up and down to G, and all the rays again meeting at the point G will there form white light, and be refracted as such in the direction G H. But G H is parallel to *x y*, the direction in which A B was proceeding before it met the prism. We have therefore gained no advantage by using those two prisms of the same form and of the same material. But if instead of making both prisms of the same material and of the same form, we make the first prism of crown glass, and the second of a smaller angle and of flint glass, the dispersion may be overcome and part of the refraction retained. Flint glass refracts more than crown glass, that is, the whole of the rays are more bent out of their course when they fall upon flint glass than when they fall upon crown glass. Flint glass also produces a larger spectrum than crown glass. Flint glass has therefore greater refractive and greater dispersive power than crown glass; but the dispersive power is greater in proportion than the refractive power, and therefore a thin prism of flint glass, while it is able to overcome the dispersive power of a thicker prism of crown glass, will not destroy all the refraction. Rays of light falling, therefore, on such a combination of prisms will emerge colourless, but bent out of their course.

The image thus produced is not perfectly free from colour, but is found to be tinged with purple on the one side and green on the other. This is called the "secondary spectrum," and is evidently caused by the coloured spaces in the spectra of crown and flint glass not being respectively equal to each other. To get rid of this secondary spectrum some opticians employ a third lens; hence we hear of triple achromatic combinations. But it then becomes a question whether the loss of light by absorption, when using such compound lenses, will not counterbalance any advantages derived from having a completely achromatic combination.

THE TANNIN PROCESS.*

By Major Russell.

CHAPTER V.

[*By the special permission of the Author we reproduce the following.*]

Up to this point there is no risk of failure if the foregoing directions are carried out with the ordinary attention to cleanliness necessary in all processes; and except in those matters on which especial stress has been laid, great latitude of treatment is admissible. In the exposure and development, however, great care and experience are required to ensure the best results. With regard to the time of exposure, much difference will be found in the sensitiveness of the plates, according to the mode of preparation. The principal causes of insensitiveness have been already given: they are the use of a simply iodised collodion, or of an old sample, or of a bath much more acid than is required to keep the pictures bright. Should two, or all, of these unfavourable conditions be combined, the insensitiveness will be very great. The use of an alkaline, neutral, or insufficiently acid bath, with a nearly or quite colourless collodion, will also produce insensitiveness to half-tones as well as fogging. The writer has prepared plates by the method given in the preceding pages more sensitive than those he can produce by any other dry process with which he is acquainted, consistently with obtaining vigour and brightness, and he believes that this process will be found to give brilliant and vigorous results, combined with softness and good half-tones, with greater facility and certainty than any other process when the subject is feebly lighted.

The observance of a few simple precautions will ensure good results, whatever be the light or the nature of the subject; but the same qualities which are favourable in the case of a badly-lighted subject make more care necessary to produce the very best results

* Continued from page 27.

when the subject is well lighted and contains great contrast, such as dark foliage at a short distance and sky.*

Could we always ensure the exact accuracy of the time of exposure it would be easy to give a formula for a developing mixture which would always succeed with any given kind of subject. In the case of dry plates this is impossible, as the time of exposure must always be more or less uncertain, unless, as in the wet process, each plate be immediately developed, and so the proper time of exposure be ascertained for the next. In the ordinary way of working all that can be done is to give general rules, and to indicate the effects of different modes of treatment, which, to produce the best results, must be slightly varied in almost every case. The following formulæ will be found to produce developing fluids suitable for this or any other process.†

(1.) Pyrogallic acid ..... 96 grains.
Absolute alcohol ..... 1 ounce.

Pour the alcohol, which should be anhydrous, or at all events as strong as can be obtained, into a two-ounce bottle with a good flat rim. If the bottle be full it will be difficult to pour without waste. Add the pyrogallic acid, which will dissolve immediately; shake up to equalise the strength of the solution, and add two or three drops of ether (this is not necessary). The solution will scarcely alter in colour in six months, and its use is much more convenient than constant weighing out. Treated in this way the pyrogallic acid will contain its full strength, which is not the case when it is dissolved in water, or even in strong acetic acid. Five minims of the solution contain one grain of pyrogallic. If it is to be used for wet collodion, measure the required quantity, dilute to the proper strength, and add the required quantity of acid.

(2.) Nitrate of silver ..... 10 grains,
Citric acid ..... 10 to 60 „
according to the strength of the tannin solution, heat of the weather, nature of the subject, &c.
Distilled water ... . 1 ounce.

The advantages gained by using the acid in the silver instead of in the pyrogallic solution are very great. When the plate is rather under-exposed, and only a little silver is required with strong pyrogallic, the half-tones come out much better than when, as in the common method, a large quantity of acid is present. On the other hand, when the plate is over-exposed, a strong solution of acidified silver can be used with a small quantity of pyrogallic without causing turbidity in the liquid, or throwing down any gross irregular deposit likely to injure the details of the picture. This acid solution of silver will be found exceedingly useful to add to the developer in the wet process, when, from the nature of the collodion or the feebleness of the light, the image comes out perfect in detail but of insufficient intensity; or it may be used with pyrogallic to intensify negatives developed with iron. If, as is the usual practice, plain nitrate solution be added to the developer—unless the amount of acid has been unnecessarily large for the first stage of the development—the least addition of the nitrate causes immediate turbidity, and a muddy deposit falls at every part of the film: not only so, but the silver itself is thrown down in a coarse granular state, giving less density and destroying all delicacy of detail. No such effects follow the addition of nitrate of silver accompanied by a sufficient proportion of acid.

The development of plates prepared with tannin may be made at least as rapid as in the wet process by using a strong developer at once; but this mode of proceeding is not advisable in the case of negatives, as it determines the character of the picture so rapidly that if much over or under exposed it will be entirely spoiled. In all cases this treatment prevents the attainment of the best possible results, except by accident. The following method of development will be found preferable, and, if conducted with care and skill, will allow of great latitude in the time of exposure:—

For a stereoscopic plate allow one drop of (1) to fall into a glass measure, holding the stopper against the lip to prevent the liquid from creeping down the outside of the bottle; pour two or three drachms of distilled water into the same measure; then filter through paper in a small gutta-percha funnel into the glass which is to be used in developing. Pyrogallic solution should always be filtered, especially when used soon after being made or diluted; otherwise any particles of insoluble matter in the solution, however small, if of a porous nature, will cause "comets" on the negative from being more strongly imbued with pyrogallic acid than the fluid which surrounds them.

Pour a few drachms of (2) into another filter of the same kind, which, with a glass measure, should be kept ready for the purpose. The above-mentioned funnels and glass measures, excepting the one used in developing, never need be washed nor the papers changed until they filter too slowly. These filterings may be conveniently managed as follows:—Cut a square piece of thin board, such as a piece of a cigar box, a little larger than the top of the glass measure: make a hole in the middle, of such size that the nose of the funnel will go through about an inch, or more, according to the size of the funnel, and push in with sufficient force to make the wood adhere firmly. The funnel can now be lifted with its support from one measure to another; and, should it be required to move the glass while filtering, a finger placed on the wood will keep the funnel in its place. When silver is to be added to the developer lift the funnel, pour a little of the solution into it, and hold over the developing glass, counting the drops to regulate the quantity added. The fluid having been before filtered through, will ensure its being clean.

A still easier way of adding the silver is to place the funnel in the retort holder, the nose being an inch or so above the top of the glass measure. When any of the solution is required, with the right hand pour a little of what has been filtered into the funnel, and hold the developing glass under with the left till the required quantity has dropped, when the other glass takes its place again. This is as easy a way as any of adding small quantities of silver; but, if preferred, the solution may be dropped direct from the bottle. In the absence of a retort stand, a piece of thin board having a hole to receive the funnel will do as well, if laid on a box of the right height, with some heavy object on it to keep it in its place.

Whilst the solutions are filtering, take the plate which is to be developed and moisten it in this manner:—Lay it on a levelling stand and pour distilled water along the nearest edge of the glass; spread carefully over the surface with a perfectly clean glass rod (bent at one end, and a little longer than the width of the glass), taking care not to touch the film except at the edges, and not to let the end of the rod project beyond the edge of the plate, as this would lead the water over the side: should this happen, remove the water from the back of the plate with blotting-paper. The extreme corner or corners which are to be handled should be left dry: this will keep the fingers and also the negative clean. Let the water remain until the film is thoroughly penetrated, which is known by its being equally whitened. This will take from two to four minutes: the more quickly the water has been spread the less time will it require to remain. The water should not be left very long on the plate, as, when gelatine of insufficient strength has been used to hold thick collodion, an hour's soaking in water may loosen the film, even although the developer would have no such effect.

Should it be preferred, the plate may be moistened by dipping it in a bath of distilled or common water. In this case, after a few seconds' immersion, lift it out of the water and allow it to drain on the dipper until the upper corners are nearly or quite surface dry, otherwise water which has touched the fingers may flow on the sensitive surface, and produce a mark of non-development; or, to be quite safe, the corners to be handled may be touched with negative varnish before the plate is dipped. After moistening by dipping, wipe the back of the glass to prevent water flowing from the points of the stand into the developing glass.

When the plate is moistened, mix by stirring one drop of the silver solution with the dilute pyrogallic; pour off the water, but not too closely, or the edges may become surface dry. The tannin remaining does no injury. Pour the mixture on the right-hand end of the plate, and incline the latter so as to drive off all the moisture before the developer into the glass. The same method of pouring must be repeated after every addition of pyrogallic or silver, to avoid producing unequal intensity. Pour on again at the other end of the plate, and repeat the pouring on and off several times, watching as the image appears. If any part come out more slowly than the rest from the imperfect mixture of the developer with the water previously on the plate, pour afresh over that place two or three times, that the whole may start nearly simultaneously. If nothing appear in three or four minutes add more pyrogallic. This should be filtered by dropping on the filter and washing through with a little water; or it may be measured in a minim glass

* The writer has not yet found time to investigate thoroughly the conditions and treatment which give the very best kind of pictures with the last-mentioned kind of objects, but believes that they can be obtained by this process of as good a quality as by any other, judging by the specimens which he has already produced, and by the great power we have of regulating the quality of the negatives by the use of different collodions and solutions of tannin varying in strength, and by the time of exposure and the nature of the developer.

† Albumen and collodio-albumen plates will require in (2) the substitution of acetic for citric acid, which, being a solvent of albumen, is apt to cause blisters. The acetic acid must be in large enough proportion to prevent turbidity in the developer, and the solution should be used direct from the bottle, to avoid loss of acid by evaporation.

and poured on the filter, the measure being then rinsed with a little water, which is afterwards to be also poured on the filter. View the image carefully by transmitted light every time the developer is poured off: on looking through it the proper treatment will soon be seen; but it is of great importance not to add pyrogallic too fast, as, should the plate be over-exposed, such a proceeding will establish the character of the picture too quickly to admit of control. Should there appear too much contrast and deficiency of half-tone from under-exposure, add the slightly diluted and filtered pyrogallic drop by drop, watching the effect; if, on the other hand, the image appear quickly and is full of detail, but looks flat from want of contrast, add more acid silver in the same way. For a third case the film, from great over-exposure, may begin immediately to redden all over, showing the image but faintly: if so, pour away the developer and replace with a few drops of acid silver diluted with water. In such a case the small trace of pyrogallic left on the film will be quite sufficient to complete the development, when silver enough has been added. If the image show about the right amount of contrast, and the half-tones begin to appear at the proper time, the pyrogallic and silver solutions may be added together; and if at any stage of the development too much of either solution has been inadvertently used, the developer must be instantly poured away and replaced by a fresh mixture made in the correct proportions.

The developer first used will sometimes become turbid, especially when strong pyrogallic has been applied with very little silver, previously to the appearance of the image. When the plate has been under-exposed, however, the pyrogallic should not be added too late, or the character of the picture will have become established, and the half-tones will not admit of development. Experience is the only guide as to the right time to add pyrogallic in any particular case. Should the slightest turbidity appear, reject the old solution as soon as the image is sufficiently out to show what kind of developer is required: a fresh quantity mixed in the proper proportions will be pretty sure to go right without the precaution of washing the plate and developing glass. The fluid will become more and more dark-coloured with each fresh addition of silver, probably until it is as dark as port wine, but it ought to remain all the while bright and clear.

This mode of developing admits of either or both solutions being dropped into the empty glass while the developer is on the plate, and the latter may then be poured in without any bad effect. Should several plates have been exposed similarly, the subjects being also similar, three plates, especially if small, may be developed at the same time; but, in case they should require different treatment, two extra clean measures should be ready, so that each plate may, if necessary, have a separate developer. The method of development above described is purposely made slow at first; but, as soon as the kind of developer required is indicated, it may be finished more rapidly, by strengthening with such proportions of the solutions as experience shows to be needed in any particular case.*

The only failure which the writer at first experienced with tannin was that of blurring, or encroachment of the sky or highest lights on the more transparent parts of the negative as a halo or red stain. This, when it once appears, prevents all half-tone from coming out in the parts affected, farther pushing of the development only deepening the stain. This cause of failure depends on the development, and is scarcely at all affected by the state of the bath or collodion. After every thing but the right one had been tried, it was found that this annoyance could be prevented with certainty, even where there had been great over-action of light, by very simple means—that of using more acid in the silver developing solution. No one proportion can be given as suitable in all cases; but the following rule will be found to be practically sufficient:—The minimum quantity of citric acid used with each grain of nitrate of silver should be about one grain of acid for every ten grains of tannin contained in one ounce of its solution. It will scarcely be found advisable to use so small a proportion as this for landscapes containing sky, or other kinds of subjects containing great contrast of light and shade, or for any subject in very hot weather, as in these cases more acid is necessary than would otherwise be required. The best guide is the appearance of the finished negative. The slightest trace of the above-described blurring is a proof that not nearly enough acid has been used.† Again, on looking along the surface when dry, at a small angle towards the light, the whole should be as bright as glass; and dulness on the transparent parts least affected by light, if at all marked, is another indication of the same fault in the developer, except in the case of an under-exposed negative much pushed in the development with the strong pyrogallic and little silver: in this case we may expect a slight deposit, even though a proportion of acid sufficient for properly-exposed plates may have been used. Under these circumstances, a more highly acid solution than would otherwise be required may be used for the first stage of development, or, if it be thought desirable, a few drops of a ten-grain solution of citric acid, or a little acetic acid, may be added with the first drop of acid silver. When the half-tones are out, no more acid will be required to intensify than in ordinary cases. It will be found convenient to keep ready several bottles containing silver solution of different degrees of acidity, from one and a-half or two grains to four or more grains of citric acid to the grain of silver.

Each bottle should have its own filter and glass measure. The acid silver solution appears to keep well: a horny, semi-transparent substance is sometimes formed in the liquid, but the action which produces this effect does not seem to alter perceptibly the quality of the solution. In determining the proportion of acid to be used, it should be borne in mind that too much is far less injurious than too little. Four grains of acid to one of nitrate will give excellent results on plates prepared with tannin solution fifteen grains to the ounce; although this quantity is much greater than is usually required. No fear need be entertained that a large proportion of acid will prevent the half-tones coming out; for, if the proportion of silver in the developer be kept low till the half-tones appear, much less acid is present at this stage, even with a very acid solution, than in the ordinary method. The only injurious effect of an unnecessarily large proportion of acid will be a slightly colder tone of colour, which is of no consequence in a negative.

The power of regulating the result by the above mode of developing is so great that, when assisted by the peculiar properties of tannin, it enables us to produce a good picture with almost any collodion.

If the right exposure, within the necessary limits, has been given, and the development properly managed, the finished negative will resemble a good one produced by the wet collodion process; but the definition, as in the albumen process, may be expected to be more perfect from the impression being taken on a smooth and polished surface instead of on an expanded and spongy substance with a somewhat irregular surface, which is afterwards contracted and rendered smooth by drying. The greater part of the film will appear by reflected light of a yellowish brown colour—except the sky and high lights, which will be dark, and the deepest shadows, which will be transparent, and will appear black when a dark object is held behind the plate. In ordinary subjects, however, this transparent appearance should be confined to a few touches. On looking through the plate the picture will be bright and vigorous, but soft and full of half-tone; and should the sky or high lights be solarised, they will be of a deep purplish red, which stops light in printing much better than the pale solarisation often produced in other processes. The parts which appear quite black and opaque when examined by diffused light, will be found to be really translucent when placed close to the flame of a candle or lamp. The blackest parts, when looked through in this way, will resemble very dark, transparent stains in the glass, without a trace of granulation, and showing all the detail. The kind of negative described above can only be produced by the wet process when the collodion and bath are in good order; but plates prepared with tannin, being much less dependent on the state of the collodion and bath, will give results of the above kind with much greater certainty.*

No other process can be less liable to fogging and stains than this one, the former never appearing unless the bath be alkaline or insufficiently acid, or unless the light has got access to the plate; while the latter, if the nitrate be entirely removed, can scarcely be produced by any treatment short of splashing impurities on the film.

It is of great importance to have the developing glass and glass rod used to guide the flow of the developer from the measure to the plate thoroughly clean before commencing. For this purpose, make a solution of about twenty grains of any soluble iodide to the ounce of water, with as much iodine as will dissolve. The exact strength is of no consequence, but the solution should be of a deep port wine colour. Keep about a pint of this in a bottle; and,

* When the proportion of silver is very small, the developer may be left at rest on the plate for a long time; but, when much silver is present, this treatment will cause mottled markings to appear, if such exist in the texture of the collodion film.

† Unless gallic and pyrogallic acids have both been used on the same plate. This treatment will always produce the fault in question when the subject presents much contrast and a strong solution of tannin has been used, though the silver solution may be acid enough for use with pyrogallic alone.

* The details in the shadows of a tannin negative should all be faintly visible, even if, from under-exposure, they cannot be made intense enough to print.

after developing, fill the glass containing the rod with the liquid, pour into another glass of the same size, and immerse the edge or lip to clean it outside and inside, and then return the solution to the bottle. The glasses may be now left till required for use, when they are to be rinsed with water, rubbing with the finger. The entire removal of any deposit which may be present is of no consequence, as the silver is now converted into iodide in the inert state, and exercises no greater effect than is produced by the film itself in the parts unaffected by light. This liquid is safer to use and more efficacious than nitric acid or cyanide, since when the latter are used any deposit not entirely removed will still affect the developer. The superior energy and penetration of the iodine solution may be proved by dipping the nose of a gutta-percha funnel, which from long use with nitrate solution has become stained with reduced silver, into nitric acid or cyanide solution. No very perceptible effect will be immediately produced; but, if it be dipped into the iodine solution, the deep stains will be quickly changed to a primrose colour. Stained gutta-percha trays may, with this solution, be so effectually purified in a few minutes, that paper negatives may be developed in them with the same cleanliness as in a new glass dish. Care must be taken not to allow the iodine and iodide to touch a sensitive plate. A trace of the fluid will do no harm in the glass which receives the mixed developer; but the glass measure and rod should, after cleaning with iodine, be well rinsed before being used to apply water to a plate preparatory to development. The cleaning solution will stain the skin when undiluted; but it may, nevertheless, be used to remove reduced silver from the fingers, as its application greatly facilitates the subsequent action of cyanide, which will then quickly remove both silver and iodine. A little iodide and iodine should be added to the solution when its paler colour shows that it has been weakened by long use.

Unless a very thin solution of gelatine has been used with a thick collodion, the film will show no tendency whatever to become loose during development. Should this fault appear, the negative will not be worth finishing, and in future stronger gelatine or thinner collodion must be used. There need be no risk of failure from this cause.

When the development is complete, wash till all oily appearance is removed; for, if the plates be placed in hyposulphite with oily markings upon them, these will be visible to some extent afterwards, in this or any other collodion process. The film, being amalgamated beneath with leather, is so strong that it cannot be injured by a heavy stream of water: even if purposely torn, the water will not penetrate between the film and the glass. Cyanide must not be used for fixing, as any alkaline liquid will loosen the film. The strength of the hyposulphite is of little consequence; but it need not be strong, as the fixing is more easy and rapid than in the case of other dry processes. Strong hyposulphite will not, however, produce much effect upon the intensity of the negative, if the collodion be of such a nature as to keep the image in the film and not on the surface.

In this, as in most other dry processes, the film will sometimes become slightly loosened in the final washing, especially when the gelatine has been too weak or the collodion old and powdery: a new collodion, giving a horny film, adheres more strongly when used on gelatine. Slight loosening at this stage seldom affects the negative when dry; but it may generally be prevented by adding a little tannin solution to the hyposulphite. This addition causes turbidity, and afterwards a red colour; but does not destroy the solvent power of the solution, nor does it appear to produce any injurious effect. Should the above-mentioned loosening occur through any mismanagement, it will be better, in the case of a good negative, to finish the washing by covering the plate with distilled water for some time on a levelling stand, to remove as far as possible any soluble matter under the film, otherwise such matter may show slightly when dry. After being washed, the plates are to be set up to dry on blotting-paper.

If any loose deposit appear on the surface of the film it may be removed, when quite dry, with a brush made of eider down, which is much less liable to injure the surface than cotton wool or the softest hair brush. Eider down is often to be found in coats, quilts, &c., which are lined or filled with it. To make a brush pick out the largest pieces singly, find in each the small quill by which it was attached to the skin, collect five or six, and form into a small brush by bringing the quills together and twisting this end round between the finger and thumb with a little solution of caoutchouc in turpentine, or other cement. Make a sufficient number of these small brushes to form a round ball of down about the size of a walnut. Bring the cemented ends together and insert in a fowl's quill, which has been cut off near the end and split in two or three places; then bind the quill round firmly with waxed thread. This brush ought not to be often required to remove loose deposit, but is always useful to clear off dust before varnishing, and if applied lightly will do no injury.

The film, if on gelatine, will never crack or split off on drying, nor has the writer seen an instance of its doing so when gelatine has been used, except when a very weak solution of tannin was employed in the vain hope of preventing the loosening of the film. If the collodion be unsuitable for this purpose, it will become wrinkled almost as much with three grains as if thirty grains to the ounce had been used, and in the former case the development is very feeble. Dispensing with the gelatine does not seem at all advisable, when, by its use, absolute security from all mechanical difficulty can be obtained at so little trouble. Before varnishing, dry the plates well by artificial heat, and varnish when sufficiently cooled. In most cases the cracking of negatives is caused by their being varnished while damp. After varnishing, keep the plates at a higher temperature than the sun can ever cause, until the varnish ceases to be soft and sticky at that heat, to prevent their adhering to the paper in printing.

PRACTICAL INSTRUCTIONS FOR GRINDING LENSES.*

We concluded our last article upon this subject when the first surface of the convex lens was supposed to have been brought to the correct figure after having been worked in the proper tool with several changes of emery, each successive sample being finer than that which preceded it, so that the surface of the glass has been gradually brought to present a very smooth, regular, grey appearance, when it is ready for the polishing. In order to effect this operation the lens and the tool have both to be carefully washed free from any trace of emery and dried. The tool is then heated, and a little common pitch is smeared lightly over the surface of the tool, and a piece of clean silk (of the species known as sarsenet) is to be pressed by the fingers into close contact with the inside of the tool, to which it is made to adhere by means of the pitch. When the silk adheres firmly and evenly all over the surface, the tool is set aside to become perfectly cold, in order to avoid loosening the silk when it comes in contact with the water used with the polishing material. When the tool lined with silk has become perfectly cold, a small quantity of putty-powder (peroxide of tin) is made into a thin paste with water and spread evenly all over the silk lining of the tool: the figured but unpolished lens is then worked therein by hand precisely in the same manner as in the grinding or "figuring" operation. The time occupied in polishing varies greatly—say from twenty minutes to three or four hours—and the variation is inversely as the time consumed in the grinding operation. Thus the more correct the figure and perfect the surface before polishing, the more rapidly can this operation be performed, and *vice versa*.

We may observe that lenses which will polish rapidly are generally more correct in performance than those which require a long time to effect the operation.

In opticians' workshops, where there are many lenses to be worked to the same curvature, there are usually duplicate and triplicate tools of precisely the same size and curvature, viz., one for the first rough grinding, one for the figuring, and one for the polishing operations. This is a simple matter of economy, because the enormous waste of labour that would be entailed by inserting and removing the silk every time it is required to polish a number of lenses and prepare for grinding others would far outweigh the extra cost of the additional sets of tools; but where only one or two lenses of any particular curve are required the case is entirely different, and the economical course is to expend the extra labour.

When there are tools kept expressly for polishing only, instead of using silk as above described another material is more frequently employed for the lining. It is a woollen fabric, called by the opticians "lapp," and is a species of thick cloth, appearing as if partially felted, of a whitish colour: it is known also as "dreadnought," and is the same as was used formerly to be employed for making the top coats of the old watchmen. This "lapp" is pressed into the metal tool in the same way as the silk, and is made to adhere to it in a similar manner; but, instead of using pitch for the purpose, the "pitch cement," described in our last article, is substituted. It takes more care and time to set in the "lapp" than is required for the silk, as it does not accommodate itself so readily to the form; but, when once properly adjusted, it is not liable to get

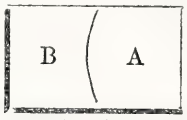
* Continued from page 59.

out of order. For the purpose of adjusting it to the proper curvature the corresponding tool for *concave* glasses of the same curvature is applied to it before the cement has hardened; and, by working this in a manner corresponding to that followed in grinding and polishing the lenses, the correctness of the figure is ensured. When the lens is polished it becomes necessary to detach it from the cement which has served as a hold for the fingers during the various operations which have been described; and this is effected by striking it a smart blow on the edge with a wooden mallet, when the glass immediately separates. It is needful to allow the cement to become quite cool before removing the lens, or portions of the cement are apt to adhere to it, and leave it in a dirty state. Should this mischance occur, the particles of cement are readily removeable by soaking the glass in spirits of turpentine.

It is obvious that the lens has to be subsequently wrought on the other side, whether that surface is to be convex, concave, or plane; and, as a preliminary proceeding, another lump of cement has to be attached to the curved side previously finished, and this is done in precisely the same way as in the first instance.

It is evident from what has already been described that it would not be possible to grind the lens to a true figure without the tool in which it is ground being true also; and it may now be proper to explain how the tools are made, and the method adopted in order to ensure accurate sphericity of surface.

Having determined the radius of curvature which it is desired to give to the tool a piece of flat thin brass is laid upon a table, and with a pair of compasses set to the desired radius an arc of a circle is marked upon the piece of brass. In case a piece of flat thin brass is not to hand, a piece of flattened tin plate may be substituted. It sometimes happens that we want a curve of longer radius than our compasses will reach: in this case, by means of a wooden rod, and a couple of stout needles placed in it at right angles to its length at the proper distance apart, the operator is enabled to strike the arcs required upon the piece of flat brass or tin plate. This is then to be cut accurately to the portion of the circle struck by the compasses or its substitute, and if the radius be not too long it may be cut, if preferred, in the lathe. It is necessary to use both the convex and concave pieces, as they require to be brought into correct form by working them with a curvilinear motion one against another, with a little emery or pumice-stone finely ground. The annexed diagram represents the piece of brass which is cut into the two gauges—the piece indicated by the letter A being used for the tool for convex, and B for that for concave lenses.



When the gauges are ready, the next proceeding is to procure a piece of wood of even texture, and such as will bear turning in a lathe: mahogany, beech, or box-wood answer very well for the purpose. The dimensions of the wood must of course depend upon the size of the tool to be made. This must be properly fixed by means of a chuck in a lathe, and the face carefully turned out until the gauge A fits the hollow space when placed therein, cutting the axis of motion up to the extreme edge of the cavity. The superfluous wood on the outer side may be turned off, and a boss be left or added at the back, upon which the screw will eventually have to be cut. When brought as closely to the desired form as possible, this wooden pattern must be taken to the metal caster, in order to have the form reproduced in either brass or iron. The former is most costly, but is more quickly brought into a true form: the latter is, of course, the cheaper, but takes more time to work.

Having procured the metal casting, the screw in the boss is first to be cut, and the embyro tool is then to be reversed in position by screwing it with the newly-cut screw into a chuck in the mandril of the lathe. The metal tool is then to be turned in the same manner as was directed for the wooden pattern, and from time to time tested with the gauge, until the cavity in the face of the tool fits the gauge accurately, when the latter cuts the axis of revolution.

When this is accomplished the still incomplete tool is to be removed from the lathe, and screwed on to the top of one of the posts described in the former part of this article, at p. 58, and melted lead is to be poured into the cavity, into which, *before becoming set*, a piece of wood, armed with a brass screw, may be inserted, to be used as a handle in the next operation.

When cold, the lead is to be lifted out of the tool and some emery and water placed in the hollow space: the lead is again to be inserted and worked over the face of the tool in the manner already described as employed for grinding the glass itself. This operation is to be continued until the face is perfectly true to figure, and it is known to have arrived at this stage when it presents a dark or nearly black colour all over.

A word or two of precaution may be added with regard to the emery used in grinding the glasses, which must be kept a little damp during the operation; and it is of importance that it should be pretty evenly damped all over the tool alike, otherwise it is apt to produce deep cuts and scratches all over the glass.

With regard to the emery it is necessary, at first, to purchase it ready sorted; but, when familiar with his work, the lens-grinder usually prepares it for himself. But the method of doing this we must leave for description in our next.

NOTES ON POSITIVE PRINTING.*

By E. Reynaud.

The important influence exercised by the circumstances under which printing takes place is well known to photographers. In fact, a negative which, under a certain set of circumstances, will yield a comparatively worthless and mediocre print, will, under more favourable though perhaps only slightly varied conditions, yield a proof in every degree satisfactory.

It is easy, therefore, to appreciate the value of researches which tend to determine the conditions suitable to the varying qualities of negatives, in order to obtain the best possible result.

I propose briefly to lay before you the facts with which experience has furnished me on this subject. There are three principal elements to consider in this place.

1. The intensity of the light.
2. The nature of the paper employed.†
3. The proportion of free nitrate of silver which it contains.

1. The intensity of the light in which printing is carried on should always be proportioned to the intensity of the negative. A negative which has been under-exposed possesses, as is well known, many portions quite transparent, which produce in the positive prints the deepest blacks: the "high lights" of the picture are hard, and the middle tints destitute of detail and softness. Such a negative requires to be printed in a bright light to give a good proof: direct sunlight is in this case the best. If, on the contrary, through over-exposure, the negative possesses a dull, flat uniformity, in which the middle tints of the lighter parts are effaced, and those of the shadows too much brought out, such a negative printed in a bright light would yield a cold and monotonous proof. A feeble light, however, will admit of the production of a good print. The following is an excellent method of obtaining light of a convenient degree of intensity when ordinary daylight is very bright: it consists in placing between the glass of the pressure-frame and the negative one or more sheets of white paper of homogeneous nature and more or less transparent, by which means the light becomes diffused and softened, and its action so modulated as to result in the production of a good picture. I ought to mention here that the *proportion* existing between the lights and shadows of a negative is the point which should be considered in coming to a conclusion as to the amount of light to which it should be exposed, and not the absolute density of the high lights. Indeed, a negative may have some parts extremely dense, and yet, if the exposure in the camera have been continued too long, the general character of the negative will present so few contrasts that a feeble light will, notwithstanding, be the best for it.

Thus—to recapitulate—a feeble light, having an equable action, and giving very little contrast in the extreme lights and shadows, is best for negatives of an uniform character; a brilliant light giving, on the contrary, a more uniform image, is more suitable for hard negatives—that is to say, those in which *the high lights are very opaque and the shadows very transparent.*

These phenomena being modified by the nature of the positive paper, it is necessary to study this and examine the influence exerted by its constituents on the beauty of the proofs.

Let it first be observed that the presence of a large proportion of free nitrate of silver has a similar influence to an increase in the power of the light. Thus a paper sensitised on a bath of 20 per cent. will, with the same negative and in the same light, yield a proof possessing less of contrast than if it had been sensitised on a bath of only 15 per cent.

It follows from this that a paper sensitised on a strong solution of nitrate of silver is most suitable for hard negatives (*i.e.* under-exposed), while that prepared with a weak solution is to be preferred for negatives of a feeble and uniform character.

* Read at a Meeting of the Marseilles Photographic Society, January 31, 1862.

† I mean by this not so much the molecular structure of the paper as the preparation by which it is rendered fit for photographic purposes—that is to say, the bleaching and sizing.

It should always be observed that, as the vigour and tone depend upon the excess of nitrate of silver, the proportion of this may not be sensibly diminished below fifteen per cent., if it be desired to bring the toning and fixing of the print to a successful and satisfactory issue.

Let us now examine the effects produced by the preliminary preparation of the paper. Positive paper may be divided into two very distinct classes:—

1. Salted paper.
2. Albumenised paper.

1. Ordinary salted paper contains simply a certain proportion of a soluble chloride.

2. Albumenised contains, besides the chloride, some organic matter, viz., albumen.

After sensitising, the first contains chloride of silver, the surface being covered with a film of free nitrate of silver.

The second, besides the two salts, contains a large proportion of a particular body very little known—a body similar in composition to that which is produced when albumen is added to a solution of nitrate of silver. This substance has been described in an able article by M. l'Abbé Pujo, in which he states that it (which the author calls albuminate of silver) has the property of giving dense, hard pictures.

It is to this substance, also, that albumenised paper owes the property of giving proofs having more contrast and greater sharpness than those obtained by simply salted paper.

It is understood, therefore, that the proportion which exists between the albuminate and chloride of silver contained in the albumenised paper exercises an important influence upon the positive proofs—a large proportion of albuminate being suitable for dull, flat negatives; and, on the contrary, a large proportion of chloride being suitable for hard, dense negatives. Or, in other words, the proportion between the albuminate and chloride influences the result in the same manner as an excess of nitrate of silver or the intensity of the light; and it is upon the establishment of a due proportion between these four elements that success in positive printing depends.

It is impossible to determine exactly the proportions to observe between these elements, according to this or that intensity of negative: it is by experience alone that we can learn the practical rules to which we must conform in this particular.

In a paper which I hope soon to have the honour of laying before the Society, I propose to describe the influence of the above elements on the toning and fixing of prints—that is to say, the tone and vigour which they acquire in the gold toning bath and the hyposulphite of soda solution.

"NOTES," HARMONIOUS AND DISCORDANT, ON VARIOUS SUBJECTS.

By J. T. Taylor, Edinburgh.

Large Pictures.

It was once my lot to spend a couple of days in the pretty town of ———, and seeing in a bookseller's window a life-sized photograph, with an intimation affixed that it was the production of Mr. A———, the photographer, from whom particulars might be learnt, I lost no time in ascending a long and wearisome flight of stairs, at the end of which I found the "saloon," which truth compels me to state was merely a garret-looking room, with some window-sashes inserted in the roof, *vice* slates removed. A few minutes' conversation with Mr. A——— satisfied me that Nature had been in a merry mood when he was made, and that, to make amends for some important deficiencies, she had given him a most lavish development of what phrenologists call No. 10. The conclusion that *he* was entirely innocent of being concerned in the production of the large picture was irresistibly forced upon me; but in the course of conversation I asked him with what sort of camera he took his large portraits, and if I could see it? To which he replied he was sorry he could not favour me with a sight of it as he always kept it atl his country house, but if I wished a portrait life-sized he would take a small one of me and enlarge it: it was a very peculiar process he said, and would occupy nearly a fortnight, and for pictures of this class he was always paid in advance. Mr. A——— being suddenly called away, the boy who was blacking up my shilling's worth (for I had invested to that amount) turned to me with a grin, and opening a closet door, "Ecod!" said he, "*this* be measter's country residence, and here be his life-size camera!"—pointing to an old packing-box with a flange for a quarter-plate lens screwed on the end. "But," continued he, "measter beant up to working it: summat always goes wrong when he experiments with it. Mr. L———, an amateur, does all measter's life-sizes."

Accident the same day threw me in the way of the said amateur, whom I found to be a shrewd and well-informed man—a sort of sleeping partner in A———'s concern. We talked a good deal about enlarged portraits and Woodward's patent solar camera. He strongly supported Mr. Shadbolt's view that the condenser being *non*-achromatic would necessarily affect the definition of the enlarged picture. From this view I dissented, as I hold that aberrations in the condenser, whether chromatic or spherical, would only affect the equality of illumination, and not the definition of the enlarged picture.

My new friend always took his enlarged pictures by the following method, which previous experience enables me to state is perhaps as good, and certainly more simple, than any other:—A sharp and rather feeble negative is inserted in the slide of a quarter-sized camera: this is placed up against an evenly-lighted sky, a sheet of ground-glass, a white sheet, or anything else of an uniform white shade. No light is admitted into the room but what passes through the negative (which I need scarcely say is placed next to the sky). A sheet of white paper, or ground-glass, if desired, is made to receive the magnified image, which, after being adjusted as to size and sharply focussed, is made to fall upon a sheet of iodised paper, and after an exposure of about twenty minutes, it is developed with gallic acid, to which a few drops of silver solution have been added. By comparing some prints taken in this way with some by Woodward's solar camera, I am constrained to admit that the former seem more agreeable.

But the method which to me seems the best and most manageable is by the magic lantern, with, of course, an achromatic object-glass and oxyhydrogen light. The other evening, with an arrangement of this kind, I took an enlarged portrait of Mr. Marwick, the respected President of the Edinburgh Photographic Society, which I feel satisfied could not have been surpassed in sharpness had it been taken direct. In printing by development no subsequent toning is required, as by the exercise of a little judgment when developing almost any kind of tone may be had. These photographs must (preferably) be printed on non-albumenised paper.

Objections have been taken to the flat, lack-lustre appearance of such prints. Now, with judgment and proper manipulation this need not be the case. But those who object to such "deadness" may obtain any amount of brilliancy by coating the picture when dried and mounted with the following encaustic paste, which also acts most beneficially in preserving the photograph from deleterious atmospheric influences:—Dissolve Ceylon elemi in oil of lavender, and add to it wax which has been previously softened by the addition of a little of the same oil. Now add a very small quantity of oil of cloves so as to make a pomade of such thickness as to be easily applied with the finger. After it is spread allow it to dry for five minutes, then polish with a piece of woollen cloth. For this encaustic we are indebted to M. Clausel.

Dry Collodion without a Preservative.

This is a subject which appears to be distracting some portion o the photographic world at present. It is undoubtedly the simplest of all dry collodion processes. As some doubt appears to prevail as to its authorship, allow me to quote from a letter published by Mr. Geo. R. Muirhead, of Glasgow, dated August 4th, 1854:—

"I have found that light acts almost as energetically on a dry surface as on wet, and that if a plate be *well washed* in water (after removal from the nitrate bath) and allowed to dry, it will remain unaltered for a lengthened period, provided it be kept from light or deleterious gases. Before developing the plate must be dipped in the silver bath, as the photograph will not develop without the presence of free nitrate of silver. If the plate be not thoroughly washed it will blacken all over when the developing solution is applied."

About the time this letter was published, I remember receiving from Mr. White, optician, Glasgow, similar instructions for "dried plates," with this addition, that he recommended the use of a solution of iodide of potassium, as an effectual means of getting rid of the free nitrate. With this modification of Mr. White's I have taken many excellent collodion pictures, both positives and negatives.

Photolithography.

It was not without good reason that I urged the propriety of publishing photographic patent specifications in The British Journal of Photography. Its numerous readers lose many a chuckle by this deprivation, for the ignorance of the non-photographic public

as to what has really been discovered is so great that patents are applied for and obtained which outrage common propriety.

In the famous trial, Talbot *versus* Laroche, the Lord Chief Baron, in his charge to the jury, said—

"The ground on which a patent was granted was this:—A party says, 'I have got a secret, and I will tell the public what it is if you will pay me the price of a monopoly for a certain number of years,' and the public get for that monopoly the present use of the patent through the inventor, and at the end of his time they acquired the means of using the secret from the specification. *The law is, that if the thing patented be not new then the patent must fail.*"

Now, no reader of this Journal requires to be informed that bichromate of potash in combination with gelatine, gums, &c., as a photographic surface is anything but a novelty. Mr. Fox Talbot's two communications to the *Athenæum* in April, 1853, in connexion with photographic engravings; Rousseau and Masson's communications in March, 1856, in connexion with photolithography; besides the numerous communications of Poitevin, Osborne, Col. Sir Henry James, and others, set the matter at rest. And yet, in 1861, a patent is obtained by Messrs. Beatty and Alexander, of Dublin, securing, among other things, their sole right to this compound! Their specification is somewhat sweeping in its demands, seeing it embraces not only the bichromate and gelatine, but also transfer inks—metal plates—carbon in powder—printing in colours—"and especially we claim the application upon the surface on which the photographic proof is obtained of an acid resisting varnish on being washed. * * * We also claim the covering with lithographic transfer ink any surface having thereon a photographic proof, then washing away the unlighted parts, and when clean taking an impression of the same on transfer paper and making a transfer of it on lithographic stone." Now what must Col. James and Mr. Osborne think of that? Of course they—together with Mr. Ramage of Edinburgh, who follows out this branch very largely—will immediately acknowledge the superior, because later, claims of these Dublin gentlemen, and suspend their business operations accordingly.

A circular at present on the table beside me gives notice that a reward of £105 will be paid to anyone giving information as to infringement of this comprehensive patent; and I accordingly claim this handsome reward by hereby informing upon—*myself!* I have often used bichromate of potash in combination with gum, and intend doing so again when it suits my convenience. Seriously, I think it is scarcely fair for the Patent Office to take money from every person who may rush to them with their supposed novelties; but I presume they leave each applicant to defend his own assumed right, and, if this be so, then for them "the more the merrier!"

Distortion.

In the course of my reading I have stumbled upon a paper in some of the journals which is certainly of a most suggestive character. It is by Mr. J. H. Dallmeyer, a London optician—I take it, a well-known one. The paper, as a whole, as well as some statements in particular, merit far more than a passing notice such as they could receive just now, especially as in the few "notes" struck at present the discordant seem to predominate over the harmonious. The subject of distortion, then, must remain over till next "Notes."

PHOTOGRAPHY IN ITS APPLICATION TO BOOK ILLUSTRATION.

By S. Thompson.

The application of photography to book-illustration is not by any means a new or novel idea; but its value has hitherto been scarce sufficiently appreciated. We have had works published from time to time which have pressed it into their service; but either from injudicious selection, imperfect photography—as practised by the illustrators, who have in many cases been also the authors—or want of adaptation to the subject, its scope and capabilities have not been duly and fairly estimated.

I rejoice to see, in many directions, a movement towards a wider and more discriminating appreciation of its value in this walk of art. I have faith in the future of photography, in any and all of its applications, and I fearlessly predicate that it will create for itself a sphere of action in this direction. I expect to see the time arrive when we shall look curiously at announcements of new works in order to know whether they are to be illustrated by John Tenniel, J. D. Watson, our favourite Birkett Foster, or some equally famous photographer. I can admire them all—diversity is charming! The drawings of one of these—so full of power, so graceful and tender—cannot be ranked too highly! But for verisimilitude, for subtle power in raising the keenest emotions, by presenting to us *fac-similes* of places we have seen and loved, photographic pictures are beyond compare. Samuel Prout—no mean authority—once said, "I would rather have a photograph of any place that is dear to me than all the pictures of it that were ever painted." No picture produces an impression on the imagination to compare with a photographic transcript of the home of our childhood, or any other scene with which we have been long familiar. It may not be pictorial in itself, but it will have the power to moisten the eye, and set the heart dreaming of by-gone days. It may be that only "the vision of one happy day lingers around that image," or we may remember it as long as we remember the stars in Heaven. "The secret of our emotions never lies in the bare object, but in its subtle relations to our own past. No wonder the secret sometimes escapes the unsympathising observer, who might as well put on his spectacles to discover odours."

I regret to be compelled to observe a great want of that catholic spirit which should prevail in every department of art. Book-illustration by photography* appears to be taken as an invasion of another domain, the which has elicited some amount of ignorant criticism. It was ever thus: the party of conservatism and that of innovation are very old, and have disputed possession of the world ever since it was made. But photography has not been *mis*-sent to an earth-world where all the seats are taken. I say—not unadvisedly—*ignorant* criticism, because some of the reviewers of the work referred to have betrayed an almost cimmerian darkness in regard to the conditions involved in the production of a really good photographic picture.

It will not be thought too much to assert also that an education of the eye is as necessary to estimate the comparative merits of photographs as of paintings. To the trained eye a hundred things force themselves forward for attention which are as invisible to other eyes as the difference in the manipulation of Turner, Etty, Wilson, and others, is to other than artists or connoisseurs. Try and remember—and there are few who cannot do so—the first gust of youthful uneducated admiration of some painting which the trained eye now regards with a sterner, juster appreciation. Photography has its difficulties—not perhaps like that of drawing a foreshortened arm—which, though different in kind, are not less in degree. To the initiated, many photographs display great difficulties contended with and surmounted, and much art in the fine *nuances* which constitute the great difference between one artist and another. A reviewer of this work, in the *Spectator*, apparently wishing to condense the subject into a nutshell, asks, with withering sarcasm, "if the work of *a machine* can for a moment be compared with the work of a creature possessing heart and brains?" Tried by a rigid logic, I find no fault with his conclusions: logically they cannot be other than what they are. But I object *in toto* to his assumptions: starting from false premises his conclusions must necessarily be false. He has first to prove how much of a really beautiful photograph *is* the work of "a machine." Alas! how many of us become violent partisans when we ought to be simply earnest students!

I cannot now do better than quote the language of Mr. and Mrs. Howitt, in their preface:—"It appears to us a decided advance in the department of topography thus to unite it to photography. The reader is no longer left to suppose himself at the mercy of the imaginations, the caprices, or the deficiencies of artists, but to have before him the genuine presentment of the object under consideration. We trust that this idea will be pursued to the extent of which it is capable, and that hereafter we shall have works of topography and travel illustrated by the photographer, with all the yet-to-be improvements of the art, so that we shall be able to feel, when reading of new scenes and lands, that we are not amused with pleasant fictions, but presented with realities."

It remains but to speak of the photographs illustrating this work as being many of them very beautiful, though of very unequal merit. I like those by Bedford and Russell Sedgfield (by whom the whole were printed) best. The *Strid*, *Bolton Priory* (Sedgfield), is a gem. *Raglan Castle—Grand Staircase* (Bedford), is exquisitely beautiful—so brilliant—so soft—so *perfect*. I regret to see some of Wilson's, of which I know him to possess finer versions of the subject. '*Prentice Pillar*, *Roslin Chapel*, is, however, very good: also *Holyrood Abbey*. *Chepstow Castle* (Bedford) is a remarkable example of photographic composition. Most landscape photographers know the inherent difficulties in making a *picture* of a *general* view, to embrace which you must retire some distance, constituting nearly two-thirds of your view "foreground,"

* Ruined Castles and Abbeys of Great Britain. By William and Mary Howitt. Illustrated by Bedford, Sedgfield, Wilson, Fenton, and others. London: A. W. Bennett, 5, Bishopsgate Without.

and that foreground bald, flat, and uninteresting. In this example, the judicious use of a rustic gate and of a perfectly *unconscious* figure, well-placed, has metamorphosed it into an excellent picture. *Furness Abbey* (Fenton), though somewhat too dark, is a very artistic photograph.

With regard to the prose portion of the work, a most interesting subject—"The Ruined Castles and Abbeys of Great Britain"—has been treated with much care and precision, and contains some graceful writing; *how* interesting a subject is best told in the passage which I here quote as being both an example of the style and scope of the book:—

"Whilst recalling for a moment the past glories of these memorials of a vanished condition of human society in these islands, we have felt strongly not only the fragmental beauty of their remains, but the lessons and encouragements that they afford us. They stand amid the fair landscapes of England as if meant only to stud them with gems of additional loveliness; but from amongst their ivy-mantled walls, where huge trees strike their roots into their once hallowed or dreaded pavements, and the wild rose and the wall-flower fling their hues and fragrance from traceried windows once gorgeous with emblazoned glass, there come to us whispers of retribution, and of the profound purposes of Providence. In no country besides our own do we meet with such numbers of the graceful skeletons and fractured bones of the once proud forms of Papal greatness. We are so accustomed to regard these with the eye of poetry and pictorial effect that we almost forget at times the stupendous power of which they are the signs, and of the great conflict and victory of which they preserve the remembrance. How little do we realise the state and the veneration, amounting to terror, with which these superb palaces and temples of a gigantic priesthood were surrounded! With what feelings an ignorant and simple population gazed on their sculptured towers and quaintly-chiselled pinnacles, and, at the sound of their matin or their vesper anthems, prostrated their souls before an overshadowing dread, which drew its triple force from the powers of earth, of heaven, and of hell—which came armed with assumptions more than regal from the King of kings, and His Viceregent sitting afar off on some distant throne, around which, in the clouded imaginations of the long-bowed-down multitude, flashed the lights of Deity, and beneath which roared the fires of delegated damnation. How little do we now realise the deep reverence which like an aura rose up from the broad lands and wealthy farms, the dark, vast forests alive with deer and wild cattle, from the streams and the mountains that lay around the palaces of these satraps of that spiritual king, and set them above the steel-clad barons, themselves so haughty and august! No longer with the same palpitating souls do we behold the great mitred abbot issue with his train like a very army, with crozier and cross and banner borne before him, and with glittering battle-axes following on stalwart shoulders, as he went forth to attend as a great temporal and spiritual peer in Parliament. No longer do we drop, with all our kith and kin, on our knees, and as the solemn dignitary slowly passes by on his plump mule, in caparison of damask and gold, receive the blessing from his extended hands. Those hands! which could to the general belief open the gates of Paradise, or lock them up at pleasure—open the place of purgatorial or of more consuming fires!"

* * * * * * * *

"And now, from these fallen haunts and tabernacles of the past spiritual dynasty, come up more reconciled and musical voices. The wrath and the resentment have died out, and we remember only the beauties and the benefits. We recall the works of literature preserved, the science delved after, the arts cherished, and the benevolence practised towards the poor. We seek, though yet with unequal success, to revive the architectural genius which evolved these fallen fanes; amid their crumbling stones and clasping ivy we seek for principles of grace and truth; and these point us smilingly to that inexhaustible source whence mediæval builders drew their laws of forms—to all-informing, God-informed Nature. To these voices, to this great school-mistress, we cannot listen too much or too frequently, amid the beautiful remains of the Castles and Abbeys of England."

ILLEGAL USE OF PHOTOGRAPHS: IMPORTANT TO PROFESSIONAL PHOTOGRAPHERS.

COURT OF EXCHEQUER, Feb. 18.

(*Sittings at Nisi Prius, at Guildhall, before the* Lord Chief Baron *and a Special Jury.*)

MAYALL V. HIGBY.

Mr. Vaughan Williams and Mr. Blaine were counsel for the plaintiff; Mr. M. Smith, Q.C., and Mr. Aspland for the defendant.

This was an action by Mr. Mayall, the well-known photographer, of Regent-street, to recover the original photographic portraits of several distinguished persons, and also damages for the illegal use which the defendant had made of them in copying and selling diminished impressions in the form of *cartes de visite*.

Mr. Mayall was called, and gave the following evidence:—In 1857 Mr. Tallis, the publisher of the *Illustrated News of the World*, called upon me and asked me to lend him a number of my portraits of eminent men, for the purpose of engraving and publishing weekly in his paper. I agreed to lend them to him on condition only that he would return them as soon as engraved. It was subsequently arranged that I was to have an advertisement inserted in his paper gratis. I handed over to him, from time to time, about 200 photographs for engraving; among them were Lord Brougham, Prince Dhuleep Singh, Mr. Serjeant Shee, the Prince Consort, Lord Campbell, the Rev. J. Bellew, and other distinguished persons. They were all engraved and published in the *Illustrated News of the World* weekly. Some of them were returned after being engraved. I also lent him photographs which, to the best of my belief, have not been engraved. Among them were the Earl of Dartmouth, the Duke of Rutland, Mr. Bernal Osborne, Mr. Tom Taylor, the Rev. Baptist Noel, Prince de Joinville, Lord Rosse, and others. The photographs were taken by me by arrangement. Lord Brougham and others came to me for their portraits. I stated to them that the negatives were my property, and I asked their permission to publish them: they gave me their consent. In many cases permission was refused. On all the photographs produced permission was given. I took the portraits at my own expense, and gave a copy to the parties who sat for them.

The portrait of Lord Brougham in an oratorical attitude was produced and handed to the jury.

Witness continued:—Mr. Tallis became a bankrupt in 1860, but his paper continued as before. After his bankruptcy I found that reduced copies of my photographs were being sold. I had not myself published or authorised to be published any copies of them. I found that Mr. Bennett, of Bishopsgate-street, was selling them, and I called upon him and ascertained that he was publishing them for Mr. Higby, the defendant. Mr. Higby afterwards called upon me and offered to sell me the photographs and the negatives he had made from them for £250. I stated I would give him no definite answer till I had consulted my legal adviser. On his calling again I refused to hold another conversation with him.

In cross-examination:—I have sold a few copies of the original of Lord Brougham and a few others to their private friends at £2 2s., with an express understanding that they were not to be copied. I sold no copies of Prince Dhuleep Singh except to himself. No offer that I can recollect was made for Sir John Pakington. (Laughter.) Alderman Carden was returned by Mr Tallis. As soon as I found that the portraits were being sold I wrote to the assignees of Mr. Tallis, saying they were my property.

The evidence of Mr. Mayall was confirmed by his secretary, and witnesses were called to prove the value of the photographs and of the reduced copies of them sold by the defendant.

On behalf of the defendant, Mr. Smith stated that he should prove that Mr. Higby had bought the portraits from the assignees in bankruptcy of Mr. Tallis under the impression that they had a good title to them, and that he had paid considerable sums for them, and was acting in a perfectly *bonâ-fide* manner.

The Chief Baron said that after the evidence that had been given there was no pretence for saying that any property in the photographs passed to the assignees; that the defendant, though acting *bonâ-fide*, had no right to them, and must look to the assignees for his remedy.

It was ultimately arranged that a verdict should be entered upon the count in *detenue* for the plaintiff for 40s., upon the understanding that the photographs should be given up to the plaintiff; and, after direction from the Judge, the jury returned a verdict for the plaintiff of £25 upon the count charging the defendant with illegally using the photographs by making and selling reduced copies of the same, the question being reserved for the Court whether any such action would lie in the absence of any law of copyright relating to photographs.—*Times*.

Toning Baths.—Mr. S. R. Divine, in a communication to *Humphrey's Journal* (American), makes the following remarks:—"Different samples of chloride of gold will vary in the degree of acidity, and the amount of carbonate of soda or other neutralising material cannot be definitely prescribed. A very safe way of proceeding is to immerse a slip of litmus-paper in the solution—the acid causing it to turn red—and to add bicarbonate of soda till the litmus will retain its blue colour. The soda should be in solution, saturated, and should be well shaken up after each addition. Enough gold must be used to tone the prints moderately quickly. I have no faith in the various nostrums that are frequently added with chloride of gold to secure fine effects. Gold is the only toning agent known at present that is of any value. All that makes it necessary to add a neutralising substance is to influence the rapidity of precipitation. A certain class of metals require to be in an acid solution to be precipitated by reagents, others in an alkaline, and some are readily thrown down in an acid, neutral, or alkaline state. Gold in the form of chloride is precipitated slowly by silver from an acid solution, more rapidly from a neutral, and still more rapidily from an alkaline liquid. The size of the granules of metal that are thrown down also varies with these circumstances. Attention to these facts will instruct us in the true theories of toning, and from true theories rightly applied results the highest order of practice."

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

SENTIMENT (*continued*)—ABOUT SKY AND CLOUD PHOTOGRAPHING—ILLUSTRATION FROM NATURE—ONE COMMON SOURCE OF FAILURE—THE HARMONIOUS WORKING OF COLLODION, BATH, DEVELOPER, &c., ESSENTIAL TO THE POWERFUL EXPRESSION OF SENTIMENT.

"It is a strange thing how little people in general know about the sky. It is a part of the creation in which Nature has done more for the sake of pleasing man—more for the sole and evident purpose of talking to him and teaching him—than in any other of her works, and it is just the part in which we least attend to her. * * * There is not a moment of any day of our lives when Nature is not producing scene after scene, picture after picture, glory after glory, and working still upon such exquisite and constant principles of the most perfect beauty, that it is quite certain that it is all done for us, and intended for our perpetual pleasure. * * Sometimes gentle, sometimes capricious, sometimes awful—never the same for two minutes together; almost human in its passions, almost spiritual in its tenderness, almost divine in its infinity, it is surely meant for the chief minister of what is immortal in us, as it is the chief minister of chastisement or of blessing to what is mortal."—*Ruskin.*

MY DEAR FELLOW-STUDENT,

But the great source of sentiment and spiritual beauty lies in those phenomena of sky and cloud and vaporous exhalations which we have never yet done thorough justice to in our photographs. Not that, even with our present appliances, it is impossible to do so, but because we have hardly yet began to recognise the importance of such as the real source of poetical loveliness. Not long ago we were quite content with leaving white paper* to represent the sky, but to our credit we saw the absurdity of this directly it was pointed out, and at once abandoned the funny mistake; but we have not yet began to register the actual aspects of that wondrous realm of eternal beauty, up into which the tiniest bird soars unchecked, and down through which the far-away and mightiest worlds of the universe show like twinkling specks of fire. The fairy visions of "the blue firmanent aloft and wide," with its myriad forms of sublimity, beauty, and grandeur, form the brightest visible realm of eternal loveliness that can attract and delight the artistic eye. And yet with too many of our photographers this fact is one entirely overlooked. If not so far behind the taste of the day as to view white paper "skies" with the bliss of contented ignorance, they think it quite sufficient to keep it from being glaringly prominent, and to preserve the effects of tone and the partial truth of space by one uniform grey tint, or ditto prettily graduated. But why not be more ambitious? We have sufficient warranty for our attempts in occasional successes in this direction; and we know where our chief difficulties—certainly not small ones—are to be met. The reward I can assure you is one well worth all the labour and study which, as scientific or artistic photographers, we can devote to our task; and the loftier claims of landscape photography as a fine art will date from that happy day on which we begin to secure *truthfully* the natural phenomena of sky and cloud, no less than those of land and water. Not one without the other—a correct properly-exposed sky, with a false under-exposed landscape, or a hard, opaque, storm-gloomy sky, with a clear, bright, luminous landscape; but one grand harmonious whole, in which every breath of the sky sentiment lives and moves in the landscape also.

I remember when out with the camera once calling the attention of a friend then working the wet process to a grand effect of sky and cloud, which I challenged him to secure. Streams of golden glory from the hidden orb of day charged with their line of levelled spears the shadowed masses of opposing cloud. But the gloomy, motionless legions, obstinately defiant, held their own, save in two distant points where the radiant foe rent asunder their phalanx-like troops, and came streaming through the infinity of space in two well-defined unbroken lines. The effect was indeed superb, and my friend cried exultingly that he had brought with him a little very old collodion for plate cleaning, which would be just the thing for a trial!—that he would just add a little acid to his bath and weaken his developer, and go a-head! He did so, and thus got what he in his enthusiasm called a "glorious negative!" In the print from this negative there was very much to admire, certainly; but the light had lost its palpitating vitality, the shadows their aërial transparency, the space its infinity—nothing was registered save the more vigorous contrasts, and these were woefully exaggerated. Where the defeated sun-spears should have melted away in the thickening vapours which gradually closed against their further progress, the photograph gave abrupt terminations and sudden contrasts; and where the gleaming lines shot through the azure of the sky, strong in their luminous intensity they were swallowed up in white patches, alike representative of these and of the wondrous depths in which they existed. There was a wild stormy effect in the dark masses, and a lightning-like gleaming here and there, where the sunlight touched with pallid fire their dark extremities; but all the delicate and minute detail, all the exquisitely tender tones, and soft, melting touches of ghostly light and shade, where the vapours died imperceptibly into the blue void, or the fierce light came stealing so weakened and subdued through the cloud shadows, more or less faintly, according to their position, and to the greater or lesser degree of transparency—these and the various degrees of tenderly reflected light, and a hundred other fairy-like charms constituting the great beauty of the whole, were altogether lost and destroyed. Now, if my friend had been about to photograph, say some delicate work of fragile art, in some semi or more than semi-transparent material, full of faint delicate detail and subtle tones of light and shade, he would have laughed to scorn the idea of using the old collodion, the acid bath, and the weak iron developer, which he thought the right things for a magnificent sky picture, full of details, and aërial tones, infinitely more delicate and refined than those of the most fairy-like of wondrous modern art-creations. This was the source of his failure, and is the source of most such failures; and is representative of our great difficulties in the pursuit of truthful sky effects. I have now, my dear fellow-student, pointed out our foe. Wilson, Blanchard, and many others, by rare and occasional successes, give us hope. Our chemists and artists must find the weapons. And the reward!—language is not eloquent enough to describe this: so I will e'en be silent. But if you read that portion of Ruskin's *Modern Painters* which treats of sky and clouds, you may form some idea of its probable value.

The study of pictorial sentiment or expression or feeling, however, is not confined—as the above hints—to mental cultivation, or to selections from nature, or choice of light, season, &c., &c., but has its elements in every mechanical stage of our picture-creating progress: in the choice of lens, the selection of collodion, condition of the bath and kind of developer—in the printing, the toning, and even in the mounting. It is not my province to enter fully into these questions, which I leave to those having greater experience and therefore better claims to enlarge upon them; but they are all essential to real success. As you well know, one collodion, under certain conditions of bath, exposure, and developer, will give us delicate transitions of *chiaroscuro*, plenteous detail, and clear, transparent shadows, leaving, as a rule, the intensity required for attainment in an after-process; while another gives under the same conditions more vigorous contrasts, less detail, less transparency in the blacks, and almost or quite sufficient intensity after simple development. Collodions, moreover, lean to one or other of these descriptions more or less, so as to produce a large variety of different qualities. The choice of collodion as an element in the expression of sentiment meets us, then, on the threshold of our mechanical practice. For this landscape, in which contrast and vigour are the predominating qualities required, we can spare that refinement and delicacy of *chiaroscuro* and detail which this or that heavily-bromised collodion may give, but require clear, glass-like shadows and that amount of intensity which is very apt to degenerate into hardness and crudity if sought in the intensifying process *alone*. To be brief: the foundation of the qualities you seek in expressing sentiment should always, I think, exist in the collodion. Another element of expression lies in the developer—I presume you use iron—as influencing the amount of detail and its more or less definite character, &c., an essential difference existing in the action of various developers of different degrees of strength, as I need hardly add. Again: the condition of the bath influences the picture, and may also prove a source of power in varying the relative character of the lights and shadows in some cases; for instance, the positive absence of black altogether from the print being sometimes an advantage of no small moment to the sentiment expressed.

There is, also, a great source of power in expressing sentiment in the many influences which may be brought to bear in our printing and toning, as Rejlander has so ably shown, and also *in the colour of the proof*—a fact which has been somewhat strangely overlooked. We can obtain various hues and shades of purple, ranging from the cold and bluish to that warm golden tone which would do so much for the sentiment of a sunset photograph. We have a wide range of browns of various degrees of warmth, and a goodly variety of greys, neutral and otherwise; and then again we have black in its purity.

In a previous letter I have shown how tone will suggest colour and the sentiments therewith associated, but now we deal direct with colour itself. I must reserve this consideration, however, for my next.

ALFRED H. WALL.

*"White paper is not the least like air."—*Modern Painters*

Scraps and Fragments.

ENLARGEMENT.—M. Arthur Chevalier has just published a little treatise on enlargement, practically and theoretically discussed.

ALBUMENISING.—Messrs. Lewitsky and Schpakoffsky have invented a piece of apparatus for continuously albumenising a sheet of paper of indefinite length.

CELESTIAL PHOTOGRAPHY.—M. D. van Monckhoven is about to proceed to Italy to superintend the erection of photographic apparatus for the automatic registration of astral phenomena.

VIEWS IN THE PYRENEES.—Mr. F. Maxwell Lyte's large-sized views in the Pyrenees, recently taken for the French Emperor, are to appear at the International Exhibition amongst the French collection.

NEW MODE OF PRINTING.—M. Wothly has presented to the French Photographic Society some proofs (by a new process) obtained by the use of the sulphides of sodium, antimony, and lead, which he expects are absolutely permanent.

MASON *v.* HEATH.—Litigation in connexion with our art appears to be on the increase. At the time of "going to press" an action is pending in the Court of Common Pleas touching the property in a negative photographic portrait of his late Royal Highness the Prince Consort. We are of course only partially informed upon the merits of the question; therefore any opinion thereon would be as yet premature. We shall probably give the details of the trial in our next issue.

PHOTOGRAPHICALLY ILLUSTRATED WORK.—We have recently seen one of the most tasteful publications for the drawing-room table that has hitherto appeared. Messrs. Negretti and Zambra have lately brought out a work on Egypt, Nubia, and Ethiopia, of a small quarto size, illustrated by one hundred photographic stereographs taken by Mr. Francis Frith.—The descriptive letterpress, by Mr. J. Bonomi, is interspersed with numerous wood-engravings, and is further enriched by numerous critical notes from the pen of Mr. Samuel Sharpe. The whole is elegantly bound, and accompanied by a folding stereoscope.

PHENAKISTISCOPIC PICTURES.—M. Dumont has presented to the French Photographic Society a new invention for procuring twelve negatives, showing the successive phases of an object in motion. The end proposed is not only to obtain natural moving stereoscopic images, but also to secure with certainty the best phases of objects in motion in an artistic point of view. The object is effected by a revolving cylinder with twelve facets thereon to carry the sensitive plates, and, by an ingenious contrivance, these are exposed successively only when brought exactly into a position at right angles to the axis of the lens.

LIFE-SIZED PORTRAITS.—We have recently inspected, with considerable pleasure, two half-length life-sized portraits at the establishment of Messrs. Negretti and Zambra, being the likenesses of Mr. Negretti and his wife. They are by far the most effective of this kind ever attempted in this country; and for mural decoration have quite sufficient definition without any aid from the pencil. That of Mr. Negretti is entirely untouched, while that of the lady has the net which confines the hair painted in. The treatment in both pictures is artistic, and the half-tones all that can be desired. We have been informed by M. Claudet that he is turning his attention in the same direction, and has certain productions of the kind "on the stocks," as the dockyard phrase runs.

On this subject we find the following in the *Athenæum*:—

"It will interest English readers to know that the Prince of Wales employed some of his short stay in Munich in sitting to Herr Albert, the court photographer, for one of his life-size photographs. The portrait of his Royal Highness is to appear in the Exhibition, and cannot fail to attract attention. We believe Herr Albert is the only photographer who has produced portraits the size of life: they are certainly his invention, and we have not yet seen them imitated. The Prince of Wales's portrait was finished in five hours' time, and it is at the Prince's own desire that it is to appear in the Exhibition."

We think it a great pity that the worthy editor of the *Athenæum* does not keep himself better "posted up" in matters photographic. We know that he has the opportunity. Were he to do so he would not have fallen into the error of supposing that Herr Albert is the *inventor* of life-sized photographs, still less that he is the *only* producer of such pictures. As to the invention, it rests with our countryman and good friend, Mr. F. H. Wenham, who brought the matter before the Photographic Society in 1853 or 1854 (we quote from memory only), and a paper by him on this subject may be found in the *Journal of the Photographic Society* of the date specified.

Meetings of Societies.

MEETINGS IN MARCH.

4th.—London and Liverpool.
5th.—Manchester, Edinburgh, and Bradford.
6th—Glasgow.
7th—Newcastle.
11th.—Photographic Society of Scotland and Birmingham.
13th.—South London and Chorlton.
19th.—North London and Edinburgh.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

AN ordinary meeting of this Society took place on Wednesday evening, the 18th ult., at Myddleton Hall, Islington,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The CHAIRMAN announced that this was, in accordance with one of the rules of the Society, the appointed evening for the *nomination* of Officers and Committee, who would be *elected* at the next, which would be the annual, meeting of the Society; these formal proceedings, however, he thought might be deferred until a later period of the evening. He (the Chairman) had brought for the inspection of the members a couple of American stereoscopic pictures, among which was the portrait of Mr. Coleman Sellers. These were examined with interest by the members.

Mr. SIMPSON exhibited some prints from negatives taken on simply washed collodion. The subjects were *Shakespeare's House*, at Stratford-on-Avon, and *Ann Hathaway's Cottage*, at Shottery, near Stratford-on-Avon: the latter was taken with a lens of 15 inches focus and an exposure of three minutes. The pictures bore good evidence of the possibility of preparing dry collodion plates without a preservative.

Mr. SEELEY, who had been unsuccessful in his experiments in this direction, said he would feel obliged if Mr. Simpson would furnish him with the formula.

Mr. SIMPSON stated that some kinds of collodion were more applicable than others for this purpose, but that it seemed to be a necessity that one bromo-iodised should be employed. For the rest, that which adhered most firmly to the glass was to be preferred.

The CHAIRMAN, in the absence of other matter, volunteered to read a paper by M. Niépce de St. Victor, *On Heliochromy*. The paper had recently been read before the Academy of Sciences of Paris. [See page 80.]

In opening the discussion at the conclusion of the paper, the CHAIRMAN remarked that there were several important points in the paper he had just read, not the least among which was the power of being able to retain the colours on the plates for some hours.

Mr. SEELEY said that some few months ago he had been assured by a gentleman connected with the photographic department at South Kensington that they had there once obtained a portrait of a sapper whose scarlet coat was reproduced with almost natural brilliancy: the colour remained four days and finally vanished.

The CHAIRMAN remarked that it was not uncommon to obtain negatives having a reddish tinge, and other *single* colours had been produced, but the difficulty was to expose the plate and obtain all the colours.

Mr. HUGHES reminded the members that it was important to avoid those errors which arose from enthusiasm in connexion with this subject. A coppery tone in a picture had often been called a red image; and it should be always stated whether the colours respectively named were visible by transmitted or reflected light.

Mr. SIMPSON knew of an early collodion picture which he believed was in the possession of Dr. Diamond, in which many colours were very accurately rendered. It was a direct positive, which, having been developed with pyrogallic acid, had yielded a blue sky, a red-brown brick house, and dirty green foliage. The colours were still retained, although the picture was done eight years ago!

Mr. DAWSON had often observed a variety of colours in pictures taken by the collodion processes: he had always regarded them as the result of iridescence. The effect was especially observable while the pictures were wet.

The CHAIRMAN thought the production of colours, such as blue, green, and brown, in one negative, comparatively common; but did not remember to have heard of the reproduction of a yellow colour. This he regarded as a severe test of the capabilities of heliochromy; it would, consequently, be a great triumph when it was accomplished.

Mr. HUGHES directed attention to the fact that M. Niépce de St. Victor had stated that black lines were produced on a white plate: that might be regarded as a negative effect, and equivalent to the reproduction of a yellow from a yellow.

Mr. SIMPSON alluded to the mention made by Mr Malone, in his remarks on ruby silver, that black lines were reproduced on a white ground of chloride of silver.

The CHAIRMAN, noticing that most of the recorded experiments in heliochromy were described as being performed with silver plates, regretted that, as there were now so few daguerreotypists, and that silver plates had gone almost out of use, but few amateurs were likely to repeat these experiments.

Mr HUGHES thought that one important effect of the publishing of researches in this curious branch of the photographic art, was to sustain the faith of photographers in the ultimate possibility of taking pictures in their natural colours. He could not doubt but that the *published*

records were but a small part of a very elaborate series of carefully-conducted experiments, involving the exercise of much patience and perseverance on the part of those who undertook them: they should therefore at all times be received with deference and encouragement, as being likely to lead to important results.

In continuation of the train of thought suggested by Mr. Hughes, Mr. Simpson expressed a hope that as the silver plate had been the pioneer in monochrome photographic pictures, it would perhaps become the pioneer in polychrome or heliochromy.

The discussion on this subject subsiding, Mr. Ross asked if the photograph of *Ann Hathaway's Cottage* was taken with a single or double combination lens? He was led to infer from the brilliancy and general character of the picture that a single landscape lens had been employed. He might mention that Mr. Bedford, who had "gone to Jericho" and other cities in Palestine with the Prince of Wales, had taken with him a fifteen-inch focus lens, and one of twenty-inch focus, stating that he much preferred an ordinary single combination for general purposes to any of the compound forms, because it produced a more vigorous and telling picture.

Mr. Hughes asked if distorted lines were a necessary accompaniment to the work of the orthographic lens, or were they mainly evident at the edges of the field when the lens was "strained?"

Mr. Ross replied that although with the orthographic, as with the ordinary single combinations, the lines produced at the margins of the picture were not, strictly speaking, absolutely free from curvature, unless the lenses were strained to cover a surface larger than they were constructed for, the curvature was so slight that it would be scarcely perceptible.

Mr. Dawson could support the statement made by Mr. Ross in reference to Mr. Bedford's preference for the ordinary landscape lens by informing the meeting that Mr. Wilson, of Aberdeen, had abandoned the use of compound lenses for his general work, and returned to his single combinations.

Mr. Ross remarked, in reference to the pictures of large angular extent recently taken by Mr. Wilson, that it was well known that all lenses, if worked to the full extent of their capabilities, yielded *circular* pictures, from which rectangular ones might be cut, having a *certain diagonal;* and so long as that were maintained, any *shaped* picture, from the square to the long parallelogram, might be cut out of the circular field. He thought there were a great many misstatements put forward in reference to angle of field.

The Chairman thought that clear and concise information on these points should be embodied in our manuals of photography.

Mr. Seeley remarked that a friend of his had taken good quarter-plate pictures with the front achromatic lens of an opera glass, which was, he believed, of similar construction to an ordinary landscape lens.

Mr. Ross could readily understand this, and thought it extremely probable, as there were circumstances, *i.e.*, conditions of glass, which would necessitate the adoption of the same form of lens as that used for an opera glass by an optician constructing a photographic lens. The form and curves of lenses were determined by the specific gravity for the dispersive power, the index of refraction, and other properties of the glass.

A somewhat desultory discussion then ensued, gentlemen reminding each other of the simplicity of their first cameras, "spectacle glasses," "cigar boxes," &c. At its conclusion,

Mr. Ross remarked that every construction of lens had its peculiar advantages, and that it was a mistake to suppose that a great variety of capabilities could be combined in one instrument. For instance, for architectural subjects, when you could not get far enough off, the orthographic lens would admit of the camera being turned upwards. For copying, as for the reproduction of straight lines, the triplet suggested by Mr. Sutton was useful, and for rapidity the single combination.

The Chairman thought it a great point gained to get an eminent optician to admit that any one lens will *not do everything.*

At the suggestion of the Chairman the meeting then proceeded to the nomination of Officers and Council for the ensuing year. Notice was given of an intention to propose an alteration in the rules to allow the appointment of two Vice-Presidents instead of one, as at present.

Although an animated discussion ensued on this subject, it was naturally of such a nature as to render it interesting to the members of *this* Society alone, and not having any photographic interest it is therefore needless to enter into the details of the discussion. The following was the *result* of the nomination:—

President: Mr. Woodward. *Vice Presidents:* Messrs. Shadbolt, Dawson, Hislop, Moens, and Ross. *Treasurer:* Mr. Hill. *Secretary:* Mr. Barnett. *Committee:* Messrs. Simpson, Barber, Shave, Nicholson, Bedford, Manwaring, Bingham, Foxlee, and W. W. King. *Auditors:* Messrs. Foxlee and Hislop.

It is understood that the names of those gentlemen who are nominated for Vice-President but not elected are to be considered on the list to select from for Committee men.

The election will take place at the next meeting, which is appointed for the 19th instant.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at the new place of meeting, Sussex Hall, Leadenhall-street, on Thursday, the 13th ult. The Rev. F. F. Statham, President, occupied the chair.

The minutes of the last meeting having been read and confirmed, the President directed the attention of the members to some presentations which had been made to the Society.

Messrs. Smyth and Blanchard, whose excellent instantaneous stereographs of London were noticed in the pages of this Journal a short time since, presented a photographic copy of an oil painting by Mr. A. F. Patten, now exhibiting in the gallery of the British Institution. Size of original painting, 20 × 16: size of photograph, 8 × 6. The picture possessed unusual merit, and formed a valuable addition to the Society's portfolio.

Mr. Thomas Clark Westfield presented a copy of his work on *Japan and the Japanese, their Manners and Customs: with an Account of the General Characteristics of the Country, its Manufactures and Natural Productions;* originally delivered as a lecture at the Marylebone Literary and Scientific Institution. The work was illustrated by stereographic pictures.

The President remarked, in allusion to the pictures, that that mode of illustration gave a degree of precision and accuracy to works of that kind which they had not hitherto possessed, as he thought the pictures usually contained in works of travel were more indebted to the imagination than to reality.

The Secretary then directed the attention of the meeting to the fact that the Committee of the Society were engaged in what he hoped would prove successful negotiations with the Crystal Palace Company, for the purpose of holding an Exhibition of Photographs and Photographic Apparatus supplementary to, and simultaneous with, the one to be held at the World's Fair. He thought it should be understood that this was not necessarily in opposition to the Kensington arrangements, but that by its means a more adequate representation of photographic interests would be secured.

The following new members, introduced by Mr. Martin, were duly proposed, seconded, and elected:—Mr. J. J. Cole, Mr. R. Harmer, Mr. Shuter, Mr. Haskins, Mr. C. W. Wood. Mr. Robinson, of Leamington, was also elected a member of the Society.

Mr. Simpson, though sensible that he was not quite in order, would submit that the first business of this evening, now that the Society was assembled in its new place of meeting, was to propose a vote of thanks to the President and the Committee of St. Peter's School, Walworth, for the kindness they had shown to the Society in permitting the gratuitous use of their school-rooms as a place of meeting.

The proposition was cordially responded to by the members and carried by acclamation.

The President, in reply, stated that he was sure the Committee of the school would share with himself the feeling of pleasure which he entertained at having afforded a temporary refuge to this rising institution: that feeling alone was a source of gratification to him, and it was of course an additional pleasure to have the small favour thus cordially and publicly acknowledged.

Mr. Davis also proposed a vote of thanks to John Rennell, Esq., for the gratuitous offer of a room at Kennington in which to hold the Society's meetings.

This motion was also unanimously carried.

Mr. Howard, the Treasurer of the Society, proposed that the Society should offer for the acceptance of the Committee of St. Peter's School the long board which had hitherto served the purpose of a table at the Society's meetings.

This having been agreed to by the members,

The President, in reply, doubted if the financial position of the Society was such as to justify it in making presents, but thought that if the members so willed it the Committee would accept their *board* in exchange for their *lodging*. He then called on Mr. Davis to read his paper *On the Manufacture of Collodion.* [See page 56, *et. seq.*]

Mr. Davis illustrated his paper by exhibiting samples of pyroxyline prepared under different circumstances, demonstrating their solubility in a mixture of alcohol and ether, and directing special attention to the mechanical condition of the cotton after treatment with acids. That cotton which retained its fibrous character, appearing but little altered by the acids, communicated a corresponding character to the collodion made with it, which was tenacious and contractile; while the cotton which, from its breaking readily into short pieces, seemed most acted on by the acids, yielded a collodion film of what is called a "powdery" character. Mr. Davis ignited some samples of pyroxyline on white paper, showing the varying amount of carbonaceous residue yielded according to the increase or diminution in the strength of the acids employed.

The President, at the conclusion of Mr. Davis's paper, said that the meeting would be allowing an act of great injustice if it did not pass a cordial vote of thanks for Mr. Davis's very able paper, which, though it had taken a comparatively short time to read, must have taken him (Mr. Davis) a long time to prepare. He (the President) need not represent to that meeting the importance of the subject which had been brought under their notice: all present were fully aware of it, and he was sure that photographers generally would hail, and that with gratitude, any researches which tended to facilitate and improve the manufacture of this important requisite. And he thought the paper now before the meeting was one of great usefulness, especially to those who, from their geographical position, were unable to buy collodion.

A vote of thanks to Mr. Davis was unanimously passed.

In allusion to that portion of Mr. Davis's paper which referred to the use of salts of the organic and weaker metallic acids, Mr. SIMPSON mentioned the early experiments of Dr. Diamond and Mr. Archer with arsenite of quinine, by which means several distinct colours had been obtained.

As it seemed probable that no discussion would follow Mr. Davis's paper,

Mr. HUGHES said he rose in compliance with an invitation. He reviewed the whole subject of the manufacture of collodion. He descanted on the *largeness and vastness* of the subject, the importance which attached to having the materials in exact proportions, of uniform specific gravity, and of allowing the action of the acids to take place at a stated temperature. Too much care could not be exercised in adjusting the *tremblingly-delicate* conditions necessary to success. Mr. Hughes directed attention in detail to each and all of the substances generally employed in the preparation of collodion, and alluded to some of the various methods recommended by different authorities. The general tenor of Mr. Hughes's observations may be gathered from what has been said above, the details of the address being merely an account of what comes within the experience of most photographers who undertake the manufacture of collodion. In reference to the matter more immediately before the meeting, he would ask Mr. Davis—first, why he suggested the use of part nitric acid and part nitrate of potash in his formula for the preparation of pyroxyline? and, secondly, his reason for the introduction of chloride of ammonium into the collodion?

Mr. Davis not replying immediately to Mr. Hughes's queries,

Mr. SIMPSON said that the difficulty of stating accurately the proportions most conducive to success was matter for regret. He would give a formula which in his hands had proved highly satisfactory. *Pyroxyline:*—Nitric acid (sp. gr. 1.420) and oil of vitriol equal parts. Cotton, about 15 or 20 grains to the ounce; temperature 150°; period of immersion, ten minutes; wash and dry. Pyroxyline so prepared was entirely soluble in varying proportions of alcohol and ether. He had used half-and-half as effecting the most perfect solution.—*Iodising compound:*—Iodide of potassium and iodide of cadmium equal parts—or, better, the iodide of potassium might be replaced by iodide of sodium, which was more completely soluble in absolute alcohol. He (Mr. Simpson) had tried chlorides in collodion, and found the only result to be an increase of that silvery whiteness so desirable for positives. He had tried also various organic compounds without obtaining any appreciable increase of sensibility. So far from that, he had found that collodions so treated rapidly lost their sensibility, and that the bath became soon injured. He regarded bromides as accelerators in the case of iron development.

Mr. HANNAFORD thought the formula just described a very good one: he had used it with marked success. He was a little surprised at Mr. Hughes's incredulity as to the quantity of bromides used by American photographers. He (Mr. Hannaford) had used two grains of bromide to the ounce of collodion. The introduction of a chloride he thought more appropriate to the dry processes than the wet. The advantages attending its use arose from its association with the iodide of silver, as it was now an established fact that the presence of one or more salts of silver (not necessarily the nitrate) besides the iodide was sufficient to yield a sensitive dry plate. Speaking from recollection, he thought chloride of ammonium was insoluble in absolute alcohol. Perhaps Mr. Davis could say whether that was so or not.

Mr. DAVIS said that he obtained evidence of the solubility of this salt in alcohol by digesting it with alcohol, filtering, and adding a solution of nitrate of silver, which invariably yielded a white precipitate of chloride of silver.

Mr. EIDMANS, rightly appreciating the weak point of Mr. Simpson's formula, as practised by Mr. Hannaford, asked the latter gentleman if he employed a hydrometer in testing the specific gravity of the acids he employed, as the repeated use of the same acids without such an examination would, he thought, be far from yielding an uniform result.

Mr. HANNAFORD was understood to reply in the negative. He further stated that some photographers had obtained very good results by mixing a number of collodions prepared by different makers.

Mr. WALL having tried a sample of collodion made by Mr. Hannaford in the manner he had named, found it of very superior quality, and was disposed therefore to recommend the formula for its preparation.

Mr. HENDERSON had found the addition of iodide of silver to collodion increase its sensibility.

Mr. DAVIS reminded the last speaker that iodide of silver had been added by Dr. Diamond to collodions containing iodide of potassium.

Mr. SIMPSON said Mr. Hadow, an early worker in the collodion process, had added iodide of silver to collodion, and had obtained an increase of sensibility. In reference to the surprise expressed by Mr. Hughes at the large proportion of bromides used by the Americans, he might remark, in corroboration of what Mr. Hannaford had said, that he had used two grains of bromide to the ounce of collodion, with increase of sensibility and without diminution of intensity. At a recent meeting of the French Photographic Society, the proportions of equal parts of bromide and iodide had been recommended by good photographers.

Mr. VALENTINE BLANCHARD, in connexion with this subject, had some curious experiences to report. He had been making some experiments with the view of ascertaining the nature and proportion of materials which would yield him the greatest amount of delicacy in the middle tints of his picture when taking a portrait. He had used *one* grain of bromide to *five* of iodide, and obtained a good result; the singular point, however, was this, that on reversing the proportions, *i.e.*, five grains of bromide to *one* grain of iodide, he had obtained an equally satisfactory impression, and this too in England, which would lead to the inference that mere geographical position did not influence the result, as had been hinted during the discussion.

Mr. HARMER said he had employed three grains of bromide to three grains of iodide, and had obtained a good intensity: he did not find the result affected by the nature of the base of the respective salts.

A variety of opinions were then expressed on the proportion of iodides and bromides advisable for addition to collodion. On the subject of solvents,

Mr. HANNAFORD thought methylated ether might be employed, but not methylated alcohol.

Mr. SIMPSON thought methylated alcohol of sp. gr. ·805 redistilled would be found sufficiently pure for all practical purposes.

Mr. HENDERSON said he had found bromo-iodised collodion most suitable for cold weather,

The PRESIDENT reminded the meeting that the time for its session had almost expired, and that as Mr. Davis had yet to reply, if other gentlemen had remarks to make, the discussion had perhaps better be adjourned.

Mr. VALENTINE BLANCHARD, acting on the suggestion, moved an adjournment of the discussion.

Mr. FRY, in seconding the motion, expressed a hope that more prominence would be given to the best means of obtaining instantaneous collodions, and that Mr. Davis might perhaps be induced to state the absolute ratio as to sensibility existing between his collodion and others.

Mr. DAVIS, in replying to the queries which had been made early in the evening, said, first—that his reason for employing part nitric acid and part nitrate of potash was that they could not always depend on the nitric acid purchaseable at the shops: it contained frequently lower oxides of nitrogen, as nitrous and hyponitrous acids, &c., and he thought the nitric acid liberated from nitrate of potash purer than that, and was also particularly active in the nascent state at the moment of liberation. Another convenience arising from the adoption of his formula was, that there was no necessity for the application of artificial heat—the heat evolved raising the mixture to 165°, he reducing it to 145° by surrounding it with water.

The PRESIDENT then announced that besides the adjourned discussion, the attention of the members would be occupied at the next meeting by a paper from Mr. Noel Fitch, entitled *Experiences of an Amateur Photographer.*

The meeting was then adjourned.

CHORLTON PHOTOGRAPHIC SOCIETY.

THE ordinary meeting of this Society was held on the 13th ult.,—Mr. W. Griffiths, Vice-President, in the chair.

The minutes of the previous meeting received confirmation, and a few items of the Society's private business were disposed of.

The CHAIRMAN then opened the discussion on dry collodion processes. He said they were then about to interchange opinions and ideas on a branch of photography that was full of interest for all lovers of landscape work. The columns of the journals during the last five or six years bore testimony to the importance in which it was held, and at the same time to the difficulties and disappointments peculiar to it. These had, it was true, been greatly diminished by the discoveries of Taupenôt, Hill Norris, and others; but still all were not satisfied that they had obtained the utmost amount of perfection possible. What was desired was a process simple and easy in its manipulation, equally sensitive with the wet, tolerably certain in its results, and possessed of good keeping properties. These were desiderata "devoutly to be wished," and towards their successful accomplishment every photographer should devote at least a portion of his energies. He then detailed some experiments on simply washed and dried collodion plates, and said he thought that coating the sensitive film with albumen or any other substance was a step in the wrong direction, as such substances always had the effect of diminishing sensitiveness, independently of the extra amount of labour entailed in their preparation. His opinion was that their experiments ought to be directed to the addition of substances to the collodion itself: something had already been done in that way, and with sufficiently encouraging results. The perfection of a collodion film was that in which iodide of silver was intimately associated with another salt of silver, such as the nitrate, acetate, bromide, chloride, &c. It was a mistake to suppose that an organic substance *per se* increased the sensibility of iodide of silver. The effect produced by resin in collodion was simply mechanical. On dipping in the nitrate bath the resin (insoluble in water) became precipitated throughout the substance of the film in the state of a fine powder; and, in the act of that precipitation, each particle carried down with it a portion of nitrate of silver, which was retained with too much force to allow of its entire removal by the ordinary subsequent washing. Some kinds of collodion (without the addition of resin), simply washed and dried, would produce very good results, and in those cases it would be found upon investigation that a small portion of the pyroxyline composing them had, from the temperature or strength of the acids employed in its manufacture, been converted into a resinous substance, as proved by the

later researches of Mr. Hardwich. These were the collodions generally preferred for dry processes, and to which the term "powdery" had been applied. Collodion of the opposite or horny character was believed by competent authorities to be without action on nitrate of silver. If *chemical action* was understood that was no doubt true; but the fact was patent to all that such a collodion simply washed and dried would produce pictures, though not always successful ones. In that case also its action must be referred to as mechanical only, retaining, though with less force, a small quantity of free nitrate of silver in its pores. Some might object to that as not possible after the thorough washing usually given to the plates; but any one might prove for himself the correctness of the statement, by stripping off the film from a glass, putting it into a test tube, with a little distilled water, and, after well boiling, filter, then test the clear liquid with a chloride, and distinct evidence would be obtained of the presence of silver. In fact he believed it to be more difficult to wash out every trace of free nitrate from a film of collodion *whilst attached to the glass*, than to remove it entirely from paper that had been dipped in it, and that would be found a matter of no small difficulty if simple washing in distilled water were resorted to. Assuming what he believed to be the fact, that iodide of silver was totally incapable of change under actinic influence without the presence, in immediate contact, of some other salt of silver, an explanation was at once afforded of many of the strange anomalies met with in working the various dry processes. Referring to iodide of silver, he said it was susceptible of change under light or not according to the manner of its formation. If it were produced by precipitation from a solution of the nitrate or other soluble salt of silver, and with excess of the silver salt, it would be darkened by light, but not so if the *precipitant* were in excess: and yet the two iodides were identically the same in their chemical constitution. The difference in their properties he accounted for in this way:—Every particle of iodide of silver precipitated from a solution in which nitrate of silver was in excess carried down with it a portion of the latter (for which it had, like all precipitates so formed, a kind of mechanical affinity); and however much it might be washed it would still retain sufficient to make it susceptible to actinic influence. The same thing occurred when iodide of potassium or other precipitant was in excess: a portion of *it* was in like manner carried down in mechanical combination, and from which it was almost impossible by washing to entirely free it. But iodide of potassium, not being a salt, like nitrate of silver, susceptible of change when exposed to light, the iodide of silver formed in that way did not darken on exposure; for it could not be expected that two stable iodides, whose affinities were both satisfied, should react on or decompose each other. The latter or insensitive iodide could be converted into the former or sensitive iodide by adding to the smallest trace of nitrate of silver.

Mr. Wardley said it was generally understood that a powdery film was best adapted for dry work; nevertheless his experience led him to prefer a collodion that gave a slightly horny film. He could not say he had found powdery collodions more sensitive than such as he was in the habit of using, nor could he say the powdery kind had in his hands produced greater density of image.

Mr. Hooper objected to the conclusions arrived at by Mr. Wardley. He had a firm preference for the so-called powdery film, and had long considered it quicker in the camera, or otherwise more sensitive to the developer, than the horny sort of film. He had never experienced any difficulty in obtaining a sufficient degree of density. The addition of resin to most collodions gave such a film as he had a partiality for in dry collodion work.

Mr. Rogerson and Mr. Knott expressed themselves in favour of the horny descriptions, and said they could build up negatives on it quite equal to their desires.

The discussion was continued with great spirit up to the ordinary hour of closing, and the business terminated with the usual compliment to the Chairman.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on the evening of the 19th ult.,—J. D. Marwick, Esq., the President, in the chair.

The following gentlemen were ballotted for and admitted as members:—Sherriff Hallard, Messrs. Robert Miller, Wm. D. Hart, Henry Jobson, James Rome, and Charles Robb, Jun.

The business of the meeting consisted of a lesson to the junior members in the manipulations of the wet collodion process, by Messrs. Nicol and Horsburgh.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A meeting of the Committee of the Amateur Photographic Association was held on Monday the 10th ultimo, at 26, Haymarket, London. The Right Hon. the Viscount Ranelagh in the chair.

The minutes of the last meeting having been read and confirmed,

The Secretary read a letter from the Earl of Caithness, expressing his regret that he could not be in town to attend the meeting. The Secretary then laid before the meeting sample copies from the negatives sent in to the Association, the number of which, up to the date of the meeting, was 1756, which, together with foreign and colonial ones on their way to this country, will probably amount to about 2000, and will, it is fully anticipated, even after the process of weeding by the referees, show a total of not less than 1500 *good negatives*.

A question respecting the further reception of negatives having been raised, it was decided that the Catalogue should not yet be sent to press, but be kept open until the 1st of March, as members residing abroad and in the colonies had scarcely had sufficient time to forward their plates.

It also having been suggested that a gold or silver medal is hardly the most useful or acceptable form in which a prize can be given, it was resolved that in each case (at the option of the recipient) a silver tankard, or other piece of plate of equal value, should be substituted.

On considering the propriety and advantage of holding an Exhibition and *soirée*, the chairman kindly offered to place at any time a suitable room at the disposal of the Society.

It was decided, in reference to the selection and distribution of the prints, that each member should be requested to select *three times* as many pictures as he may be entitled to for his subscription, arranging the selected numbers in a preferential order on his list, placing those preferred at the commencement, and so on.

It is confidently hoped that by this arrangement—although members may not in all cases have *every* print most desired—they need under no circumstances have awarded to them pictures which they do not value.

The time for which the award of the prizes should take place was next discussed; and it was resolved that it should not, if possible, be deferred later than the 15th instant.

The idea of establishing a Photographic Art Union in connexion with the Association was introduced by the Secretary. The subject was considered to be of considerable interest; but there being many important questions involved, it was deferred for further discussion till the next meeting.

After the usual vote of thanks to the Chairman the meeting separated.

MICROSCOPICAL SOCIETY.

The Annual General Meeting of the above Society was held in King's College, London, on Wednesday evening, February 12th,—Mr. Farrants, President, in the chair.

The minutes of the preceding meeting were duly read and confirmed.

The Secretary announced the receipt of numerous presents.

The Chairman announced the presentation to the Society, by Mr. Peters, the banker, in addition to the preceding, of his valuable instrument for microscopical writing and engraving, accompanied by an Ibbetson's Geometric Chuck, capable of producing every variety of bi-circloidal figures. The Society was honoured in being the depositary of such a splendid present, and it remained for the members to deal with such munificence as it deserved.

Mr. Matthew Marshall thought that so extraordinary a gift ought not to pass into the possession of the Society in the ordinary way, by the mere record of a vote of thanks to the donor. Mr. Marshall had had the pleasure of seeing some of the performances of the instrument which were executed by Mr. Farrants. He would move their most cordial thanks to Mr. Peters for his valuable present. Mr. Marshall hoped that some member would second the proposal with more ability for doing justice to such a task than he possessed. He did not know whether Mr. Peters was present or not: if not (Mr. Marshall smilingly remarked), so much the better for him (Mr. M.), but he hoped he expressed his feelings in common with every member of the Microscopical Society.

Dr. Lankester was happy to second the motion, and was sure every one must feel that such a contribution as that of Mr. Peters's was not only an acceptable gift, but also an honour to the Society; for when a gentleman constructed a beautiful and complicated instrument like the one before them, and committed it to the care of a body of men, as Mr. Peters had done, it showed that he placed much confidence in their ability to use, and disposition to take proper care of it.

A vote of thanks by acclamation was then awarded to Mr. Peters.

Mr. Lobb mentioned that a most cordial vote of thanks to Mr. Peters had also already been passed at the Council meeting.

The Reports of the Council and of the Library Committee were read and

The President then delivered, as usual, an address on the past doings duly adopted, and the thanks of the meeting awarded to the Auditors.

and future prospects of the Society, which, on the motion of Mr. Burr, seconded by Mr. Tomkins, was ordered to be printed and circulated amongst the members.

The thanks of the Society were next awarded to the late Treasurer, Mr. N. B. Ward, for his services during the long time he had held the office

A ballot then ensued for Officers and new Members of Council for the ensuing year.

Mr. Hodgson, in reference to a remark in the President's address, initiated a discussion relative to the propriety of continuing to distribute to the members copies of the *Quarterly Journal of Microscopical Science*, which, he contended, entailed a very unreasonable expense on the Society's funds, and proposed that the question of publishing the transactions of the Society in a separate form be considered. Ultimately, after a long discussion, the matter was referred to a Sub-Committee to report upon at the next Council meeting.

Foreign Correspondence.

Paris, February 25th, 1862.

A PRETTY large number of new pictures obtained by M. Pretsch, with his engraving process, were presented to the French Photographic Society at the meeting of the 21st of February. These new specimens, though somewhat wanting in vigour, were examined with interest. The desire was expressed that the able artist would take his subjects from nature instead of limiting his efforts to the copying of engravings and lithographs.

A letter from M. Joseph Balsamo to the Society was read, in reply to Dr. Schnauss's article, which the *Moniteur de la Photographie* published on the 15th of October, 1861. In that article our *collaborateur* made known the unsuccessful results of the experiments that he made in accordance with the instructions given by M. Balsamo about a new process for printing with phosphorus, and he dwelt on the contradictions contained in the communication of the Italian author. Several English experimenters have, if I mistake not, confirmed the conclusions of the German chemist. M. Balsamo repeats that the facts announced by him are real, but does not give any proofs, nor does he destroy the arguments of his opponents.

A somewhat long discussion took place on the judgment pronounced in the affair of Mayer and Pierson *versus* Thiébault, as that judgment did not recognise the misdemeanour of piracy in the reproduction of the *cliché*. Those, however, who took part in the discussion did not appear to have studied the subject very well. It was said that the tribunals by this judgment threatened photographers with ruin, as they thus deprived them of all protection against piratical imitators. This is an error. As is remarked in the *Moniteur de la Photographie*, the judges had to decide whether the law of 1793, on artistic and literary property, was or was not to be applied: they had to decide whether the defendant had or had not committed a misdemeanour provided for in that law. Their decision was in the negative; but they reserved to Mayer and Pierson, whose *clichés* had been reproduced, all their rights in the civil courts. The *artistic* property was denied, but not the *material* property. I do not know what is the jurisprudence which regulates these things in England; but it will certainly always be difficult to judge affairs in which photography is concerned according to a law enacted many years before the birth of the new art, and which consequently does not provide for numerous wants to which that art has given rise.

A letter received from the Abbé Laborde has definitively resolved one of those questions of property which so often arise among photographic inventors, and which, when even they are not carried before the tribunals, have not the less their importance. I spoke to you, at the time of its appearance, of the process of M. Fargier, at present prosecuted by M. Charavet. This process is simply that of M. Poitevin, which is based on the use of gelatine and of bichromate of potash; only instead of attacking the gelatine by the surface exposed to the light in order to dissolve the uninsolated portions, M. Fargier turns over the film and attacks it on the under surface. That is all the difference. Now, in the letter I have just spoken of, the Abbé Laborde claims this mode of manipulating as his own, and, in proof of his assertion, refers to a communication from him which appeared in the *Bulletin de la Société* for 1858. I record this fact with all the more pleasure, because the acquirer of Fargier's process has assumed towards M. Poitevin an attitude which has called forth a warm expression of disapprobation from all those who are acquainted with the useful labours of the modest inventor.

A little apparatus called a *lampascope* is at present to be seen in the shops here. It is nothing but a very simple system of magic lantern, applicable to all kinds of lamps. The images magnified and thrown upon a screen are produced with photographed views upon glass. MM. Ferrier and Soulier have furnished from their rich stereoscopic stores an ample collection for the new apparatus. The invention has been favourably received by the public, and is likely to prove a profitable application of the art.

ERNEST LACAN.

Philadelphia, February 1st, 1862.

IN addressing you for the first time, permit me to congratulate the many readers of your valuable Journal on the prospect of peace and continued friendly intercourse between our respective countries. We on this side of the Atlantic have enough to contend against in our domestic troubles without waging war with the nation nearest in kin to us. We feel that our rulers have done right in the Trent affair, and few can be found who do not rejoice at the prospect of peace. In the Northern States of the Union—though we have sent out hundreds of thousands of armed men and our papers are filled with war news— such an impetus has been given to business by the expenditure of vast sums for munitions of war that we can scarce realise how great a contest is in progress near our homes.

The photographic art has had its share of business, and with the professional operators the war has been quite a source of profit. What countless numbers of sun-pictures have been exchanged at the anxious parting of friends from those whom the chances of battle may keep from ever meeting again on earth!

Great men, too, are coming into notice each day, and everybody desires to see the faces of the makers of our history. This want is filled by the charming *cartes de visite*—a style of portraiture fast driving all others from the field.

With the introduction of card pictures has come the first need really felt of good processes of printing and toning albumen paper. This, just now, is the all absorbing subject of thought with those who want to excel, and countless are the number of secret formulæ held by their respective originators. There seems, however, to be two general principles acting as guides. The first is heavy salting, strong silver baths, and deep printing under intense negatives. The second is what is fast becoming very popular, viz., ammonio-nitrate of silver in place of the plain silver solution. There are many ways of using this, the best of which seems to be as follows:—Prepare, say, twenty ounces of eighty-grain solution of nitrate of silver: to ten ounces of this add aqua ammoniæ until the oxide of silver at first precipitated is just redissolved; then add the reserved ten ounces, and *nearly* clear the solution with nitric acid. I say *nearly*, for care must be taken to have the solution alkaline, but not too much so. Finally add half-an-ounce of sulphuric ether. This serves to coagulate the albumen, and prevents the alkaline bath from soaking it off. This bath is called the ammonio-nitrate solution; but it is not what is usually so designated, being rather oxide of silver in an alkaline solution of nitrate of ammonia, and not oxide of silver in aqua ammoniæ.* Paper is either floated on this for four minutes or is immersed in it for an equal length of time. One thing, however, has occurred to me in experimenting with this and similar formulæ—that on no account must paper so silvered be dried over a gas-burner. If heated to excess it loses all its sensitiveness, and prints of a dull lead colour. Every kind of toning bath seems to work well with paper prepared as above, but the preference is given to alkaline chloride of gold—some adding ether to the hypo-fixing bath.

Next in interest to printing are the many ways of adding strength to the negative, it being deemed desirable to have rather strong contrasts between light and shade—not sudden contrasts, but a just gradation of intensity from the very opaque high lights to transparent deep shadows. The limit of this letter will not permit me to dwell on this matter, nor more than to allude to what has been done in copying drawings and engravings. At Washington, under the auspices of the Government, all work on the improvement of the Capitol, &c., is executed from photographic copies of the engineer's drawing, and most admirably have they been done.

In conclusion, I must say a few words about our amateurs. Each day is adding to their number and to their usefulness. The Amateur Photographic Exchange Club is in active operation, and has proved the source of great good feeling and warm friendship among its members.

We are very proud of many of the specimens exhibited—one of the most curious ones being a specimen of micro-photography in the shape of a stereoscopic picture of a grain of felspar, magnified to the usual stereograph size, and showing wonderful relief and clearness. It is the work of Professor Rood, of Troy University, Troy, N. Y., who is an earnest and enthusiastic microscopist.

A friendly controversy is in progress between "Humidus" and "Siccus." But little has yet been written on the subjects in our journals; but the writer of this, one of the only champions of the "wet," has succeeded in dragging a few of his "dry" friends into print—with more hope of benefitting the world by the publications of their ideas than in any hope of converting them to his opinions. But (as a witty friend in Washington writes)—"It is a 'wet process' to do any kind of field photography now." Nothing but one endless spell of cloudy, rainy weather discouraging to photographers, used as we are to a clear blue sky the greater part of the year.

Hoping my letter may be of interest to your readers, I beg to subscribe myself, with due regard, COLEMAN SELLERS.

* This kind of bath, for sensitising albumenised paper, was suggested about two years back by our friend Mr. Hardwich.—ED.

STRENGTHENING NEGATIVES.—At a recent meeting of the American Photographical Society, Professor Seely said, with regard to this subject:—"The negatives developed by sulphate of iron commonly require to be strengthened for printing, while those developed by pyrogallic acid have generally all the density to be desired. There are, however, to balance this failure of sulphate of iron, so many advantages—cleanliness, cheapness, rapidity, evenness, and delicacy of working, &c.—that in America, at least, it has become the universal developer. While abroad pyrogallic acid is still in common use, at an early day we adopted the sulphate of iron; and hence in America the strengthening of negatives being more practised and studied is better understood. Some of the most useful strengthening processes have been invented here. The ordinary strengtheners are chlorides, iodides, bromides, or sulphides. Their action is explained by supposing that the negative element, in whole or in part, combines with the silver of the image, and if the base to which the negative element was combined is insoluble in the fluids present it is also precipitated, and thus further increases the opacity. When bichloride of mercury is used a compound of silver, mercury, and chlorine is left on the plate. When sulphide of potassium is employed, sulphur only is added to the body of the silver. Any of the halogen elements also may be used in the free state as vapours, or in their appropriate solvents, and thus be added to the silver image. On account of its low equivalent we should infer, what our experience confirms, that sulphur will add less strength than any of the other elements which have been used. The prompt action of strengtheners appears very reasonable when we consider that the silver of the image is in an extremely subdivided form, thus presenting the greatest surface for the chemical reaction. The subject so far seems quite plain, yet I am satisfied that a closer scrutiny would show that there is much to be learned. The chemical behaviour of any one of our strengtheners is worthy of further research and careful reflection. Many of the strengthening solutions have a solvent power over the matter of the image. This fact explains the harshness and unevenness of some strengthened negatives. A precipitate is generally soluble in an excess of the precipitant."

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

PRACTICAL SUGGESTIONS.

To the EDITOR.

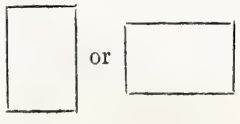
SIR,—Having practised landscape photography for the last four years with tolerable success, and under peculiarly favourable circumstances, I venture to offer the following *practical* suggestions which are not found in any of our "a b c" books, and which may be of use to some of your less experienced readers, who are no doubt preparing their cameras for the spring campaign.

Keep a sort of field book in which to record the particulars connected with each negative. The following is a good form:—

Date.	Subject.	Time of Day.	Ther.	Atmos.	Exp.	Collodion.	Stop.	Lens.	Develop.	Remarks.

Unless you do this, or have a wonderful memory, you will lose the benefit of most of your experience.

Don't be in a hurry in fixing your camera: consider well the *grouping* of your picture, the lights and shadows, and the position of the horizon, and decide whether you will place your plate perpendicularly or horizontally—



The selection of the view is the part of the process which shows that a good photographer is not merely a skilful manipulator.

A clear day, with light clouds, is decidedly the best. For near objects—foliage especially—sunshine gives too strong a contrast of light and shade; but for more distant foliage, sunshine is perhaps preferable.

It is difficult to get a good picture with the sun in front of the camera: a side light—or, as the sailors say, "rather on the quarter"—is best for general effect.

It is a good plan to affix a square wooden shade to the front of the camera, of such size as to obstruct all the light which is *not required* for your picture: it should be coated inside with dull black. This will generally add to the *clearness* of your picture.

Wipe the inside of your camera carefully with a *damp* cloth.

When you place your "dark slide" in position to receive the sensitised plate, put something under the top part of it, so as to raise it to a slanting position, and thus to allow the descent of any drops of the *bath* solution which may be upon the face of the collodion film.

To Expose the Plate in the Camera.—Try to ascertain by experience how long you can leave it exposed without losing the distance—(here you will find the advantage of your field book). Study well the use of stops. You can seldom get the details of a foreground with a very small stop without exposing your plate too long. A larger stop gives you a bolder picture, but at the risk of spoiling the distance: practice alone will teach you how to make a compromise.

In taking a picture of foliage, wind is your great enemy; therefore, when you have drawn up the slide and exposed the plate, stand by with the cap of the lens in your hand to shut out the light if a gust of wind come on, and expose again as soon as it is over. You *cannot* get a good picture if the leaves are in motion, and it is better to run the risk of the plate drying before development. You can find out pretty well by experience how long you can keep the plate without drying between sensitising and developing it.

To Develop the Picture.—If the plate has been subjected to a long exposure on a hot day, it should be re-moistened in some way. Some people dip it again into the sensitising bath: to this plan there are objections. Others place the plate on a level and cover it with distilled water, which is poured into and mixed up with the developing fluid: this is a good plan. But I have generally found breathing upon the collodion film immediately before pouring on the developer sufficient to prevent stains.

You must judge for yourself whether you will develop with pyrogallic acid or sulphate of iron. For a near view, with much detail, in general shadow—as, for instance, a bank with fern roots or grass, or a rock with lichens—I have found a thick bromo-iodised collodion, with a long exposure, developed with iron, and, if necessary, intensified with pyrogallic acid and nitrate of silver, gives by far the best results. In this case the iron brings out details which the pyrogallic acid will not touch, and gives a softer picture; but, for sky and more distant scenery, probably the pyrogallic acid is the best. If you use the iron developer be careful to throw it on rapidly and evenly, and to keep it moving, and to throw it off and wash the plate quickly with water as soon as the details appear, otherwise you are likely to have a stained or muddy-looking picture. If your negative appear to have sufficient intensity after washing off the sulphate of iron, leave it alone; but you will generally require to intensify it with pyrogallic acid and nitrate of silver, in which case be sparing of the nitrate of silver, for you are apt to impair the clearness of the image by using it too strong or too long, and to get a flat picture with no aërial perspective.

Never use doubtful chemicals; and remember that the maxim, "*fiat experimentum in corpore vili*," is not applicable to photography.

To Print from the Negative.—After all this is the most important part of the affair; and it requires much skill, attention, and experience to print a good landscape. A clever printer may make a good picture sometimes from an unpromising negative. If you are indolent, or pressed for time, or find this part of the process tedious and uninteresting, you may send your negatives to a professional printer, and get any number of black or lead-coloured prints, and probably at less cost than you could do them yourself. But if you are an artist you will make the prints *yourself*, and will find much scope for the exercise of your taste and ingenuity in so doing. If your sky be too dark from long exposure, you may paint, with a camel-hair pencil and Indian ink, a few clouds on the *back* of the negative; a few lines near the horizon done in this way will sometimes wonderfully improve a landscape. Some part of your picture may require a longer exposure to the light than the remainder. You may do this by cutting a piece of card-board, so as to expose a part while screening the rest of the picture from the light. In this case keep the card-board in motion

–not fixed upon the printing frame. Or you may "vignette" our picture, which has sometimes a very pleasing effect. There re several ways of doing this.

When your picture is sufficiently printed to be removed from the printing frame, you may produce various effects by partial exposure o the light. You may tone down lights that are too conspicuous, elieve the monotony of a chalky-looking sky, and greatly improve our picture without impairing its identity. Indeed there is much o be learnt and invented in this part of the process; and it is a ity that artistic printing is not more encouraged at our exhibitions, where the authorities insist upon "untouched negatives."

I am inclined to agree with Mr. Thomas that there are few negatives which are not better printed in direct sunshine: of course they require careful watching to prevent their being overdone. Prints made in direct sunshine are more permanent, *i.e.*, lose less in the fixing bath than those taken in the shade or on a dull day.

Your albumenised paper should be used soon after it is dry.

Do not be too sparing of your hyposulphite of soda, but throw away your fixing solution as soon as it has the slightest yellow tinge.

Do not leave your prints so long in the fixing bath as to lose the distance and half-lights.

In washing your prints, if you adopt the plan described in this Journal a short time ago by the Editor (which is no doubt excellent), I recommend an occasional change of *warm* water.

I am, yours, &c., A SUBSCRIBER.

February 28, 1862.

[We heartily commend the foregoing to our less experienced readers: the general tenor of the advice given is sound and thoroughly practical.—Ed.]

PYROXYLINE.

To the Editor.

Sir,—On reading the paper (in your Journal of 15th inst.) by T. S. Davis, *On the Manufacture of Collodion*, I find in one place that which I think must be an error, and further on a quantity given which, if not an error, is so great a departure from all precedent with which I am acquainted, that I take the liberty, as a constant reader, to ask you to set me right on these two points. First, in the second column, page 57, ninth line from the top—"eight fluid *ounces*" I conclude should be "eight fluid *drachms*;" and further on the formula is given for the collodion as follows:—

Ether (methylated)	4½ fluid ounces.
Alcohol	1½ „ „
Pyroxyline	6½ grains.

This gives but one one-twelfth grains pyroxyline to the ounce of spirit, whereas in all formulæ that I have ever seen the quantity given is from four to six grains to the ounce of spirit. What I wish to know is whether the quantity, "six and a-half grains," is an error? or whether it is a speciality of this complete formula that it will give good results with so small a dose of pyroxyline as is stated?

February 18, 1862. I am, yours, &c., THOMAS R.

[We handed your note to Mr. Davis, who has kindly forwarded the following in reply.—Ed.]

To the Editor.

Sir,—In reply to your note of Saturday permit me to say that "eight fluid *ounces*," second column, page 57, ninth line from top, should be "eight fluid *drachms*," as rightly surmised by your correspondent from the context; and that "four and a-half fluid *ounces* of nitric acid" in the first column, page 57, twenty-three lines from the bottom, should be "four and a-half fluid *drachms* of nitric acid." In the formula for the plain collodion "*drachms*" should be again substituted for "*ounces*," as follows:—

Ether methylated (sp. gr., &c.)	4½ fluid drachms.
Alcohol (sp. gr. ·837)	1½ „
Pyroxyline	6½ grains.

Your correspondent will thus see that the quantity of pyroxyline dissolved in each fluid ounce of the *sensitised* collodion will amount to six and a-half grains, when made according to the corrected reading.

Possibly you might notify in the next number of The British Journal of Photography that at the places above referred to, for "*ounces*" should be read "*drachms*," and oblige.—I am, yours, &c.,

Stockwell, Feb. 25th, 1862. THOS. S. DAVIS.

CHEMICAL PROBLEMS.

To the Editor.

Sir,—In answer to my third question, page 35, you say—"To three ounces of albumen and three ounces of water add one ounce of salt." But will this give the proportions I required, viz., three of albumen and one of salt? as, according to Stockhardt, only one-eighth of white of egg is solid albumen, the other seven-eighths consisting of water. If such be the case, will not these seven-eighths be evaporated upon the paper's drying? Can the dried albumenised paper therefore have the albumen and salt in the required proportions?

Will you kindly inform me what is considered to be the atomic weight of albumen, that is to say, of white of egg?

With respect to question No. 1, I will endeavour to state more correctly what I want to know. A paper floated upon a solution of chloride of ammonium, 54 grains to the ounce of water, would require the nitrate of silver solution to be 170 grains of water, to convert the whole of the chloride of ammonium into chloride of silver (taking these numbers as their atomic weights). It is perfectly immaterial to the question what quantity of chloride of ammonium the paper has taken up, or the time required for it to be wholly converted into chloride of silver, as a certain length of time will effect it; but if, instead of a solution of 170 grains nitrate of silver to the ounce of water, I use only an 85-grain solution, will floating for *any* length of time, however long, convert the whole of the chloride of ammonium into chloride of silver? The quantity of chloride of ammonium on the sheet of paper is very very small compared with that of the nitrate upon which the sheet is floating; but will this *quantity* of nitrate make up by longer floating for its *deficiency in strength*? In fact, *must* the two solutions be according to their atomic weights? Q. R.

[You have in the preceding yourself used the word *albumen* in two different senses, but that is immaterial, as we now comprehend your query. Assuming that you want to obtain on the paper one part of a chloride to three of *pure albumen*, you must needs first analyse the white of egg to ascertain how much chloride it naturally contains, as this is variable in quantity. Undoubtedly the seven-eighths of water would be evaporated on drying the paper; but we are convinced that in any formula for a *photographic purpose*, by *albumen* simple white of egg is intended to be implied, consequently for that purpose our original reply would meet your requirements. White of egg being not a definite compound, but a *mixture*, cannot be measured by an atomic weight.

Provided that you have a sufficient quantity of nitrate of silver in the baths, the whole of the chloride in the paper *will* be converted into chloride of silver, by allowing a sufficient length of time for the purpose, almost irrespective of its degree of dilution; but, practically, by allowing a longer time for floating on a weaker solution, the same results do not follow as with a shorter time on a stronger solution, because in the former case a larger quantity of the silver salt is abstracted than is contained in its relative proportions of water, and the actual quantity of surplus *free nitrate* of silver left on the sensitised chloride will be less with the weaker solution—a state of matters which materially modifies the results of printing and toning.

This may or may not be an advantage under certain circumstances. See a paper by M. Reynaud in the current number.—Ed.]

PRINT WASHING.

To the Editor.

Sir,—You will much oblige by giving me your advice on the query as under, in the Journal, at your earliest convenience. I have a cistern of twenty-nine by nineteen inches in dimensions, and a tap with a good supply of water over it. How can I best adapt these to the washing of prints? Of course I do not think of placing prints in direct contact with the lead. I know you have given considerable attention to this subject. I am, yours, &c., ŒDIPUS.

Oxford, Feb. 17th, 1862.

[See a paper on the subject in our number for 15th Dec. last; also two communications from Mr. H. R. Nichols, in current volume, pp. 18 and 36. Have some wooden rods reaching quite across the cistern, and suspend your prints to them so that they may be totally immersed in the water. A syphon also of much larger diameter than the inlet pipe, placed with its bend about an inch from the top of the cistern, may be of use to produce automatic action of emptying and filling; but we consider this far inferior to the plan of lifting out the proofs by the rods and letting them drip while the water in the cisternis changed.—Ed.]

SERUM.

To the Editor.

Sir,—In your issue of February 1st, you give a description of a new mode of printing by development, by M. Oppenheim, of Dresden, which, if in practice it is found to answer, appears to me (an amateur) a beautiful, valuable, and simple method. But, alas! at the first onset, the description of the preparation of the paper does not specify the quantities to be employed. It states that serum of milk prepared by treating scalded milk with tartaric acid for the purpose of coagulating the caseine, is clarified by means of albumen, boiled and filtered.

Will some one of your numerous readers throw a light upon the relative proportions of milk, tartaric acid, and albumen?—I am, yours, &c.,

"NON SIBI."

[The quantity of acid is not material, a very small quantity being sufficient to cause coagulation of the milk. Dissolve your tartaric acid in a little water, and add it drop by drop to the hot milk, stirring all the time until you find coagulation has well set in. If there be a trifle of acid in excess it is of very little moment. The white of one egg will clear a quart of milk well if properly applied; but if you use five or six eggs the result will be the same, as the albumen has to be *coagulated by heat* in clearing the serum, and is removed by filtration. Any cook will show you how to do it.—Ed.]

A GRAND IDEA.

To the EDITOR.

SIR,—As you occasionally have a few telling "tit bits," or, as I may say, photographic facetiæ, I clip the enclosed from the *Northern Daily Express*, February 18th, 1862, considering it to be one of the best pieces of pure writing connected with our art. You will see by this that we in the north are rather a step in advance of our brethren down south. Our townsman can photograph the very *essence* of (soft soap?) ideality. Talk of table-turning and spirit-rapping after this!

Feb. 18th, 1862. I am, yours, &c., NEWCASTLE.

FINE ARTS.

BY ROYAL LETTERS PATENT.

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THE ELPHANTETION PROCESS (Patented),

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"Mr. ——'s best efforts make tangible to our senses the purest essence of ideal beauty."—*Newcastle Guardian.*

ANSWERS TO CORRESPONDENTS.

TRURO.—We have forwarded the note as requested.

TIMID JOE.—You are not obliged to append your name for publication.

TYRO.—Mr. Hughes's *Manual* is a good one, and will no doubt serve your purpose.

B. J. A.—They are all very good; but we prefer those of the second on your list for both purposes.

G. D. M.—Your citric acid is in excess: in this weather one-fourth part of your present quantity is ample.

JOS. BURT.—We will consider the suggestion, but we do not at present perceive how it can be carried out.

GEO. P. suggests that the season tickets for the International Exhibition should each bear a photograph of its owner.

D. C.—Bromide of cadmium, two grains; iodide of cadmium, five grains; odide of potassium, four grains; alcohol, two ounces.

DISAPPOINTED EXHIBITOR.—We have descanted upon the subject in our last leader, which was "at press" when your letter arrived.

M. A. R.—Your paper sensitising bath has no doubt become too weak by use. Replenish it by adding some crystals of nitrate of silver.

GROTIUS.—It is simply an instance of a popular writer treating on a subject with which he is not familiar. He is evidently not a photographer.

H. J. S. M.—It would be premature to make any such announcement just yet, even were it actually decided upon, which we believe has not been done.

NOVICE.—Take some lessons from Mr. Dawson, at King's College. You will find that a much better plan than applying to a private operator for the purpose

FK. R.—We are not acquainted with any photographer of the name you mention—at least so far as we can make out the name, which is not clearly written.

W. S. (Belper).—1. A pair of aplanatic single combinations.—2. Double combination, with diaphragm between the lenses.—3. No! Too slow, and needlessly expensive.

W L. (York).—1. Too long focus; eight inches from back lens would be ample.—2. Fair, but not nearly equal to a good English lens.—3. Good flatted crown will do. Personally we prefer it to patent plate, though it requires more care in printing to avoid breakage in the pressure-frame.

O. S. D.—You may render the albumen very fluid by the addition of citric acid. Allow it to stand for a night, and then neutralise the acidity by the addition of liquor ammoniæ in slight excess. It can be filtered through bibulous paper, and will keep good for some months in a well-stoppered bottle.

F. O. L.—The large proof is insufficiently printed: hence the cold bluish tone and general flatness. The stereograph negative has been over-developed: hence the hard, snowy effect of the lights. The subject of the latter is well chosen, but the former has too little sky and too much of unmeaning foreground.

MOUNTER.—An unexceptionable adhesive material for mounting photographs is still a desideratum. If you are inclined to publish what you find successful we shall be happy to afford space; or, if you intend bringing the article into the market, we shall be happy to test it as you desire, and testify to its efficiency if we can do so truthfully.

G. W. T.—To use opal glass you should prepare the smooth side as for a *dry plate* by any of the ordinary dry processess; then print upon it with a negative, giving rather a *short* exposure. The development should be pushed rather more than for a negative; and, after cleaning with hyposulphite of soda or cyanide of potassium, and being well washed, it may, if desired, be toned with a weak solution of chloride of gold.

ARG. NIT.—We have repeatedly given formulæ for the treatment of residues in order to recover the silver from waste solutions. You will find all you desire in Hardwich's *Manual*, which you mention as being in your possession. It is surely as easy to look into that book as it is to write to us. We are always willing to assist in any real difficulty, but you are not in such a position according to your own showing.

A. COLEMAN.—M. Joubert's method of carbon printing produces the best results that we have seen as regards half-tone, but the *modus operandi* has not been made public.

A MEMBER OF THE NORTH LONDON PHOTOGRAPHIC ASSOCIATION.—You are rightly informed that the presentation print has been *decided on*: the subject, *On the Beach at Lynmouth*—the artist, Francis Bedford. You must recollect that many good copies from one negative take some time to print, and the artist named has many other matters of importance to attend to as well; therefore it is not likely that the copies will be ready for presentation immediately. Due notice will be given when that is the case.

CHIRURGICUS.—When you ask about a *portable* camera, do you mean one light in weight and easy to carry? or do you require it to fold up into a small compass? In our opinion the former is a *desideratum*, the latter of but little importance—especially as you cannot have an effective folding camera unless it is heavier than an effective rigid one. A folding camera is a nuisance in the field: it takes time to set up and to pack away every time you have to shift your position. We have forwarded a note to you addressed simply "Bristol," not knowing your special address.

L. B.—In our opinion the argument held by the advocates of the word stereo*gram* is unsound. Firstly, γραμμα means literally *a letter*, not a drawing. Secondly, if we adopt *stereogram* we ought, in order to be consistent, to say photogram, lithogram, autogram, &c. &c. Now, as the two last-named words—not being Greek words, though derived from that language—were in common use *as English words* long prior to the invention of photography and telegraphy, and further, as *photograph* and *stereograph* were adopted in accordance with existing forms of words, it is rather too absurd to attempt now to revolutionise the nomenclature simply because *telegram* became a necessity for distinction's take.

W. G. G.—Your pyroxyline appears to be very good: you must be sure this is thoroughly free from any traces of acid. The presence of a small quantity of water in collodion is almost a necessity, if you use iodide of potassium—a *sine quâ non*. You cannot do better than follow Mr. Hardwich's formula, viz.:—Take 48 grains pyroxyline; pour on 1½ fluid ounces of alcohol, sp. gr. ·805; then add of ether, sp. gr. ·725, 4½ fluid ounces. For the iodiser, use alcohol, sp. gr. ·816; and dissolve therein, *without heat*, to one ounce of the alcohol iodide of cadmium 9 grains, iodide of ammonium 9 grains, bromine of ammonium 4 grains. The above will do for both purposes. To be added in proportions of *one* to *three* of collodion.

W. DANIELS.—You have no need to deprecate judgment of the quality of the lenses on account of the print enclosed in your note, which shows them to be everything that can be desired. You err in fancying that there is *more* subject in one picture than in the other; but there are parts in each not contained in the other. You need a little farther separation of the lenses. We think if you place their centres three and one-eighth inches apart, you will obtain all you require. Remember you must trim off a portion of your pictures, and you will certainly find three inches of width correspond in the two. You are progressing very well.

To prepare plates to keep for twenty-four hours only, sensitise as usual, drain, then pour along *one edge of the plate* some honey syrup, and make it flow easily, steadily, and regularly in one wave right across the plate: it will drive before it any surplus of the nitrate bath that may be remaining on the plate Let a *portion* of the syrup flow off from the opposite side to that on which it was poured, then restore the plate to a horizontal position and leave it so for at least one minute, then set it up on edge and resting on one angle to drain, the face of the plate being towards a piece of glass against the wall. After it has drained for half-an-hour, remove the last drop of syrup at the lower corner with blotting paper, and the paste is ready for the dark slide.

To make the syrup—Take *distilled* water, say ten table-spoonsful, fresh; liquid honey five table-spoonsful. Make the water hot, and stir together. Filter through filtering paper.

To develop—Immerse the plate for an instant in distilled water; remove it and pour on a sufficiency of pyrogallic acid one grain, citric acid half a grain, distilled water one ounce. Fix with hyposulphite of soda.

*** Several of the preceding replies are in answer to letters which arrived too late for our last issue. Several communications have been delayed by having been sent to our publisher instead of direct to us, as requested.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 162, Vol. IX.—MARCH 15, 1862.

Sensitive Dry Plates.—It is with considerable satisfaction hat we find progress being made towards solving the problem f producing "instantaneous" impressions upon dry plates. 'hat this has been done occasionally we have several times een able to bear testimony from actual inspection of the nega- ves; but although we do not ascribe such results merely to rtunate accidents, the conditions requisite to ensure success this direction have been, until lately, so little known, hat nothing like certainty can be said to have existed ith respect to them. We have recently had an oppor- unity of examining a number of proofs from stereoscopic egatives, taken upon some of Dr. Hill Norris's dry plates, hat evince the existence of a very exalted degree of nsitiveness in the prepared plate before exposure, inasmuch s we have drifting clouds, waves of the sea, vessels afloat, eople in motion, &c. &c., all delineated more or less perfectly— ot as yet equal in manipulation to some from wet plate nega- ves which we have very lately noticed in these columns, but rtainly exhibiting in a manner not to be doubted that a very arked advance in exaltation of impressionability in a short ace of time has already been accomplished. We know that veral sagacious experimentalists are at work upon this sub- ct; and we hope that by the close of the forthcoming season e may be able to announce the possibility of taking, with rtainty, properly lighted subjects upon dry plates of con- derable size with the exposure of a portion of a second of time.

Dr. Taylor's Dioramic Effects.—In another column we ive Mr. Mactear's description of Dr. Taylor's dioramic ap- aratus as applied to the exhibition of photographs; and we o so with the greater satisfaction because, hitherto, in con- equence of an imperfect comprehension of the arrangements dopted (with which we became acquainted only through the ages of the Glasgow *Daily Herald*, kindly furnished by Mr. Macnab—see p. 25), we have inadvertently withheld a proper eed of acknowledgment to Dr. Taylor for the great ingenuity isplayed by him in his clever contrivance.

Our thanks are due to Mr. Mactear for his expression of the ollowing conviction, viz.—"The Editor surely has not fully omprehended the description of it, or he would not have at- empted to pluck the laurels from another." While we regret hat he should have adopted the latter clause in the preceding uotation, which we extract from his paper, we can honestly affirm —firstly, that we quite misunderstood the mode of application of he cloud effects, &c.; and secondly, that we had no idea of ppropriating any laurels, much less those belonging to another. Our remarks upon the subject were very few (as our readers will erceive by turning to p. 25 of the current volume), and they vritten under a misconception.

It sometimes happens that an original idea occurs in more uarters than one, so that we have occasionally to point out his fact to a second or third independent observer in conse- uence of prior *publication*, though not necessarily of prior *observation;* and, from a want of correct information, and labour- ing under a misapprehension, we concluded the present case to have been an instance of the kind. We are, however, pleased to be able to withdraw such an opinion, and cheerfully to acknowledge our belief in the originality of Dr. Taylor's contrivance; also that he has been the first to make this plan public. His plan we now understand to be as follows, namely:— Semi-transparent glass pictures, slightly tinted, illuminated by light *reflected* from a surface painted to represent clouds, &c., the reflecting surface being at some distance behind the pictures and out of the focus of the eye-lens; the surface representing the clouds, &c., being for convenience wound round a cylinder, which may be revolved to impart the effect of movement to the clouds; and, lastly, the reflecting surface being also semi-trans- parent, so that additional effects may be introduced by lighting *it* also from behind.

THE CHEMISTRY OF THE OXALATES OF IRON.

By Emerson J. Reynolds.

There are few sciences which in their infancy have attracted so large a share of public attention as photography. This highly pleasing combination of science and art has won its way with a rapidity unexampled in the history of scientific progress; and yet it is not difficult to understand how it is that such has been the case, when we consider how many powerful incentives were and are at work—all tending in the one direction—to aid in its advancement.

From the earlier time of Fox Talbot down to the present day pho- tographers might readily be grouped into three great classes. In the first class we have the professional photographer, who makes the practice of the art his means of subsistence, and under the wholesome influence of commercial competition does all that lies in his power to produce pictures as near perfection as possible—in many cases, doubtless, influenced more by real artistic feeling than by the mere hope of pecuniary reward. Again, there is another class—and a very large one—I mean those who, having time and probably money at their disposal, practise the art simply as a delightful and highly intellectual amusement: to these *amateurs* photography owes much of its present position. And, finally, we have the true philosopher becoming fascinated, and endeavouring to bring to bear the principles of exact science in order to aid in the general onward movement. We have thus three incentives to future progress, viz., great commercial impor- tance, the activity of enthusiasts, and the application of correct scientific principles to the explanation of known facts.

However, the reader may naturally ask "what has all this to do with the chemistry of the oxalates of iron?" It has this much to do with the subject of the present paper that my previous remarks enable me to define clearly to whom I wish to address myself more particularly. It is to be remembered, therefore, that the present paper is only written for the purpose of conveying some information respecting the *oxalates of iron* to those members of the first and second classes who may wish to prepare these salts with a view to testing their photographic capabilities. To the scientific chemist I cannot hope to convey much that is new.

In the following remarks I have thought it better to describe the mode of preparation, and some of the principal properties, both of oxalic acid and of the hydrated peroxide of iron, as they

are connected directly or indirectly with the preparation of all the compound salts.

OXALIC ACID.

Composition.—The anhydrous acid is represented by the formula $C_2 O_3$. It is only known to exist in combination with water or some other body capable of playing the part of a base. The formula for the crystallized acid is $C_2 O_3 HO + 2$ aq.

Equivalent.—63.

Preparation.—Oxalic acid is prepared artificially upon a large scale by the oxidation of starch, sugar, or other analogous organic substances, by nitric acid. The process which yields the best results on the small scale is that of M. Schlesinger, which is recommended by Berzelius. It is as follows:—Four parts of dry loaf sugar are placed in a flask, and thirty-three parts of nitric acid of 1·38 sp. gr., poured in. The whole is now heated until all effervescence ceases. The solution is then placed on a water bath, and evaporated to about the one-sixth of its original volume. The acid crystallizes out on cooling the liquid, and must be purified by re-crystallization. A careful manipulator will readily obtain a yield of acid corresponding to rather more than half the weight of the sugar originally employed.

Properties.—As thus obtained, oxalic acid crystallizes in transparent four-sided prisms, which are soluble in 8 parts of water at 60° F., and in their own weight of boiling water: they are likewise soluble in spirit. The aqueous solution has an intensely sour taste and powerfully acid reaction, and is, moreover, highly poisonous.

With regard to the salts formed by the union of oxalic with metallic oxides, it may be generally stated that the oxalates of the alkalies are soluble, while those of the alkaline earths and of the protoxides of the heavy metals are almost all insoluble: again, the oxalates of many of the peroxides of the metals are either very soluble *per se*, or become so by the addition of an excess of acid. There are several exceptions to this rule, but generally it will be found correct.

HYDRATED PEROXIDE OF IRON.

Composition.—$Fe_2 O_3 + 3 HO$.

Equivalent,—107.

Preparation.—Many processes are known by means of which this oxide can be prepared with more or less convenience, and likewise in varying states of purity; but I will only mention one here, which, when properly performed, leaves but little to be desired in point of easy manipulation and purity of product. However, to secure this desirable result, great care should be taken in the selection of materials, more particularly of the protosulphate of iron, which should be pure, and not the rough green vitriol of the shops. Take of

Protosulphate of iron	8 ounces.
Pure sulphuric acid	6 fluid drachms.
Pure nitric acid	½ a fluid ounce.
Distilled water	12 fluid ounces.

Caustic liquor of ammonia, *quant. suff.*

To ten ounces of the water add the sulphuric acid, and in the mixture, with the aid of heat, dissolve the sulphate of iron, mix the nitric acid with the remainder of the water, and add it to the solution of sulphate. Next, concentrate by boiling, until the liquid passes from a dark to a red colour, with the evolution of much gas.* Now dilute with water, and add the ammonia in excess: the hydrated peroxide will be thus precipitated, which must be thrown on a calico filter, and well washed with boiling water; it should then be allowed to drain, and preserved in the moist state.

PEROXALATE OF IRON.

Composition.—Neutral salt, $Fe_2 O_3, 3 C_2 O_3$. The formula for the acid salt has not been correctly determined.

Equivalent.—188.

Preparation.—I prepare a strong solution of the salt in the following way:—Take of

Oxalic acid	2 ounces.
Distilled water	8 fluid ounces.

Hydrated peroxide of iron, *quant. suff.*

The oxalic acid is placed in a porcelain capsule with the water, and heat applied until the acid is completely dissolved: when this is accomplished, the peroxide of iron is gradually stirred in, little by little, until solution ceases to take place. The mixture is now filtered from the excess of peroxide, and carefully preserved, away from the light.

*The gas evolved is the peroxide of nitrogen, which forms a definite compound with protosulphate of iron, but is insoluble in solution of the persulphate; so that, at the moment of the complete conversion of the former salt into the latter, the gas is suddenly liberated.

Properties.—It is to be remembered that the above solution contains the neutral peroxalate dissolved by free acid, any unnecessary excess of the latter being avoided by the mode of preparation. The neutral peroxalate is a lemon-yellow, almost insoluble powder. The solution, in excess of acid, possesses an intensely sweet taste, and, as prepared by the above method, is of a deep brown colour: if the solution be diluted it is a greenish-yellow.

The most remarkable property which is presented by this solution is that of being immediately reduced under the influence of the solar rays. If exposed to direct sunlight the liquid will be observed to lighten in colour, and, at the same time, carbonic acid gas will be seen rising in little bubbles; but *no precipitate will be observed for some time.* However, after a few minutes, a yellow crystalline powder will gradually deposit, and the action will continue until all the peroxalate is decomposed.

If paper be floated on the surface of the peroxalate solution for a few minutes, then dried in the dark, and exposed under a negative to light, blackening will be observed to have occurred on those parts unprotected from the light. If the print be now washed well in water, and then placed either in solution of ammonio-nitrate of silver, or solution of the red prussiate of potash, a black or blue picture will be respectively obtained. On carefully examining the picture it will be found that the details are very deficient. It will be remembered that when the solution of peroxalate is placed in the light, though gas is given off, yet it is only after some time that the protoxalate of iron is deposited, and then it appears as a *crystalline* powder, giving the idea that it had separated from a saturated solution. I found on further experiment that such was really the case, the peroxalate having dissolved the protoxalate immediately on being formed, and therefore not having allowed it to precipitate until a saturated solution was formed. On this principle the destruction of the half-tones is readily accounted for. The remedy for this serious evil consists in the use of the salt next to be described, instead of the plain peroxalate, as a sensitiser.

AMMONIO-FERRIC OXALATE.

Composition.—$Fe_2 O_3, 3 C_2 O_3 + 3 (N H_4 O, C_2 O_3) + 6 HO$.

Equivalent.—428.

Preparation.—This beautiful salt may be easily prepared in the following way:—Take of

Crystallized oxalate of ammonia	437 grains.
Oxalic acid	386 „
Distilled water	6 fluid ounces.

Hydrated peroxide of iron, *quant. suff.*

Place the oxalic acid, oxalate of ammonia, and water together in a porcelain capsule and apply heat. When the temperature of the liquid is raised nearly to the boiling point, stir in some of the oxide of iron. This, by uniting with the acid oxalate of ammonia already in solution, forms the very soluble salt which it is our object to prepare, and thus permits the solution of the excess of the rather difficultly soluble acid oxalate of ammonia, which is much less easily dissolved than the neutral oxalate. When no solid salt remains, the clear liquid is kept at the boiling point, and the hydrated peroxide stirred in until it ceases to be dissolved. A solution will be thus obtained which may be directly used to sensitise paper with; or, if it be desired to obtain the ammonio-ferric oxalate in the solid form, it has only to be evaporated to a small bulk, when beautiful green crystals will separate.

Properties.—The double oxalate of ammonia and peroxalate of iron, prepared as above directed, remarkably resembles in its crystalline form chlorate of potash, though it may be obtained in small slightly rhombic octohedra. The salt, when exposed to light, turns yellow, by the formation of the oxalate of the protoxide: this change is especially quick in the powder, the greenish-yellow colour of which changes almost instantly to an ochre-yellow in sunshine. The aqueous solution, likewise, when exposed to light, gives off carbonic acid gas, becomes decolourised, and deposits ferrous oxalate, in the form of a yellow powder. This salt dissolves in rather more than its own weight of water at 60° Fahrenheit, and in ·79 parts at the boiling temperature, forming a solution of a beautiful emerald green colour.

The double oxalates of potash or soda with the peroxalate of iron are prepared in a precisely similar manner to the above salt, though both are much less soluble in water than the ammonia compound, and, moreover, are not nearly so well adapted to photographic use as the latter.

The description of these oxalates would hardly be complete without reference being made to the protoxalate of iron. It is the result of the action of light on the foregoing salts, and the study of its properties and relations is, therefore, a matter of some importance.

PROTOXALATE OF IRON.

Composition.—Fe O, C_2O_3 + 2 H O.

Equivalent.—90.

Preparation.—This salt may be formed by precipitating a solution of protosulphate of iron by means of oxalate of ammonia, or by the actinic decomposition of any of the preceding compounds of the peroxide.

Properties and Uses.—The protoxalate of iron, as prepared by either of the above methods, is a lemon-yellow powder, which, if deposited from a solution of the peroxalate, is crystalline. It is insoluble in water or excess of oxalic acid, though, as I mentioned before, it is soluble in solution of the peroxalate.

When treated with solution of red prussiate of potash it first becomes green, and then blue. Treated with caustic ammonia, it first becomes greenish-white, then green, until it finally becomes brown, owing to the protoxide precipitated absorbing oxygen, and being converted into the peroxide of iron: if gallic or pyrogallic acid be added before the change is quite completed, a brownish-black or inky colour will be the result. According to my experience the best and most permanent black is obtained by treating the protoxalate with very dilute ammonio-nitrate of silver: the deposit consists of equal equivalents of metallic silver and peroxide of iron, oxalate of silver being simultaneously formed, which is dissolved by the ammonia of the developer. If the protoxalate be ignited in the air, the organic acid will be burnt off, and the residue will consist of pure peroxide of iron, which, in consequence of its extremely minute state of division, may be used with advantage instead of tripoli, or in grinding lenses, as, if ordinary care be taken in its preparation, there is no possible chance of gritty particles being present.

ON BURNT-IN PHOTOGRAPHS IN ENAMEL COLOURS*

By F. Joubert.

Having been invited by our excellent Secretary, Dr. Diamond, to exhibit, this evening, some specimens of my photographic transfer on glass, in enamel colour burnt in, so that a novel application of photography might be placed under the notice of the Society, I shall endeavour, briefly, to give some information respecting the process itself, and to point out in what direction it might receive great development.

But, previous to entering into the subject immediately before us, I would take this opportunity of casting a retrospective glance at the origin of the discovery of photography, having had the advantage of watching the progress of the invention almost from the very first essays of the inventor.

Although not intimately acquainted with Daguerre, my late and regretted friend the Chevalier Bouton, his partner at the Diorama, first mentioned to me the subject which at that time engrossed Daguerre's thoughts almost exclusively; and one of the first specimens brought under my notice was a portion of a figure with draperies of such exquisite refinement and definition of texture as to cause a feeling of perfect admiration amongst the few friends to whom Daguerre showed it.

It is well known that before his name became associated with the production of *sun-pictures*, as they were first designated, Daguerre had acquired considerable repute as a landscape painter, and he had exhibited at various times, amongst other fine works, some interior views of old buildings, which denoted in the artist, besides other great qualities, a complete understanding of the theory of light and shade as applicable to a picture. Daguerre, being ambitious of spreading his works upon a larger scale, conceived the idea of attaining a perfect representation of natural objects, the size of life, lighted as though they were the real scenery, through an arrangement or system of windows much the same as that in use for lighting panoramas; but he painted a picture upon a flat plane instead of a circular one, by means of which he was enabled to introduce side-lights also with great effect.

The success of the Diorama in Paris was immense, and many persons may yet remember, among other pictures, one representing the Valley of Unterseen in Switzerland, and a view of the Royal Chapel at Holyrood, both of which were, I believe, exhibited later in London at the Diorama in Regent's Park.

Daguerre had for many years been in the habit of using both the camera obscura and the camera lucida. The first-named one was particularly serviceable to him in obtaining an accurate representation of the scene he required to paint for his diorama, with all the gradation of light, and he used a camera obscura of very large proportions for the purpose. Many a time in observing upon the white drum in his dark room the beautiful definition of objects outside, which the opening of the room-door caused to disappear immediately, Daguerre had been heard to exclaim—"Ah! that means could be found to fix such an image!" and with his ardent and enterprising mind he had imagined to try the effect of a sensitive paper, without, however, alighting upon the right medium. He tried several agents, and actually by accident obtained, one day, a faint outline of objects upon a sheet of paper, which outline remained some little time, even when exposed to the light, before it passed away. This was assuredly an important step in the right direction; but after trying many experiments, rejecting them, resorting to new ones day after day, and having already, it must be said, far progressed towards the discovery of the object he had in view, a circumstance occurred which was destined to have a great influence in bringing the invention to a positive result. Daguerre called one day on a well-known optician of whom he had purchased his instruments, and to whom he had, from time to time, made a confidential communication of the progress of his researches. The optician said to him—"I believe, M. Daguerre, I know a young man who is trying for the same thing that you are trying for: he is extremely clever, and I should much wish you to know him: he might perhaps be of use to you." This was M. Niépce.

Daguerre was so struck with the results that Niépce had arrived at, that he offered to him to combine their efforts, and very soon after the invention was brought before the public by the great astronomer Arago in a paper read at the Academy of Sciences; and shortly after this, in a series of experiments made by Daguerre himself in a government office, where a vast and select assemblage had been invited, these experiments were perfectly successful. The French Government rewarded Daguerre nobly for his discovery, and also acknowledged the claims of Niépce by granting him a pension for life.

Daguerre's invention, ingenious as it is, would scarcely have led to the immense development that we now witness in photography. By a very singular coincidence, about the same time, and perfectly unknown to Daguerre, Mr. Fox Talbot, in this country, after having worked alone with great perseverance and courage, brought out the "Talbotye," which has changed its name and become better known as "Photography."

It was very natural to expect that many persons, considering the beautiful results of the new discovery on the one hand and the admitted want of permanency of the photographic prints on the other, should exert themselves to find a mode of giving durability to that which, from its transient nature, was undoubtedly destined to perish sooner or later. The Daguerreotype image being liable to be affected by damp, or by rubbing off, had to be carefully protected by a piece of glass being fastened in front of the image: the Talbotype proofs also were at first frequently found to fade away after a short time if exposed to the bright light.

A better method of fixing the proofs is now generally adopted; but who can tell for certain how much of the best fixed photographic prints will remain on the paper twenty years hence? A mode of preserving the photographic image intact from any atmospheric influence was generally wanted; and, soon after the introduction of the method for taking a photograph upon glass by means of the collodion process, many were the attempts at fixing the image by fire, under the notion that the metallic principle of the nitrate of silver would run into the substance of the glass when heated sufficiently, so as to combine with the glass itself, and retain the image when looked at by transmitted light.

This, however, was not the case. 1. Although some portion of the silver was retained in a yellow tint on the glass when taken out of the kiln, the greater portion of the photograph had disappeared; for the organic substance of the collodion was burnt off, and left no trace on the glass in many instances. It was thought that by fixing another piece of glass in front of a photographic image copied in a *positive* by the albumen or other process, a certain degree of permanency could be obtained, and some very interesting results were arrived at by that means. Then the usual mode of printing on ceramic substances was also tried, but failed for want of a medium to apply the pigment required for printing off. In the manufacture of earthenware, as every one knows, the image to be applied to decorate the ceramic wares is first printed from an engraved copperplate on what is called tissue-paper, or very thin paper, in vitrifiable colour or colours, and applied before the colour has had time to set upon the objects to be decorated. The same process has been in use for decorating glass; but the expenditure of time and money required to obtain first an original plate stood in the way of any great progress being made in that direction.

* Read at a Meeting of the Photographic Society, March 4th, 1862.

Having been for many years professionally acquainted with printing in connexion with the fine arts, and having observed the immense development the new art of photography has taken, and the large field it has opened for representing all sorts of subjects—of animated as well as still life—it occurred to me that if a means could be found to print the photographic image on glass as easily as it is done on paper, and through the agency of some chemical composition which would admit of employing ceramic or vitrifiable colours, and burning them in, a great result would be attained, and a new and considerable branch of industrial art might thereby be opened. Considering the numerous and various attempts which have, from time to time, been made to introduce a substitute for glass painting in the decoration of houses, I believe it can be said that a want was generally felt for supplying the growing taste for pictorial decoration; for glass painting is an expensive process, and requires also a considerable time to obtain a perfect result.

The invention which occupies us now is *resting* upon this singular fact, that all saccharine or sticky substances seem to be easily absorbed by light. In consequence, a certain convenient solution being prepared, sensitive to the light in order to obtain the image, photographically; if to this solution there could be added a principle which would combine the property above alluded to with the sensitive property necessary to obtain the facsimile representation of the object to be copied, then the application of an enamel colour of pigment would become an easy and almost mechanical matter. To render this more easy of comprehension I shall now read that part of my specification which relates to placing the image on the glass and fixing it by fire:—

For this purpose, I proceed in the following way:—A piece of glass, which may be crown or flatted glass, being selected as free from defect as possible, is first well cleaned, and held horizontally while a certain liquid is poured on it. This liquid is composed of a saturated solution of bichromate of ammonia in the proportion of five parts, honey and albumen three parts of each, well mixed together, and thinned with from twenty to thirty parts of distilled water, the whole carefully filtered before using it. The preparation of the solution, and the mixing up with other ingredients, should be conducted in a room from which light is partially excluded, or under yellow light, the same as in photographic operating rooms, so that the sensitiveness of the solution may not be diminished or destroyed.

In order to obtain a perfect transfer of the image to be reproduced, the piece of glass coated with the solution, which has been properly dried by means of a gas stove (this will only occupy a few minutes), is placed face downwards on the subject to be copied, in an ordinary pressure-frame, such as is used for printing photographs.

The subject must be a positive picture on glass, or else on paper rendered transparent by waxing or other mode, and an exposure to the light will, in a few seconds, according to the state of the weather, show, on removing the coated glass from the pressure-frame, a faintly-indicated picture in a negative condition. To bring it out, an enamel colour, in a very finely divided powder, is gently rubbed over with a soft brush until the whole composition or subject appears in a perfect positive form. It is then fixed by alcohol, in which a small quantity of acid, either nitric or acetic, has been mixed, being poured over the whole surface and drained off at one corner.

When the alcohol has completely evaporated, which will generally be the case in a very short time, the glass is quietly immersed, horizontally, in a large pan of clean water, and left until the chromic solution has dissolved off, and nothing remains besides the enamel colour on the glass: it is then allowed to dry by itself near a heated stove, and when dry is ready to be placed in the kiln for firing.

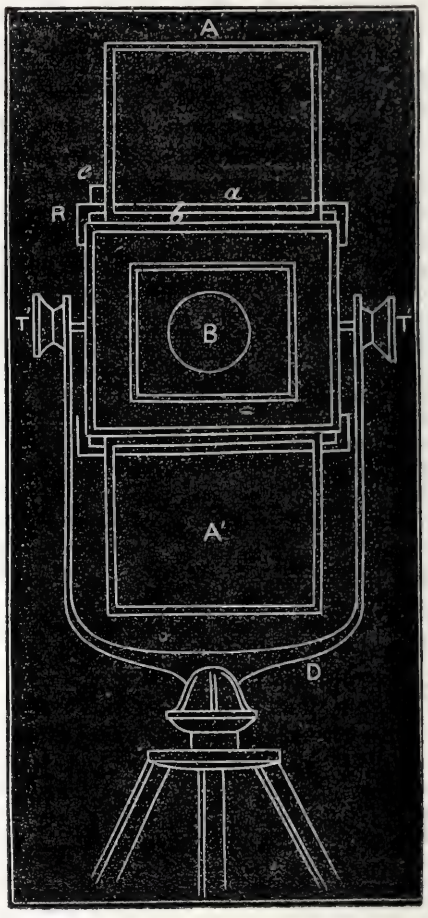
DESCRIPTION OF THE AUTO-POLYGRAPHIC CAMERA

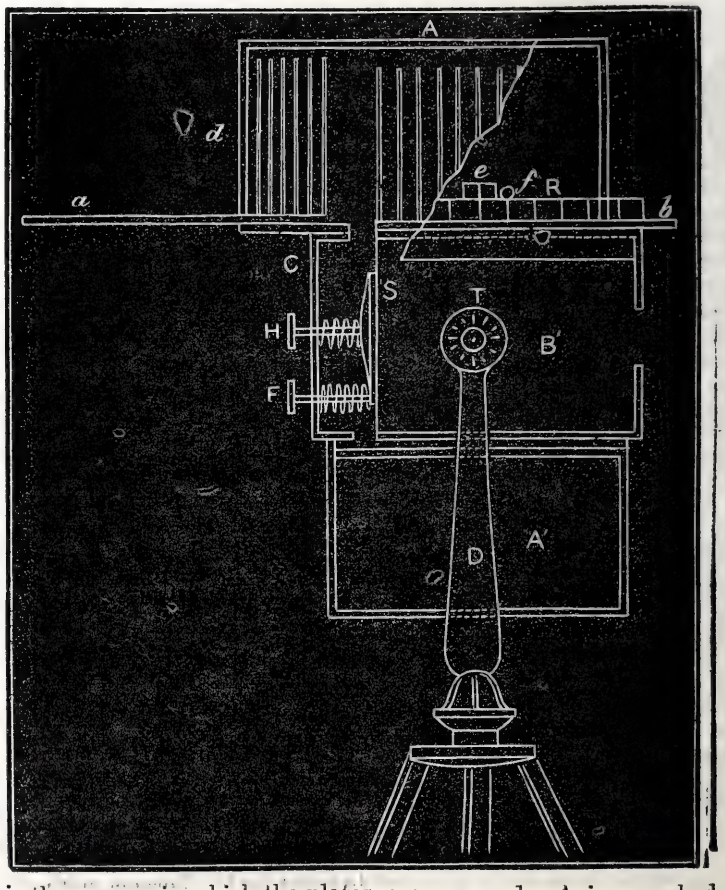
Invented by M. Leon Vidal,

And Exhibited at the Marseilles Photographic Society, February 28, 1862.

This apparatus I have designated auto-polygraphic from its being able to produce without any addition a considerable number of views. It is also particularly portable. Forty-four prepared plates contained in two racked boxes, arranged above and below the camera, can be successively brought into the focus of the lens and returned to their places; or, even if but one box contains the prepared plates, those impressed can be passed into the lower one. The apparatus intended for views upon quarter-plates is also applicable to the production of stereographs, either on separate or double-sized glasses.

The cuts which accompany this description give an idea of the apparatus.





B is the camera in which the plates are exposed. A is a racked box sliding smoothly in grooves on the camera B. This box is closed by two sliding lids, *a* and *b*, opening in opposite directions;

the lower lid *b* having a long narrow opening, allowing the glasses to pass through when brought opposite to the groove for exposure S fixed in the dark slide, in which also the focussing screen works. The lid *a* carries a graduated scale R, equal in number of gradations to the plates which the box will contain.

In order to operate and expose, for instance, the seventh plate we slide out the lid *a* in this position, and draw out completely the lid *b*. The plate then being no longer retained falls on the upper surface of the camera. To bring it in correspondence with the opening in the *chassis* it is sufficient to slide the box A in its grooves until the little knob *f* which moves the index *e* is on the seventh division of the graduated scale placed on one of the grooves on the side of the camera; immediately the glass falls into the *chassis* where it is in focus. A spring F, which corresponds with an external knob, retains it at any desired height; another spring H, which can be tightened or loosened at will, ensures the glass being brought exactly in focus against the rabbet S, as soon as it has fallen into its place.

After exposure the camera is turned over on the two axes T, sustained by a vertical crutch D, which itself turns on a cone by which a very light travelling foot is terminated, and the box A then occupies the lower position; the openings being brought to coincide by the assistance of the graduated scales, it is sufficient to draw back the knob H to release the glass, which falls back into its place.

When it is desired to cause the plate to fall into the other box situated below, the turning over of the camera is needless; it suffices, after having conveniently arranged the lids and the position of the box A', to draw the nobs H and F; the plate will then fall into it.

By the aid of properly graduated edges this apparatus is easily adapted for taking a series of panoramic views, the motion in every direction permitting views of all kinds to be taken either horizontally or perpendicularly.

The index points out always the number of plates already impressed without its being requisite to make memoranda or to remember the number at which we left off.

The apparatus has been protected by a patent.

RECOLLECTIONS OF AN AMATEUR PHOTOGRAPHER IN PORTRAITURE.*

By Noel E. Fitch.

Some few years since I started one morning, a full blown photographer, with a complete set of apparatus of the value of £3, and, judging from the *number* of gentlemen who have commenced their photographic life with this most wonderful stock of appliances, I presume the originator of the idea of a "complete set" must now be reposing from all earthly toil on a handsome fortune. You all, gentlemen, recollect with what delight you proceeded to take your *first*, your maiden picture: most of you, I doubt not, have it still. *My* first production consisted of a quarter-plate portrait of a most obliging friend, who kindly consented to be taken in the garden of my house: the background is a brick wall. It was raining steadily at the time, and, as the experiment was of considerable duration, I am inclined to think the operator had the best of the fun. Failure now followed failure, collodion wasted, baths spoiled, accidents happening, instruction books reading, and so months passed by, until by experience acquiring some dearly bought knowledge, I have arrived at that condition when, if I cannot *take* a good negative, I fancy I can recognise one when I see it, and appreciate the trouble, adjustment, nicety, and balance of each and everything, from the plate itself to the final washing requisite in its production. However, in due course the poor "complete set" was at length discarded; and, after a series of annoyances and disappointments with respect to lenses, having possessed myself with cheap instead of good ones, I equipped myself entirely afresh, built a glass-room, and entered heart and hand into the delightful amusement of taking *my* friends' and *their* friends' portraits.

Individually, I never could see the "fun" of being taken, but my hobby having brought me into contact with a great number of people, I have come to the conclusion that with some the desire to see themselves represented in chloride of silver becomes absolutely a disease. I was once taking the card portrait of a gentleman, and after having taken him thrice was proceeding to wipe my hands as a signal that I had completed the operation, on seeing which he informed me that *he* was not tired and was willing to be taken in a dozen different attitudes. I pleaded lack of time, another opportunity, &c., and thus got out of the difficulty, evidently much to his disappointment, as he was in full uniform, being a member of a rifle corps. He subsequently met me, reminded me of my promise, and I then had to take him thrice again, and was compelled to tell him at last that I could do no more. On another occasion a young lady had the honesty to tell me that to her the operation was a pleasant and agreeable one, and begged me at any time that I might be in want of a sitter, either for experiment or a study, to send for her, and she would be delighted to come. There were, however, certain facial objections to my so doing, and consequently I have not availed myself of her offer.

Another young lady was so determined to have herself taken that although suffering severely from the toothache, she first paid a visit to the operating-room of a dentist, and from thence immediately came to mine. This portrait does not represent a happy cast of countenance; in fact, I may assert that out of the very many portraits that I have taken I have never yet met with one sitter who *disliked* the *operation*, and but few who had much consideration for the *operator*; for, whether practised as a profession or as an amusement, too much of it becomes irksome, especially with the thermometer showing 90° of heat in the dark room.

I can scarcely believe that when people are having their portraits taken they give a thought that the operator, when focussing, can see them and their actions most distinctly on the greyed glass; for, if such a consciousness pervaded them, how much amusement we amateurs and professionals would lose! Desiring to get a certain effect of light and shade on the face of a gentleman, I desired him to look and turn his head somewhat to the left, but as he was slightly deaf I had to suit the action to the word by going up to him and with my hand turning his head in the direction I wished it to remain; but I had no sooner enveloped my head in the velvet than curiosity overcame his prudence, and round came his head to look into the lens of the camera. This operation being repeated several times I was at length, of necessity, compelled to take him "full face" and thus spoil the general effect of the portrait. I assure you it amounted at last to the ludicrous to see the old gentleman so persistently gratifying his curiosity, although it has since occurred to me that a certain amount of fear might have been mixed up with his feelings on account of the novelty and formidable appearance of the instrument before him.

It is scarcely fair to reveal the secrets of the camera with respect to the fair sex; but, as by far the greater number of my young lady sitters repeat their visits only to have their new dress taken, one cannot help taking a very long time in focussing for the purpose of watching how very particular they are in the *set* of it. How that stray piece of trimming is brought forward; how that part is arranged or set out; the head daintily felt all over to ascertain that no trace of disorder is there either in the net, hair, or ornament; and then the final effort to compose the entire person and dress for the most pleasing attitude and expression. Then, again, if your sitter is possessed of great personal attractions, you can gaze your full upon the charming picture presented to you on the screen (notwithstanding she is standing on her head), in all the perfections of colour and rotundity, and only regret when the plate has to be inserted which *as yet* fails in copying so beautiful a shadow in all its integrity of life and colour. It is these little episodes in portraiture that give so great a charm to it in the eyes of an amateur.

Our worthy treasurer, Mr. Howard, in a paper read by him some time since, portrayed with vivid truthfulness some of the manipulative difficulties of an amateur photographer in portraiture as distinguished from the easy pleasure of those gentlemen who prosecute that part of the art represented by the various dry processes; but while he told you of baths neglected, and glasses to be cleaned, developer to mix, and the sundry other calls upon the amateur, he omitted to mention to you—on account, I believe, of his limited experience in the matter—a most serious and destructive difficulty applicable, I may almost say exclusively, to the practice of an amateur—I mean the familiarity which exists between the amateur operator and his sitter. This may or may not have occurred to other gentlemen, but, personally, I affirm it is a great drawback to my success and tries my temper most dreadfully. It may be taken as an axiom that without patience there can be no successful photographer; for, to attempt to take a picture of any sort without a large share of it in your composition is in my opinion simply folly, and in scarcely any science does the motto that "Patience and perseverance overcometh difficulties" apply so forcibly as to photography. From beginning to end it is the same: success or non-success, the same thing applies: each step we take is one in which we have identically, some time or other, failed before. Now the light is bad: how patiently we try to use what there is, or wait with equal calmness for a better! Now a dirty

* Read at a Meeting of the South London Photographic Society, March 13th, 1862.

plate; now badly exposed or developed; or the front toned, fixed, or washed imperfectly. Still we go on, and the thousand and one difficulties which we *all* experience more or less are usually successfully surmounted simply by patient determination.

But to me the greatest—in fact the insurmountable—difficulty is the friendly sitters who honour an amateur by *being* taken. With gentlemen who practice the art as a profession there *is not* this difficulty to contend with to anything like the same extent. I have observed (for I have the *entrée* to several studios) that the sitters are for the most part placid, quiet, and obedient: the operator does with them what he will, and their dismissal takes place the moment he informs them of his success. Any *pose* that he thinks artistic or elegant to that will his sitter submit without a murmur; and, even if they place themselves in some eccentric or particular position, a little polite and judicious management soon sets things straight, and the artist nearly always has his own way. That occasionally frumpy and disagreeable people do enter glass rooms there can be no doubt; but the quietude that usually reigns there subdues them mostly, and in ninety-nine cases out of every hundred satisfaction if not felt is at least expressed. I have seen the case frequently of people who have lost their temper in the waiting-room calmly regain it under the mesmeric influence of a Ross or Dallmeyer lens. That momentous second when the cap is removed from the lens must, I suppose, have something to do with it; for, when you come to think, it is really a serious question whether you are to be represented with a scowl upon your face or with all the calm benignity of your better-tempered self. With amateurs, however—or rather in my individual instance—the case is different. My sitters care nought for me, will not be posed, insist on moving, nay, even speak during the operation—treat the whole affair as a good joke, imagine that each failure caused by themselves is my amusement, and usually wind up the entertainment by asking for impressions by the dozen. I assure you this is no romance. It is purely the fact; and did I choose I could call upon a gentleman now present to bear me out in the assertion. Curiosity leads some to open the door of the dark room to find out what I am about during that most critical of all periods, development: others remove negatives, recently taken, from the rack on which they are placed to dry, and, by incautiously touching, spoil them: all complain of the heat; and the last question is "When can they have the copies?" You will have the kindness to remember that I do not exactly complain of this. I am only sometimes a little annoyed that I am not allowed to take my friends my way, instead of being compelled (out of politeness, I must say) to take them their own; for I recently took the card portrait of a gentleman, by profession an artist, engaged on the leading illustrated paper of the day, and whose occupation consists in representing people with elegance of appearance and easiness of pose, who selected for himself the most eccentric, if not the most inelegant, position it is possible to imagine; and, notwithstanding I represented this to him in language perhaps more forcible than refined, he insisted on retaining his self-chosen attitude, asserting as a reason for so doing that it was "characteristic of himself." I need scarcely tell you that I had no pleasure in taking the negative, or that an accident happened to it in the printing-frame. I console myself somewhat, however, with the knowledge that the obligation is mutual, for if I take any friends *con amore* they supply me with sitters; but still people should remember that amateur photography is not the cheapest hobby a man can amuse himself with, and they should be somewhat moderate in their demands for impressions.

A friend of mine having a relation, an officer in a cavalry regiment, asked me if I would kindly take his portrait: of course I consented to do so, and took a very successful one. The sitter was a very good one—quiet and still, with a face even in repose thoughtful and expressive; and altogether, it being a very good day, the picture was liked most immensely. Fifteen impressions from this half-plate did I give, and then was asked for more. This I playfully declined to do, but forwarded the negative to my friend, with instructions as to where any number of copies could be obtained by the very simple process of paying for them. I could give you numerous instances of this sort of thing—this want of consideration towards amateurs generally, not only in photography, but in water colour drawing, and in fact in anything which may be either an amusement to some or a source of profit to others. I once, I assure you, had a friend bring me, beside himself, his wife, and three children, of the respective ages of 6, 4, and 2 years, to have their portraits taken, without asking me if *I would* take them, and specifying, as regards the children, that they should be taken like the *Sleeping Child*, which I shall have the pleasure of handing round to you this evening, and which they appeared to admire very much. I declined to make the attempt absolutely, and he departed in peace with a portrait of himself and wife only.

And this reminds me, gentlemen, that if I were to give you all my recollections of children offered and declined, I should possibly detain you here longer than you would wish. How my neighbours, even, who can see my glass house and guess at its use, and who possess (which of course it is) the prettiest little child in the world, will politely send the muslin'd and mottle-legged little thing, with a polite request that I would be kind enough to take its portrait. How also each little one is warranted to stand or sit like a lay figure; and the black looks we have to put up with from mamma, when we politely but firmly decline to make the attempt, unless her "lively beauty" be converted into a "sleeping" one, when of course there is not much difficulty in the matter: in fact, I think every fond parent desiring to possess photographs of their children should provide themselves with one of those extraordinary little instruments, with that most extraordinary name, invented by Mr. Skaife, or else patiently wait until their little ones arrive at a really "taking" age. Strangely enough, too, it happens that photographers who have children of their own very seldom indeed have photographs of them: no one likes the work, and it is put off from day to day with the usual result of such a proceeding.

The absolute hard work amateurs do, and call it amusement, is really wonderful. Not for them is the handy youth to clean glasses, clear up the room, filter baths, wash bottles, or do the numberless little offices connected with photography—not for them is an assistant to sensitise paper, print, tone, fix, and wash—no, the whole work falls single-handed on the poor amateur, who simply consents to do all of it, and bear the expense of it too, for his love of the art; and all he asks in return is some reasonableness and consideration at the hands of his friends, and some encouragement for his efforts. To an amateur the most tedious part of photography is the printing and toning; and I firmly believe that visitors generally imagine that having obtained "the glass," as they call it, there is nothing more to be done. I have, however, lately found the printing so tedious, that I have given the negatives to their several owners, who have them printed by a professional printer—of course very much better than I could do them myself for them.

Next to the satisfaction usually given by us amateurs to our sitters—I don't think we have much to complain of on that account; I find most of mine, at least, easily pleased—but the part that frequently surprises me is this. It happens with me, as also with several friends of mine, that, having taken one negative, there is some *very* slight defect in it which induces me to take a second, which, may be, turns out infinitely superior as an artistic picture. The two negatives are printed, and a proof of each submitted for selection: almost invariably the better one is rejected. Whether it is, as your Secretary may inform you, that the second picture is too sharp, or from an absolute incapability of appreciating that which is better, I must leave to wiser heads than mine to determine. Recently, a professional photographer, with whom I am intimately acquainted, showed me some card pictures, with which he acknowledged he was very much dissatisfied. They were certainly not up to the standard of his productions. After hesitating for some little time, he finally sent them home, expecting of course to hear complaints of them; but, much to his surprise, he received in a day or two a very good order for impressions from the same negatives.

Usually people admire the *best* and *most artistic* portraits of *their friends;* but, strange to say, are not so critical with portraits of *themselves*—in fact, they sometimes, like Narcissus, fall in love with their own reflection, and, with the usual blindness of that condition, fail to see most patent defects in the picture.

Some short time since I was spending an evening with a friend, and photography forming the subject of conversation, a gentleman present said "he certainly admired photography, but out of the great number of portraits he had seen, he had rarely met with one representing the face with a pleasing expression: some appeared staring, others in pain, and but very few absolutely truthful;" and in furtherance of this (although to my mind a perfect refutation) he pointed out some really beautiful productions on the walls of the room.

One portrait, however, he admitted to have seen, nay to possess, which comprised all that *he* wished, which was indeed all a photographic portrait should be, viz., truthful to nature, pleasing in expression, and graceful and easy in pose: in fact, he said he happened to have it in his pocket. I naturally asked permission to see so great a gem, to admire and imitate, to beg, borrow, or steal

it, so that I might call it mine, and thus have for my model this wonderful type of all that was perfect. He consented, and as in the schoolboy tale of the "chameleon," he produced the card, and lo! it was himself, badly taken, and as badly printed; and, as to truthfulness of expression, the man had hair of that colour which cannot be represented by photography, and carried on his face a most decided smirk. I could not restrain a smile, and coldly telling him I did not think much of it, he replaced it in his pocket, and did not speak to me again the remainder of the evening. Fortunately photography stands in no need of begging admiration: it has grown from a very small seed, is growing, and will, I feel sure, continue to do so while the world lasts, more especially while it receives the august patronage it has hitherto secured.

Gentlemen, I submit for your inspection a few photographs, the best that I can do. Be merciful while you strike. Remember, if you please, that I am only an amateur, compelled to work at odd times, and those frequently at some distance apart. The main object I had, however, in bringing them this evening was to show you the results produced by my old faithful friend pyro., as a developer. It is said that this is the "iron" age, and that, I suppose, has something indirectly to do with the use of that metal as a reducing agent; but, irrespective of the double process necessary in its use, I have always found that I could do everything I desired with pyrogallic acid. The whole of the portraits now before you were taken in a glass-room, with the sitter facing due south, the slides being totally opaque, and the front admitting scarcely any light at all; and, without wishing to "bore" you, I will shortly tell you my mode of taking them. The lenses are Ross's, the bath 40 grs. to 1 oz., without any addition whatever. The collodion, Ponting's negative, and the developer 1½ grs. pyro. to the oz.; the smallest quantity of glacial acetic acid, with which to ensure a clean picture, and a little alcohol to make it flow easily. Fix by pouring saturated solution of hypo. on the plate, not by immersion. From this I seldom vary, save for experiment; and as I never intensify by adding silver to the developer, but produce my negatives by one (albeit prolonged) development, I do not think I shall resort to other means. Results surpassingly beautiful have been, and are, produced with iron, but the tendency with many manipulators is to produce hard negatives with violent contrasts. I find my way simple, and to me tolerably certain; and, although it may be old-fashioned, it answers my purpose in all that I wish. Too much light I find a decided objection with pyrogallic acid; and it is a matter of surprise with gentlemen who have visited me to find all my light received through the top only, and even that for the most part through stippled glass. I like to see the light fall on the sitter, so as to give a gloss to the hair: it looks to me natural and familiar, for in these days of Maccassar and pomades it is always visible, either by day or artificial light. I suppose, however, it is simply a question of taste, or, perhaps, with me, a very "questionable" taste. Although the aspect of my room is certainly not the best, on account of the sun, I am almost of opinion that it produces greater roundness of feature than any other, and should certainly choose the same aspect on building another.

Before I conclude I should like to draw the attention of photographers to the great advantage of the automatic washing system. Many friends who have seen my arrangement have immediately constructed one with success, and have found on testing that, with the occasional use of a sponge, the prints have been perfectly washed. The contrivance is very simple, and may be made by any gentleman at the expense of a few shillings: it will last for years, and is not at all likely to get out of order. I have a diagram here which will perhaps explain to you its construction. It is simply, as you will observe, an oval wooden tub with an orifice made some two inches from the top. Through this is inserted a leaden pipe of about ¾-inch bore, which is then brought to the bottom of the tub through a false and perforated bottom of zinc. The portion of the pipe immediately in connexion with the outside of the orifice is then bent into two elbows, taking care that the second is slightly below the first: it is then continued any length you please. Immediately the water rises above the first and higher elbow the syphon begins to work, and rapidly empties the tub from the bottom. The false bottom is only to prevent the prints being sucked up the pipe. I am aware there is nothing new in this; but it may have escaped the notice of many gentlemen, and I wish to bear my testimony to its advantages, as all that is necessary is to place it below the tap of a cistern, in such a manner that the influx may give a rotatory motion to the prints, with the projecting limb over a drain, and regulate the supply so that it shall empty itself, say three times in the hour.

One word with respect to varnish, about which we have lately read so much. I have for a very long time used varnish prepared after a receipt of a very practical friend of mine. I can vouch for its usefulness, cheapness, and capability of standing any amount of sun-heat. Obtain from any colourman some best white hard carriage varnish, and dilute the same down with methylated alcohol. Warmth is necessary for its application, and the right proportions are soon ascertained after a few trials. Should it become cloudy on adding the alcohol, in a few days it will become absolutely limpid and may then be decanted—immediate filtration, however, having the same effect. Gentlemen, I thank you for your attention.

ON THE STEREOSCOPIC PICTURES EXECUTED IN THE SIXTEENTH CENTURY BY JACOPO CHIMENTI.*

By Sir David Brewster, K.H., F.R.S.

In 1859, when Dr. John Brown and his brother, Dr. A. Crum Brown, were visiting the Museum of Wicar, at Lille, their attention was called to two pictures of a man sitting upon a low stool, and holding in his left hand a pair of compasses and in his right hand a line reaching the ground. These two pictures appeared to be exactly the same as if the one had been copied from the other. They were each about *twelve* inches high and *eight and a-half* broad, and were placed close to one another like the pictures in a stereoscopic slide. Dr. A. Crum Brown, on his return to England, sent me the following account of these two pictures which, I think, was read in his presence at a former meeting of this Society:—"These two drawings," he says, "are by Jacopo Chimenti da Empoli, a painter of the Florentine school, who was born in 1554, and who died in 1640. They are drawings of the same person from points of view slightly different. That on the right hand is from a point of view slightly to the left of that on the left hand. They are so exactly on the same scale that by converging the optic axes I succeeded in uniting the two so as to produce an image in relief. They united so easily and completely that I could not help thinking that they had been drawn for the purpose of being looked at in that way. So far as I could judge, the difference between the pictures was greater than would be produced by a change of the position of a spectator, equal to the distance between the two eyes, so that the stereoscopic effect was somewhat exaggerated. I think if we had a photograph of the pictures it would be much easier to prove their stereoscopic character than by merely referring to them; and, if the photographs were of such a size that they could be *transposed* and put in the stereoscope, any one could see it."

I had no sooner received this very interesting communication from Dr. Crum Brown than I took measures for obtaining a photograph of this stereoscopic picture.

[Sir David here detailed the steps which he had taken to procure these photographs, in the prosecution of which several difficulties presented themselves. Having alluded to some correspondence which passed between him and Sir Charles Phipps, he continued.]

When I received this letter I was writing the article "Stereoscope" for the *Encyclopædia Britannica* and I inserted in it the remarkable discovery made by Dr. Crum Brown. I had previously shown in my *Treatise on the Stereoscope* that Galen had, fifteen hundred years ago, proved that in looking at solid bodies the pictures given by each eye were dissimilar, and that with both eyes he saw these two pictures combined.

In illustrating these views of Galen, Baptista Porta gives a figure in which we not only see the principle of the stereoscope, but a representation of the binocular slide by three circles, two of them indicating the right and left eye pictures and the middle one the other two, united by the eyes, and producing the figure in relief which we actually see.

The work of Baptista Porta containing this diagram was published in 1593, and Jacopo Chimenti lived 47 years after its publication. It was therefore probable, as I stated, that in executing the stereoscopic picture Chimenti was illustrating the binocular diagrams of the Neapolitan philosopher, and was the true inventor of the ocular stereoscope—that is, of the method of obtaining a solid representation of any object by uniting right and left eye pictures of it by converging the optic axes to a point nearer the observer than the pictures.

This opinion was founded on the supposition that Chimenti's two figures were truly stereoscopic; and, as I know that Dr. Crum Brown was thoroughly acquainted with the subject of binocular vision and the theory of the stereoscope, I had no doubt that he had seen a figure in perfect relief by uniting the two plane pictures of it.

* Read at a Meeting of the Photographic Society of Scotland, March 11, 1862.

Having failed in procuring a copy of these pictures, I had no means of testing the accuracy of Dr. Brown's experiments; but it appears that in June, 1860, Mr. Wheatstone applied to Professor Kahlmann, of Lille, and obtained from him a photograph of Chimenti's drawings. In the letter which accompanied it Professor Kahlmann states "that the copy had been taken of such a size as to be suitable for examination in the stereoscope;" and he adds—"that at the first sight of it, and without the aid of any instrument, it would be seen that the two pictures were *not stereoscopic*."

The photograph thus described was accordingly placed in the stereoscope by Mr. Wheatstone and his friends in London, and they all found it not to be stereoscopic. Copies of the photograph were also sent to Paris with the same result, as will be seen from the following extract from THE BRITISH JOURNAL OF PHOTOGRAPHY for August, 1860:—

"It will, doubtless, be in the recollection of our readers that lately an intimation was thrown out by Sir David Brewster relative to the supposed antiquity of the knowledge of stereoscopic principles, the supposition arising from the fact that an artist, named Jacopo Chimenti, who lived in the sixteenth century, had executed a pair of pictures, which are at present preserved in the Museum at Lille, and which it was alleged, on being viewed in such a manner as to allow each eye to see only one of the designs, presented a stereoscopic effect. It is very unfortunate that when an announcement of any supposed fact is once made and subsequently proved to be erroneous, it is almost impossible to correct the false impression as thoroughly as is desirable; because there must always exist many persons who read the assertion but not the contradiction, while those who see the contradiction without the previous erroneous statement, can play but a very unimportant part in its rectification. Under these circumstances we conceive it to be advisable to draw special attention to a paragraph in the letter of our Paris correspondent, M. Ernest Lacan, which was published in our last number, and from which we learn that, in order to settle the question satisfactorily, our countryman, Mr. Bingham, who is a resident in Paris, took photographic copies of the alleged pair of stereographs, and laid them before the members of the French Photographic Society at the July meeting.

"When placed in the stereoscope the two pictures united perfectly, but did not present the smallest effect of relief.

"We think it is fair therefore to presume that, whatever may have been the object proposed by the artist in executing the two similar pictures, it was certainly not from any knowledge of the stereoscopic phenomenon, and that Sir David Brewster was in this instance wrong in his conjecture. It is but right to add that Sir David had not had ocular demonstration of the alleged fact when he threw out the suggestion."

The following is the letter of M. Lacan, at that time the Editor of *La Lumière*, above referred to:—

"The letter in which Sir David Brewster spoke of the two drawings of Chimenti existing in the Lille Museum, and presenting, according to the illustrious *savant*, the stereoscopic relief, has been reprinted in the *Lumière* and other special journals. We were all asking each other if the invention which so greatly honours Wheatstone and Brewster really dated from the sixteenth century?

"Mr. Bingham, who has just returned from Lille, conceived the happy idea of reproducing the two designs in question to offer them to the Society. We all examined them with care, but no one detected in them the slightest difference. They appeared to all perfectly identical. In the stereoscope they are superposed, but without any effect of relief. For the present, then, we must be permitted to doubt that they were intended for the application Sir David attributes to them."

Upon authorities so high Dr. Brown's observation of the stereoscopic effect of the pictures were pronounced incorrect; and though I was utterly ignorant of the existence of the photograph in England, excepting in the collection of the late Prince Consort, and had never either seen or heard of it, I have been charged by Mr. Wheatstone's friends with dishonesty in not having retracted the opinion which I had published—not as my own, but on the authority of Dr. Brown.

In reply to this charge I observed "that I had not only never seen the photograph in question, but had never heard directly nor indirectly any other opinion about them than that of competent judges, who found them to be stereoscopic; and I added that the evidence of Mr. Wheatstone and his friends, who were interested parties, was comparatively of little value. I still believed that the pictures were truly stereoscopic."

The paper on which this opinion was printed was hardly dry when I received, through the kindness of Professor Kahlmann, the photographs which had excited so much interest, and which I now submit to the inspection of the Society. As in all stereoscopic pictures it is difficult to perceive any difference between the right and left eye picture when they are taken at the proper angle; but when they are combined by converging the optic axes to a point between the picture and the eye, as done by Dr. Brown, their stereoscopic character is instantly seen. As very few persons, however, are able to unite the pictures in this way, I had a copy of them taken by Mr. Moffat, and the pictures transposed in order to be viewed in the stereoscope. This transposed picture is now on the table, and I have no doubt that every person who looks at it in the stereoscope will see the figure in relief, though it is more distinct when seen by the convergence of the optic axes, as Chimenti, of course, intended it to be seen. As the photograph now before us has been reduced to about one-fourth of the original, the stereoscopic relief, as observed by Dr. Brown, in the Museum at Lille, must have been more distinct than in a reduced copy taken photographically.

It is hardly necessary to observe that a stereoscopic picture executed by the hand must be very imperfect compared with those obtained by the binocular camera. The artist fixes only certain points in his copy of the original drawing, and joins these points as skilfully as he can; but, if the original be stippled or drawn only in points, and if with his compasses he places these points in his twin copy at the proper binocular distance from the same points in the original, the stereoscopic relief will be as perfect as if the two pictures had been taken in the binocular camera.

I hope to be able to show such a stereoscopic picture to the Society; and also copies of Chimenti's drawings of the same size as the original, and with all the lines, points, and shades more distinctly separated than they can possibly be in the best reduced photograph.

Some of those persons who have not seen the stereoscopic effect of Chimenti's drawings, in consequence of not knowing how to see it, have been surprised at finding two perfectly similar drawings—as they believed them to be—placed side by side; and have been led to conjecture that one of them may have been a copy by a pupil of the Florentine artist. Both the figures, however, bear the name of Chimenti; and, as we have seen, the one is as esentially different from the other as the binocular views of a solid statue.

SUPPLEMENTARY PHOTOGRAPHIC EXHIBITION.*

Letter from M. Claudet to the Secretary of the London Photographic Society, on the question of a separate Exhibition of Photography as an Annex to the International Exhibition of 1862.

TO THE SECRETARY OF THE LONDON PHOTOGRAPHIC SOCIETY.

107, *Regent Street, February* 20, 1862.

DEAR SIR,—There seems to exist a strong feeling among photographers that there should be this year, as usual, a special Exhibition of Photography upon a scale sufficient for showing the state of the art, and adequate to its present magnitude and importance.

Although I fully recognise the necessity and advantage of such an Exhibition, I would be sorry if it were undertaken without the concurrence of the parent Photographic Society. I do not say that if a respectable and competent committee were formed to carry out the plan, independent of that Society, I would decidedly refuse to contribute to the Exhibition; but I consider that, for the success of the Exhibition and for the dignity of photography, it would be regretted if it were established under any other direction than the one which has for several years so successfully presided over the Annual Exhibition of London.

There can be no question that if a separate Photographic Exhibition offer any chance of success, it must be under the influence and management of the London Photographic Society; and I do not see what reasons there could be for its wishing to abstain from giving its support to the undertaking, when the general desire of photographers is for their usual Exhibition, considering that they cannot find in the International Exhibition of 1862 sufficient room for showing the various styles and characters of the present state of photography.

Therefore I should be glad if you would submit to the next meeting of the Council the reasons which make me believe that such a separate Exhibition is desirable for the advantage of photography—that it can be established in no spirit of opposition to the International Exhibition, and without appearing in the least to find fault with the arrangements of her Majesty's Commissioners respecting the space allotted to photographic productions.

When we consider that a single building, however great it may be, is to contain the works of art, science, industry, and manufactures of all the world, it could never have been expected that all applicants should have been admitted, and that there should have been space enough for holding all their productions. It is indeed to be wondered how the Royal Commissioners have been able to grant 3000 square feet for the display of photographic pictures. Supposing that the vertical space for hanging photographs should be 5 feet (and it can hardly be so much for a convenient sight), that gives a length of 600 feet, or about $\frac{1}{8}$th of a mile of wall in the building. Such a space certainly is as much as could ever have been devoted to a single branch of productions. Therefore it would be unjust to complain, and unreasonable to ask more for photography alone. There is no remedy on that score.

But if, owing to the great number of photographers who are to exhibit, every one has a space in which he cannot display his specimens of every kind of photographs, how can he show his

* Read at a Meeting of the Photographic Society, 4th March, 1862.

capabilities? One of the new features of photography is the enlargement of small photographs by means of the solar camera. Now suppose that a photographer would have to exhibit only two portraits as large as nature, in suitable frames, one of a lady and one of a gentleman, these two portraits would occupy the entire space allotted to the most favoured.

Foreign photographers, working in a more favourable climate, where they can operate nearly every week all the year round with the sun, will be able to exhibit those kinds of enlarged pictures, portraits, or landscapes; and if with immense difficulty, under our cloudy sky, we have been able in England to produce such photographs, we shall be prevented by want of space from exhibiting them at all.

Besides, every photographer who exhibits painted portraits must also exhibit copies of the black photographs which have served to the painters, in order to show the accuracy of the likeness. How can he display the number of pictures exemplifying the various styles of the art? Must he not show how he can treat every subject of portraiture—groups, old and young of both sexes, children, white and dark dresses, uniforms; in fine, all that is constituting the difficulties of photography? The fact is that photography for the whole United Kingdom cannot be fairly represented at the International Exhibition in 3000 square feet: it cannot but be incomplete and unsatisfactory.

I consider that it is the duty of the Photographic Society of London to protect the interests of the art it represents, and to endeavour to prove to the world who is invited to London that photography in this country has had its share in the wonderful progress made since the Great Exhibition of 1851; that notwithstanding the absurdities of ignorant and prejudiced writers, the jealousy of incapable *soi-disant* artists, it has attained the highest perfection, and deserves to be ranked among the fine arts.

The opportunity should not be lost. Let it not be said that those who come to London from all the centres of civilisation and knowledge, in order to witness the progress of arts, sciences, and manufactures—the wonderful feats of an era of peace and reason—had no other means of judging of the state of photography in England than to see in some parts of the building of the Great Exhibition, not an exhibition of photography, but only, as it were, a catalogue of all those who have worked in the hope of being able to exhibit their productions.

When it is known that, besides the few specimens of every photographer admitted at the palace of the International Exhibition, there is somewhere in London a special and complete Exhibition of Photography, there is no doubt that all those who take an interest in the progress of the art will come and visit this Exhibition. There nothing will distract their attention, and they will be able to devote all their mind to study and examine the works of photography, guided by a catalogue full of all the particulars required, and aided by any explanations they may require from competent officers appointed for that purpose.

The Photographic Exhibition should be in London; and it is supposed that a proper and convenient building may be found in some central part of the town, capable of holding all the numerous and varied works which will be proposed for the Exhibition of Photography.

A very simple scheme to secure the success of the undertaking in a financial point of view would be an entrance fee of 2s. 6d., 1s., to 6d., for specified days and evenings, added to a moderate rent charged to every exhibitor in proportion to the space occupied. This would, it may be well supposed, not only cover the expenditure, but leave a surplus at the credit of the account.

Before engaging the building and organising the Exhibition, it would be necessary to open a list of guarantors for the success of the Exhibition, in order that the Photographic Society should in no case be exposed to suffer from any excess of expenditure over the receipts. Nothing should be done before having ascertained, by another list, the space demanded by every exhibitor, and having received his engagement to fill up the space occupied, and pay the amount according to the price fixed.

I propose that the Council of the Society will allow that the question of a separate Exhibition under its superintendence should be discussed at the next meeting; and I hope that the reasons I have given for its propriety, and showing its advantages, will induce the Council to have the plan carried out.

The immense concourse of visitors who will be attracted to London during the time of the International Exhibition of 1862, as was the case at the time of the Great Exhibition of 1851, will flock to all the minor exhibitions, so that it cannot be doubted that a well managed and complete Exhibition of Photography will prove to be an excellent commercial speculation, and afford to the Photographic Society the occasion of increasing the fund which is so essential for the protection and welfare of the art of photography in England.

I am, dear Sir, yours very truly,

February 21st, 1862. A. CLAUDET.

P. S.—I see, in this day's number of the *Photographic News*, that the South London Photographic Society is proposing a Photographic Exhibition at the Crystal Palace at Sydenham. Certainly such an Exhibition would be better than no Exhibition at all, and the proof of it is that for several years there has been an Exhibition of Photography there, and that, besides this gratuitous display, several professional photographers think it their interest to pay very high rents to exhibit their specimens in various courts of the Crystal Palace in order to get customers among its numerous pleasure-seekers. But I am convinced that the Crystal Palace is not the proper place for a serious Exhibition of Photography. We want an exclusive Exhibition in London, under our own management, where people will go for no other purpose than to examine the productions of photography, to judge of its progress, study both its scientific and artistic characters, and compare the various styles of the art. This cannot be done in the midst of singing, concerts, and all the frivolous gaieties of the Crystal Palace.

CELESTIAL PHOTOGRAPHY.

Presentation of the Gold Medal to Mr. Warren De la Rue, F.R.S., &c., by the President of the Royal Astronomical Society.

THE following interesting and eloquent address was delivered by Dr. LEE, President of the Royal Astronomical Society, on the 14th ult., on the occasion of the presentation of the Gold Medal awarded to Mr. De la Rue, chiefly in consideration of his eminent services to astronomical science in perfecting the use of photography as a means of automatically recording certain celestial phenomena:—

GENTLEMEN,—In the Report which has been read to you, you have been informed that the Council have assigned the gold medal of the Society to our worthy Secretary, Mr. Warren De la Rue, and, as is the custom, it is now my duty to explain to you in a few words the grounds of their decision.

You all know that for many years Mr. De la Rue has devoted the energies of his mind, a large expenditure, and such leisure as he could abstract from the complicated cares of an extensive and well-known commercial concern, to the earnest cultivation and systematic pursuit of practical astronomy, and that he has been one of the most frequent contributors to our evening meetings upon a variety of subjects, all requiring much knowledge, skill, and labour in their treatment.

Discoveries in the regions of science so crowd upon us in our own times that valuable inventions and striking results soon fade from the memory, and are lost in the brilliancy of those that rapidly succeed them.

I must therefore request your indulgence whilst I lay before you what it is that Mr. De la Rue has done to entitle him to receive, and the Council to award, the highest honour which it is in the power of the Royal Astronomical Society to bestow.

Mr. De la Rue has not only conducted the usual observations which are made at most private observatories, but he has directed the resources of a rare mechanical genius to improvements in the most approved methods of polishing the speculæ of reflecting telescopes, and perfecting the mechanical arrangements by which operations of such refined nicety are performed.

On this subject there can be no higher authority than Sir John Herschel, who, in an article *On the Telescope*, published in the *Encyclopædia Brittannica*, says:—"Such is Mr. De la Rue's mechanism, which has afforded very admirable results in the production of specula thirteen inches in aperture and ten feet focal length, the perfection of which is enhanced by his practice of bestowing the same care and precision on every step of the figuring of the speculum from the grinding, the smoothing on a bed of hones—or rather a slab of slate cut into squares carefully brought to the same figure—and to the figuring of the polisher itself, which being thus previously rendered almost perfect, the speculum is saved the rough work of having to figure the polisher for itself on every occasion of repolishing."

But it is in celestial photography that Mr. De la Rue has made his most important discoveries, and displayed an unfailing fertility of mechanical invention.

Wisely acknowledging the growing vastness of the several departments even of the same science, he has latterly, in a great measure, restricted his researches to the delineation of the various aspects of the heavenly bodies through the medium of photography.

It is only by acknowledging and adopting the principle of the division of labour that great results can be obtained, either in the pursuits of commercial industry or abstract science. The days of the admirable Crichton have long since passed away. Indeed, Lord Bacon himself, in the *Novum Organum*, well observes, in anticipation of the influence of

this general principle:—"Then men shall begin to find out their own powers when all will not essay to do the same things, but each man will employ himself in the work for which he is most apt."

Mr. De la Rue's claim to the special notice of astronomers, as a delineator of celestial objects through the medium of photography, does not rest on the absolute priority of his application of a well-known art in a new direction. It is rather based on the fact that by methods and adaptations peculiarly his own he has been the first to obtain automatic pictures of the sun and moon sufficiently delicate in their detail to advance our knowledge regarding the physical characters of those bodies, and admitting of measurements astronomically precise.

Admiral Smyth informs me that the late Mr. Bond, of Cambridge, in the United States, in the year 1845, with the assistance of Messrs. Whipple and Bond, obtained good pictures of Lyra and of Castor, and that in this year Signor De Vico made an unsuccessful attempt to photograph the nebulæ in Orion.

Mr. Glaisher, writing in 1851, as reporter upon Philosophical Instruments in the Great Exhibition, Class X., and upon Mr. Bond's daguerreotype of the moon, taken in 1850, and which was placed in the Exhibition of 1851, says upon photography:—"Let us now view photography in its application to science—a process by which transient actions are rendered permanent, and which enables Nature to do her own work, or, in other words, which causes facts permanently to record themselves—is too well fitted for the purpose of science to be long overlooked; but the difficulties to be overcome in its application have been and still are great, and the results proportionably few in number. We consider, however, that the commencement of a systematic application of the photographic process to the purposes of astronomy is indicated by the daguerreotype of the moon, by Mr. Whipple; and great, indeed, will be the benefit conferred upon astronomical science when we obtain permanent representations of the celestial bodies and their relative positions, through the agency of light."

Enlarged copies of Mr. Bond's photographs were laid before the Royal Astronomical Society in May of the same year. At the meeting of the British Association of Science held at Ipswich, in July, 1851, under the Presidency of the learned Astronomer Royal, a daguerreotype of the moon was shown to the members of the mathematical section by Mr. Bond, assisted by Mr. Whipple, from the image formed in the focus of the great equatorial of the Cambridge United States Observatory; and his Royal Highness the Prince Consort, whose loss we now so deeply deplore, was present on the occasion and inspected the daguerreotype.

On the subject of the connexion of photography and chemistry with astronomy some interesting remarks appear in the admirable lecture on the sun, delivered by the respected Professor Walker before the British Association for the Promotion of Science, under the Presidency of our esteemed member, my Lord Wrottesley, in 1860, at Oxford.

There are several references to celestial photography in the various volumes of the *Comptes Rendus* which can only be brought to your notice in the form of notes.

Respecting this photograph of the sun, the index of the *Comptes Rendus* has been searched all through under the heads of "Arago," "Photography," "Soleil," "Fizeau," "Foucault," "Daguerreotype," and "Faye," and no mention has been found whatever of the sun picture in 1845, and there has not been found any reference to it excepting the plate in the body of the original work itself.

It was the sight of these very promising photographs of Mr. Bond's which first gave the impulse to Mr. De la Rue's labours in this direction. In 1852 he availed himself of the collodion process invented by Mr. Archer in the preceding year, and succeeded in obtaining a good picture of the moon. In 1853 Professor Phillips obtained Talbotypes of the moon at York. In 1854 lunar photographs were secured at Liverpool under the supervision of Mr. Hartnup. In 1855 the Rev. J. B. Reade, who has distinguished himself in photography, obtained special notice and honourable mention at the Paris Exhibition for his photographs of the moon. Others, also, have been taken at Rome by Signor Padré Secchi; at Brighton by Mr. Fry; and in the vicinity of London by Mr. Huggins. All these photographs possess merits of their own, and give decided promise of future and greater success.

Admiral Smyth, in the *Speculum Hartwellianum*, pp. 249-50 and 285, speaks of Mr. Bond's labour in celestial photography, particularly pointing out that, in 1857, a photograph was sent to the Astronomer Royal taking in the whole field between Mirza and Alcor, with such exactitude as to show their angles of position and distances.

Mr. De la Rue's success in obtaining photographic pictures of the moon, possessing great sharpness of definition and accuracy of detail, is owing to the happy combination of a variety of causes. Possessing a large mirror of such exquisite defining power that but few existing telescopes equal it in accuracy of definition, and brought into figure by his own hands, and by peculiar machinery of his own contrivance, he was at once freed from those imperfections in the actinic image which are of necessity inherent in the very best refractors, corrected the most accurately for chromatic dispersion.

Mr. De la Rue at first had no clock-work apparatus to govern the motion of his telescope, and he discontinued his selenographical experiments until he had removed from Canonbury to Cranford—a change of residence which, for the interests of astronomy, he had for some time previously in contemplation. He then furnished his telescope—his own in a double sense—with a clock-work apparatus, which, from time to time, has passed through numerous alterations, and is still in course of improvement. The mechanical problem before him, as the Fellows of this Society well know, was one of extreme complexity; for not only must the motion of the clock-work be perfectly smooth and equable, but it must also be capable of acceleration and retardation to keep pace, so to speak, with the ever-varying velocity of the moon in the heavens—a variation compounded of its diurnal motion and its ever-changing velocity in its orbit.

Lastly, by a rare and happy combination of chemical with mechanical skill, the time necessary for the exposure of the collodion film was materially shortened. The final result is this:—That images of the moon have been repeatedly taken in the focus of the mirror, admitting very considerable amplification, and exhibiting details on the moon's surface sufficiently clear to admit of delineation under a microscope provided with a camera lucida, and thereby furnishing materials for more accurate selenography than has heretofore existed.

Neither must we altogether omit that, by stereoscopically combining images of the moon taken in different phases of her librations, Mr. De la Rue has brought to light details of dykes and terraces and furrows and undulations on the lunar surface of which no certain knowledge had previously existed, and which I have had the pleasure of seeing in his observatory at Cranford.

I must now turn to a department in celestial photography where Mr. De la Rue stands almost alone. I speak of heliography. In April, 1854, Sir John Herschel, in a letter to Colonel Sabine, recommended that daily photographic records of the sun should be obtained at some observatory. Accordingly, the Royal Society placed at the disposal of the Kew Committee a sum of money to promote that object, and Mr. De la Rue was requested to administer the grant.

It becomes necessary to mention that Arago, in his elegant and popular work on astronomy, translated by two eminent Fellows of our Society, states that MM. Fizeau and Foucault, in 1845, obtained a photographic image of the sun and two spots on its disc, delineated with much apparent sharpness and accuracy; but, however this may be, it is certain that no uniformly successful method of taking images of the sun had been devised until Mr. De la Rue took up the problem for investigation. But, great as had been the difficulties in obtaining a really accurate and available picture of the moon, they sink into insignificance when compared with those which had to be overcome in the photography of the sun.

To obtain any automatic picture of the sun's photosphere available for practical purposes, it was found necessary to institute a series of preliminary experiments before actual operations could be successfully commenced. At first, nothing but burnt-up and solarised pictures could be obtained by any method that had hitherto been devised, or with any the least sensitive of the media that could be procured. Now, with the help of the Kew photoheliograph, as devised by him, and described in volume XV. of the monthly notices, heliography is the easiest and simplest kind of astronomical photography. The method devised by Mr. De la Rue will enable any photographer, of common average skill to take excellent heliographs. Professor Selwyn, of Ely, succeeds in getting pictures of the sun with the apparatus made for him by Mr. Dallmeyer, after the pattern of the Kew photoheliograph.

Mr. De la Rue announced, at the last meeting of the Society, that by applying the stereoscope to the examination of the sun's disc—as he had formerly done in the case of the moon—he had discovered that the faculæ on the surface of the sun are to be found in the outer or highest regions of the solar photosphere.

I ought not to conclude without alluding to Mr. De la Rue's observations on the solar eclipse of 1860. But it must not be forgotten that one daguerreotype picture was taken by Dr. Busch of the solar eclipse in 1851; and of the solar eclipse in 1860 four small pictures were taken during the totality by Professor Monserrat, under the direction of MM. Aguilar and Secchi, at Desierto de las Palmas, in Spain.

Mr. De la Rue, during the progress of the same eclipse, took many large and exquisitely-defined pictures, and secured two during the totality. I have no need to enter into details, as he has already described at several meetings of this Society the numerical results that follow from the discussion, and the comparisons of the photographs which he took on that occasion.

Mr. De la Rue has invented an ingenious micrometer, and which he has lately exhibited at one of our meetings, by means of which he fully confirms the hypothesis that the coloured protuberances belong to the sun, and render it almost certain that the commonly-received diameters both of the sun and moon require a correction.

More recently still photographic pictures of the sun have been obtained, not only exhibiting its well-known mottled appearance, but showing traces of Mr. Nasmyth's "willow leaves," and, by the aid of the stereoscopic pictures, rendering it certain that the faculæ are elevations in the sun's photosphere.

I need not enlarge on the wonderful discoveries which have been made, and the astonishing results that have been obtained, by Newton and his successors in this the most fertile and exact of all the applied mathematical sciences, neither would it become me, an humble but zealous worshipper of science, to hazard conjectures as to the future progress of astronomy; but I may, perhaps, be permitted to remark, that while our great national and public observatories—indeed I ought to say those of the civilised world as well—are day by day adding to that enduring

record of the transient phenomena of the heavens which will enable future ages to reach the final finish and last perfection in the calculation of the tables of the motions of the moon and the planets—to eliminate any element of error, however minute—and to detect any latent perturbing force, however feeble its effect—yet it is to private observatories, and to observations made in the remoter regions of starry space, that we are chiefly led to look for new discoveries. It augurs well for the future that there is no lack in our own day of such establishments, or of accomplished observers to use them. It is almost, if not altogether, needless to bring before you the names of Sir James South, Admiral Smyth, Lord Rosse, Mr. Lassell, Lord Wrottesley, Mr. Davies, Mr. Carrington, and a host of others familiar to many of you. The elliptic motions of binary stars round their common centre of gravity, the colours of others, the discovery of new planets, the calculation of cometary orbits, the laws of change in the variable stars, the sudden burst upon the sight of some stars and the gradual evanescence of others, will afford for many generations suitable and exhaustless subjects of sustained astronomical research. The instant splendour and gradual decay of certain stars is one of the most wonderful facts recorded in the history of astronomy. It was Hipparchus who first, I believe, noticed the sudden appearance of a star of singular brilliancy before unknown. By this strange discovery he was urged to construct a catalogue of stars visible to the naked eye, "that posterity might know whether time had altered the face of the heavens." In 1572, Cornelius Gemma observed a star, in the chair of Cassiopea, transcending Venus herself in brightness.

The art of photography is of the very highest importance in the promotion of exact science. It stereotypes, so to speak, for the use of all time to come, the present aspect of the heavens.

As astronomical observations ranged in tables record the present positions of the heavenly bodies, so photography registers their present aspect. It may be that the pictures of the sun now taken will enable future ages to test the prediction of the poet—

> "The stars shall fade away,
> The Sun himself grow dim with age,
> And Nature sink in years."

I trust that I am not guilty of a breach of confidence if I mention (though I am not authorised to do so) that Mr. Babbage, who was one of the original members of this Society in 1820, and one of its first Secretaries, has informed me that, although he feels that he has not sufficient acquaintance with photography, as well as with other subjects, to enable him to do justice to Mr. De la Rue, still, in his opinion, the additions made by Mr. De la Rue to science are fully worthy of any acknowledgment which a medal may indicate.

I cannot resist taking the same liberty with the opinion of Sir James South—who also was one of the original members of the Society in 1820, and a member of the first Council and President in 1829 and 1830, and the founder of the noble Kensington Observatory, which will for ever immortalise his name—who says that, "in his opinion, the decision of the Council of the Society in decreeing its medal to Mr. De la Rue meets with his approbation, and he heartily approves of the decision."

I am permitted by the Lord Chief Baron, Sir Frederick Pollock, the President of the Photographic Society, and who has been for many years one of our esteemed members, to mention that he maintains a great respect for the labours of our medallist and of their results, and a high opinion of him as a man who is singularly devoted to science.

An old and invaluable friend remarks—in writing on the merit of Mr. De la Rue—that "he has turned the eye of photography upon the sun, and has brought away results which no other eye could see. When by smoked glasses, dark glasses, or reflection from water, you diminish the light of the sun, you proportionally diminish all other light, and the red horns—the protuberances—cannot be seen; but when there is a total eclipse of the sun, its light is stopped, and the mountains in the sun become visible. Mr. De la Rue has availed himself of ingenious contrivances to overcome difficulties."

I am permitted by Sir John Herschel—who became one of the original members of the Society on the 12th January, 1820, and was one of the three first Secretaries under the Presidency of his illustrious father, and himself President in 1827—to mention that Mr. De la Rue has deserved exceedingly well the medal of the Astronomical Society by his admirable execution of those large and highly-finished specula which he has wrought and polished by machinery, invented and constructed by himself; and which, though grounded on Mr. Lassell's rotatory principle, is by no means a servile imitation of Mr. Lassell, inasmuch as several distinct improvements have been introduced, tending to distribute the polishing action more equally over the whole surface of the metal. One of these improvements consists in his interposition of a plate between the supporting plate and sliding plate of Mr. Lassell's traversing slide, which being made to revolve causes the traversing movement of the speculum to take place—not across the same diameter of its area, but at every stroke across a different diameter; and he also obviates the irregularity of the motion of Mr. Lassell's polisher on its centre by governing that rotation by mechanism, instead of leaving it to be determined by the excess of external over internal friction. Both seem to me to be very judicious and real improvements.

Of course I need not to you record Mr. De la Rue's merits as an artist, manifested in his beautiful representations of Saturn, Jupiter, and Mars; nor as a photographer, in attacking with so much perseverance, skill, and excellent success, the difficult problem of solar photography, which he has carried out on a very large scale in projecting spots on a disc a yard in diameter.

Mr. De la Rue's photographic depictions of the red protuberances at the eclipse in Spain, I suppose, are considered decisive as to their belonging to the sun. And his photographs also show other evidence of very extensive atmospheric luminosities, which greatly enlarge our ideas of the material extent of the sun's atmosphere. He has also obtained stereographs of the faculæ, and verified Nasmyth's "willow leaves," &c., &c.; and a paper giving the result of his labours during the eclipse expedition to Riva Bellosa has been presented to the Royal Society, and is to be considered in March of this year.

The Rev. Charles Pritchard has communicated his enlightened idea of the splendid discoveries which may soon be revealed to us. He informs me that Mr. De la Rue has made that certain which before him amounted to no more than a hope, by showing that pictures of the sun and moon could be taken possessing accurate and delicate and measurable detail. He has shown that there is now the strongest ground for hope that, by the aid of photography and the stereoscope, the "*rose-coloured prominences*" above the photosphere will be ultimately and at all times made visible as existences above the other portion of the solar atmosphere, just as the faculæ have been made prominent already.

The depth of the sun's spots may also be hoped now to be brought into tangible view.

The different planes of Saturn's rings will also come into relief, and we may soon hope to know, by the same stereoscopic aid, whether the belts of Jupiter are or are not portions of his dark body, or clouds in his atmosphere above.

We may hope, also, ere long to see the mountains and elevated continents of Mars rise up into solidity before our delighted gaze.

If, then, we take collective note of all Mr. De la Rue's long and varied labours since the 14th March, 1851, when he became one of our members—such as the perfecting of the figures of mirrors, the graphic observations of the planets, the incomparable photographs of the moon, the invention of the photoheliograph, the observations on the solar eclipse, the invention of the new method of obtaining numerical data, the application of the stereoscope to the examination of the surface of the moon and afterwards to that of the sun—sure am I that the Society at large will unanimously approve of the award of their medal made by the Council.

It may, however, be said by some ingenious critic that photography is only an art which bears but indirectly on the promotion of astronomy, and that the reward of its successful manipulation is rather the province of those Societies to confer which cultivate the art of photography or the science of chemistry. But I cannot allow of the justice of this view.

What should we now say of the early Fellows of the Royal Society if they had delegated Newton, when he invented the telescope that bears his name, to the Company of Spectacle Makers for his meed of praise?

What should we now think had the barren honours which grace scientific discovery been denied to such mechanical inventors as Hadley, or Dolland, or Sir William Herschel, or Lord Rosse, or Lassell? With them the name of De la Rue, I feel, will hold no inferior place.

Mr. De la Rue, in compliance with a resolution of the Council, I have the pleasing duty of placing in your hands the highest tribute to merit which they have it in their power to bestow. The instruments made or improved by you—the important uses to which you have applied them—and the liberality with which you have communicated the results of your discoveries to the public—all indicate, in the opinion of the Council, a mind highly cultivated, the energy of which has been directed during many years to the attainment of scientific perfection.

But the immediate cause of their approbation is your unceasing efforts and delicate manipulation in reducing the new and wonderful art of photography to astronomical purposes, and in rendering chemistry an assistant to astronomy.

May Divine Providence, "the high and lofty One, that inhabiteth eternity, whose name is holy"—may "the Great First Cause least understood" bestow upon you health and intelligence, and every social blessing, in order that you may be enabled by your thoughts and words and actions to continue to augment His honour and glory, and the benefit and the happiness of all our fellow-creatures; but, as I am in private duty bound to pray, the more especially for the benefit and happiness of your brothers—the members of the Royal Astronomical Society.

PRIZE FOR AN INSTANTANEOUS DRY COLLODION.

At a meeting of the Marseilles Photographic Society, held on the 28th ult., the following programme was issued for the guidance of those who desired to compete for the Society's prize for the invention of an instantaneous dry process:—

Programme of a Competition Open to all Nations for a Prize of 500 Francs for the Invention of an Instantaneous Dry Collodion.

One of the subjects which at present commands considerable attention in the photographic world is that of a dry collodion process, possessing, in addition to certainty in the results, the equally important condition of rapidity.

Hitherto results have been obtained which afford the highest satisfaction, and which encourage the hope that a brilliant future is open to this

new art—a future prolific in resources, and yielding still greater triumphs than have been already attained.

Up to this time one of the indispensable conditions of rapidity, or *instantaneity*, has been the adoption of a *wet* collodion process. How much greater would be the degree of perfection if results of a similar nature and excellence were obtainable by a *dry* collodion process!

Desirous of contributing as much as possible within the limits of its abilities to the progress of the science, the PHOTOGRAPHIC SOCIETY OF MARSEILLES has, at its meeting of the 31st January, 1862, decided on the institution of a general competition for the discovery of an INSTANTANEOUS DRY COLLODION PROCESS; that is to say—Of A COLLODION *which, employed in the dry state, shall admit of the production in full sunshine of a street with figures in motion, similar, for example, to the* Boulevard de Strasbourg, *taken by MM. Ferrier and Soulier, which shall be regarded as a standard of comparison.*

1. The prize to be competed for shall be a gold medal of 500 francs value, and the competition shall terminate on the 31st December, 1863.

2. The samples of plates and descriptions of processes destined for this competition should be addressed, stamped, to M. Leon Vidal, Secretary of the Society, 2, Rue Mazagran, Marseilles, and may be sent on the 1st of June, 1862, and will be admitted up to the 15th of August, 1863.

3. The parcels sent shall consist of sensitised stereoscopic plates, contained (to the number of one dozen) in a grooved plate-box, carefully sealed and light-tight: dimensions of the glass nine centimetres by twenty centimetres.*

4. A paper, descriptive—1st, OF THE NATURE OF THE PROCESS; 2nd, THE METHOD OF DEVELOPMENT—must accompany each package.

5. The first of the above conditions will be required to be rigorously fulfilled only in the case of that process which merits the prize. The Society will publish the formula and the process employed, but not in such a way as to deprive the inventor of his exclusive right of property therein: he will, in fact, be able to work his process profitably, and to improve its value in any way he may think fit.

6. The comparative experiments will all be made on the arrival of the sensitised plates, with the same instrument (a quarter-plate combination, full aperture, of four and a-half inches focus), and under the same conditions of light.

7. The half at least of the members of the jury shall assist at the opening of the boxes and in the experiments, which shall be made with every possible and suitable precaution.

8. In order to test the keeping qualities of the plates, the development of some of them will be postponed from fifteen days to a month, according to the indications of the papers attached.

9. The keeping qualities both before and after exposure will be carefully noted, in order to aid the decision of the jury in those cases where they will have to choose between several instantaneous dry collodions possessing the other conditions named in the programme.

10. Should a case arise in which a prize of 500 francs cannot be justly awarded, but which at the same time merits some acknowledgment, a medal of 250 francs value will be accorded to the person who has or has not taken part in the competition, but has nevertheless contributed by his researches to advance the discovery of a dry collodion possessing uniform and rapid qualities; and the prize of 500 francs will be carried on, with an augmentation of 300 francs, to the end of December, 1864.

11. All the questions arising out of this competition shall be decided by a jury of examiners, composed of fourteen members of the Society. The following are their names: —MM. Gabriel (President of the Society), Leon Vidal (Secretary of the Society), Brenmuller (Photographer), A. Guilbault, Hudelot (Cap. d'Etat Major), Joseph Jacquemet, Alexander Lefevre, Ernest Loire, Meynier (Professor of Chemistry), Alphonse de Proux, Arthur Taylor, Charles Teisseire, Thobert (Photographer), and Tissot.

ON THE SUCCESSFUL APPLICATION OF THE PRINCIPLES OF THE DIORAMA TO PHOTOGRAPHIC PICTURES.†

By ANDREW MACTEAR.

I HAVE much pleasure in bringing before your notice, this evening, a few remarks on a new feature in our art. I need scarcely say to you that photography places before our wondering gaze, at our own firesides, scenes from every clime (which it would never likely be our lot to behold otherways), unapproachable by any other art for its unerring truthfulness. We have views in the Holy Land, on which we look with reverence and awe, from their sacred associations—in sunny Italy, where the arts once triumphed in all their glory—in gay volatile France—in America, with its Niagara Falls and extraordinary scenery—Switzerland, with its glaciers and avalanches—England, with its many pleasant scenes—Scotland,

"With its brown heath and shaggy wood,
Land of the mountain and the flood."

And many other places, rendered sacred either by history, classic lore, or pictorial beauty.

Amongst the many rapid strides which our art has been making within the last few months, it has been my exceeding great pleasure to see and examine one of these strides at the house of our friend, Mr. Alexander Macnab, viz., the photographic diorama, invented by Professor Taylor, who has been ably assisted by Mr. Macnab in bringing it to its high state of perfection.

Previous to the introduction of stereoscopic slides, a good single photograph was considered by the true lover of nature as something wonderful; but, when good binocular views came forth, the wonder and pleasure increased, from the fact that the scenes became more natural. Le Gray's sea and sky pictures have given place to Wilson's stereoscopic views of the same kind; and, as a marketable commodity alone, stereographs are sold as one thousand to one of the single views. From the fact that everything approaching the nearest to Nature herself is sure to command the marked attention and approbation of the most highly cultivated mind, I may safely say that single transparent photographs, coloured with taste and seen through Dr. Taylor's dioramic medium—which gives an extraordinary stereoscopic effect, coupled with the various coloured skies and clouds from the revolving cylinder, which moves at the will of the operator—are, as yet, the most pleasing pictures which have been submitted to the most artistic or scientific mind.

I will now call your attention for a very short time to this new feature in the art, while I describe the apparatus.

1st.—There is a large box, in the front of which are placed the cosmoramic lenses: at the back, instead of the focussing screen, is placed the coloured picture, which has been slightly dimmed to subdue the bright colours from the revolving cylinder.

2nd.—Half-a-dozen jets of gas are placed at the top of the back end of the box, and under a reflector. Wonderful effects are produced by the management of the stop-cock—from brightest daylight blending into twilight, which ushers in the beauteous Queen of Night, who sheds her gentle light on everything around.

3rd.—The revolving (vertical) cylinder (on which is painted effective skies and clouds, beginning with an open clear atmosphere onward changing to stormy effects) being kept in slow motion, and seen through the dimmed photograph, is quite magical; morning, noon, and night pass before you within a very few minutes of time. I observed the grand purpose of dimming the photograph, from a part of one of them being left undimmed: the bright colours on the cylinder were too harsh and distinct, while the dimmed parts rendered the illusion perfect. The photograph being placed between the lenses and cylinder, and at unequal distances, gives an indescribable atmospheric effect, which is greatly enhanced by the passing clouds casting their shadows as they steal across the picture, especially the sunset—

"When the setting sun with yellow radiance lightens all the vale."

I cannot close my remarks without noticing a few of the pictures which were shown:—

1st. *The Old Town of Calcutta*, with its thatched houses and pool of water in the foreground.

2nd. *Indian River Scene*, with its curious shipping.

3rd. *Heathen Temples*, with worshippers.

4th. *Indian Burying-place*, with its peculiar tombs—photographed by Mr. Williamson, of Calcutta: very interesting and choice subjects.

5th. *Avenue Scene at Inverary Castle*, by Dr. Taylor: very artistically chosen.

6th. Another similar.

7th. *Old Oak in Cadzow Forest*, by Mr. Kibble. You could scarcely take away your eyes from this one—it was nature's very counterpart. To the above were added a few scenes by myself from *Morag's Fairy Glen, Dunoon*. Although these were done some time ago, I could not help feeling and saying, like William Tell—

"Ye crags and peaks, I'm with you once again."

There were a great many others, all worthy of praise.

I would like to see some of Mudd's, Wilson's, Bedford's, Heath's, Fenton's, and other great masters' pictures by this mode: it would be a trial of no ordinary kind.

There are members present who have seen the apparatus, and who, I am confident, will corroborate all I have said: they will recollect the pictures I have named, and I hope they will give their opinion to the meeting. I only wish those members who have not seen it had only a glimpse or two of it; that pleasure may yet be given them, however, sooner or later.

Since writing the above, Dr. Taylor kindly invited me, in company with Mr. Macnab, to see some further improvements he had made in his apparatus since I had seen it. Thinking that the previous arrangements were all that could be desired, I was astonished at the additional effects produced by very simple

* This is equal in English measure to 3½ by 7⅞ inches.

† Read at a Meeting of the City of Glasgow and West of Scotland Photographic Society, 6th March, 1862.

means. During a very sultry sky effect vivid flashes of lightning occur; and in the moonlight effects some clouds are seen drifting faster than others across the scene, while the moon is wading through the murky sky.

These effects are produced by the same revolving cylinder; but it has now got skies painted on its inside face, done with great taste and judgment in their harmony. Occasionally a discordant part occurs which increases the effect wonderfully—clearly showing the artistic mind of the Doctor. All these changes are made by simply having a powerful gas jet inside the cylinder, which is used only when the outside gas *is not* used (except when gradually dissolving one effect into another, and giving flashes of lightning, which is done by merely turning the stop-cock to a check and back instantly). A large glass gas shade (placed over the gas on a usual support) is painted with skies with a moon in the centre, and this being moved quicker or slower than the motion of the cylinder, gives the appearance of the wading moon and drifting clouds.

This opportunity presenting itself to me, I feel it my duty to notice a remark by the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY that this invention is not new, and that he had recommended a similar plan to Messrs. Negretti and Zambra. Now, it is right to give all honour to whom honour is due, and we must "render unto Cæsar the things which are Cæsar's;" and I say, most respectfully, that the plan of putting a stationary coloured glass behind an uncoloured photograph, with the reflector behind, is as unlike Dr. Taylor's mode, as night is from day; in fact, the one has an unchanging and the other an ever-changing sky. The Editor surely has not fully comprehended the description of it or he would not have attempted to pluck the laurels from another. I am sure of this, as the editor is well known to be a friend of the art, and, as Marc Antony says, "he is an honourable man."*

MY FIRST PHOTOGRAPHIC TRIP TO THE COUNTRY.†

BY A MEMBER OF THE EDINBURGH PHOTOGRAPHIC SOCIETY.

NOW that a few bright peeps of our friend the Sun give us promise that we shall soon have photographic weather again, perhaps the story of my first attempt at photography beyond the range of my dark room may afford a few hints to those young amateurs who have, as I had at that time, rather more enthusiasm than judgment, and more headstrong belief in their own capacity to overcome the difficulties inseparable from out-of-door photography, than a knowledge of what they consist.

In Scotland we are not allowed many holidays, and most of those we have are carefully christened by our orthodox shepherds "fast days." If the name has anything to do with the acts performed on those days, it must be on the principle of a *lucus a non lucendo*, as in general they are rather looked forward to as days to be enjoyed and marked with a white stone.

The particular day to which I draw your attention was commenced by me in anything but the spirit of fasting, although if you had been at my shoulder during the time consumed in "doing" breakfast you would have said I was making preparation for a very prolonged fast day: *sans* doubt there's no breakfast for a hungry man like a Scotch one. The preliminaries having being gone through, and the meteorological department attended to for the twentieth time, I took a last look to see that everything was right and in its place.

As my field roll may be of service in many respects, on Dr. Culverwell's principle of "What to eat, drink, and avoid," I will annex it. It consisted in the first place of a home-made collapsible camera to suit my three-inch Ross lens. I had the notion I could do most of those little matters far better than the makers; and, although my camera was clumsy, it was at least satisfactorily made, and answered its purpose well. It was light; and although not very portable, could yet be packed away easily enough in my capacious tent, which was made in this way:— I had a stout box, about 32 × 23 × 7 deep, which had done duty in sketching before, and I arranged four light iron tubes about half-an-inch external diameter, and about twenty-nine inches long, which were made to fit into keepers at each corner of the box, on the top of which four pillars the lid was fixed in the same way. The lid, by-the-bye, had about one inch of the seven in depth nailed all round the edge of it in which the upper keepers were fixed, and which allowed of four stout hooks-and-eyes being screwed on outside which fixed the whole affair together after everything was packed inside. On the outside of the bottom of the box I had the feet hinged: they were exactly like the four legs of an ordinary kitchen table, but lighter, and with no top rail at the hinged junction of them with the box, but both had for rigidity bottom rails about eight or nine inches from the spikes. One of the pairs of legs, however, was made to hinge inside the other, and the bottom rail of the widest one was a piece of light hoop-iron to allow both to be flat on the bottom of the box when not in use; and when in use, with its iron spikes driven into the ground, and the legs projecting beyond the line of the box itself about six inches on each side, it looked the very picture of stability, as indeed it was. I have tried many forms of tent, but that is the best I have yet seen for a journey. You might, as I have done, pack in it a Kinnear's 12 × 10 camera, two boxes, with glass sufficient for a fortnight's or a month's journey, bottles, chemicals, baths, and—wash-houses I was going to say—but my cistern was a half-gallon camphine jar, made of zinc, square in form, into which I got a small gas-cock soldered, and with a champagne cork in the top, it formed a cistern fit for a prince—a flat Wedgwood-ware bath for the silver, another for washing (I objected on principle to gutta-percha), 20-ounce bottle of silver solution, 12 ounces of iron developer, crystals of hypo. *ad lib.*, chamois leather and cloths, and any quantity of ounce-bottles of all the other things that might be needed for a journey to the Holy Land, or anywhere else beyond the reach of chemists. By-the-bye, my utmost proposed stretch was less than three miles, to a picturesque castle which had been for some time the residence of Queen Mary and her court.

Well, *revenons à nos moutons:* just as I had completed my preparations, I heard the well-known footsteps of my friends, Emerald Green—whom we nicknamed "Hercules," from his strength (of neck) — and Flake White, who rejoiced in the *sobriquet* of the "Corinthian," from his possession of a remarkably "nobby" head of hair, which we insisted he dressed into the shape of the architectural capital from which he derived his classical cognomen. After the usual compliments were passed, the "traps" looked to, and the weather scrutinised for the twenty-first time, we prepared to start.

I omitted to say that our tent or developing-box had two stout portmanteau kind of leather handles made to fit the hands. Green was a short wiry fellow, and he and I took the handles quite stoutly; and you can hardly conceive how conceitedly we stalked off with the mysterious box of appurtenances, all the small boys round about offering to give us a "lift" if we'd take them with us. One impudent young scoundrel was sure he'd be able to do as well as "Hercules:" another insinuated that we should spoil all the "fotygrafs" if we didn't take him with us. But with an air of contempt and a proud consciousness of superiority, we moved on "with the wide world before us." By the time, however, that we had proceeded about 250 yards we found it wouldn't balance. Well, we'd change hands—so—pretty good for the next 150 yards or so. "I say, 'Corinthian,' take a lift here: this is rather heavy," says Hercules. "All right! here you are!" The camera-stand is handed over, and the "Corinthian" becomes porter, while after a bit I begin to feel considerably used up. "The box ain't properly balanced: the handles are not in the right place. Bah! we'll take a rest," says I. "This is rather queer! A rest before we have got to the toll-house [said toll-house being within a quarter of a mile from my door]! We rested, and shortly started again, but we had'nt gone much farther till the "Corinthian" proclaimed it to be "deuced heavy!" "Suppose we try it upside down," I interjected: "it may balance better, especially as the handles seem to have been fixed on rather low, making it top-heavy; perhaps it will trim better." No sooner said than done: of course the hooks are strong enough, so off we went again. "Ah! that's better. That's something like the thing: it balances better now." And so we proceeded for about a score of yards, when—must I say it—crash went the box, out flew baths and bottles and lens and camera, and "in the twinkling of a bedpost" the road was converted into a *negative* printing-bath. The silver bottle broke, and made a nice mixture with the developer, and the small bottle of pyro. assisted the whole to make a mess of inky blackness known to those who are fond of trying mixtures. The fabulous quantities of different kinds of collodion that disappeared in the smash I am afraid to speak of in case I should not be believed; but those who have gone out for the first time, fully provided against all failures, will be able to estimate it. We stood *fixed* in astonishment, and our feelings had well nigh *developed* themselves into despair when I started up with "Why dwell on it, boys? in with the *debris!*" and in the *whole*—not the broken—lot went.

(To be concluded in our next.)

* See Leader.—ED.

† Read at a Meeting of the Edinburgh Photographic Society, March 5, 1862.

A DISPUTE ABOUT A NEGATIVE.

MASON *v.* HEATH.

On the 28th ultimo an action was tried in the Court of Common Pleas, at Guildhall, between Mr. Mason, of Paternoster-row, London, photographic publisher, and Mr. Vernon Heath, lately sole representative of the firm of Murray and Heath, of Piccadilly, the dispute having reference to the possession of a negative portrait of H.R.H. the late Prince Consort.

It appeared from the evidence that the plaintiff had made application for permission to publish a photographic portrait of His Royal Highness in a work entitled *The British Portrait Gallery*, and in reply had received intimation, through the agency of the Prince's private secretary, Mr. Ruland, that the permission sought was conceded, but stating at the same time that His Royal Highness was about to sit for a portrait for another purpose to Mr. Vernon Heath, and, in order to save the Prince unnecessary trouble, the plaintiff was directed to communicate with Mr. Heath, and make his arrangements with that gentleman for taking the additional negative. In consequence of this communication, plaintiff sought an interview with the defendant: the account of what took place at this interview was, however, as given by the respective parties concerned, very contradictory.

The plaintiff alleged that the defendant *had agreed* to take the negative for him *in duplicate:* that the price to be paid for the two negatives was discussed, though not definitely settled, the plaintiff proposing to pay one guinea per negative, as he had been in the habit of paying for the same kind to Mr. Kilburn, Mr. Mayall, Mr. Williams, Mr. Watkins, and other photographers of high standing; but in the event of Mr. Heath having to attend at the palace to execute the work, he (the plaintiff) would be content to pay a guinea or two in addition for the extra trouble incurred: that the defendant said he knew Mr. Kilburn, and would consult with him regarding price to be charged, or would refer the question of price to M. Claudet or Mr. Lake Price.

The defendant averred that the plaintiff had not given a truthful account of the interview; that the latter had at first come to him with a statement to the effect that he (the plaintiff) had to submit Mr. Heath's name in conjunction with those of two other photographers for selection by the Prince—a statement which defendant knew to be untrue, having previously been informed by Mr. Ruland of the nature of the intimation sent to plaintiff; that defendant felt himself insulted by plaintiff's conduct in this want of veracity, and at first declined to negociate with him; that subsequently, however, he did discuss the matter, but positively denied any undertaking to produce two negatives, or that any actual agreement about price to be charged was arrived at.

In due course, on the Tuesday following the interview already spoken of, His Royal Highness sat to Mr. Heath in that gentleman's studio in Piccadilly, upon which occasion four negatives were taken, proofs from which having been submitted for approval to Her Majesty the Queen, one of the negatives specially indicated was assigned to Mr. Mason, one to the Social Science Congress, one was directed not to be published, and the fourth, we believe, was appropriated to Mr. Heath's own use.

The plaintiff stated that he sent repeatedly to Mr. Heath's for his negatives, without being able to obtain them.

Defendant showed that he was not empowered to part with *any* until nearly a month after they were taken, and then only with one to the plaintiff, for which he informed him he should make a charge of fifteen guineas. He admitted that for a negative of an ordinary sitter his charge would be five guineas, but alleged that under the circumstances of the case, the Prince having (as he assumed it) declined to sit except to himself, he was fully justified in such charge.

Many witnesses were examined on both sides, including some whose names are well known to most of our readers—as for instance Mr. Kilburn, Mr. T. R. Williams, Mr. Herbert Watkins, Mr. Melhuish, Mr. C. J. Hughes, Mr. Simpson, and others; and a mass of evidence was given that in our opinion had little or no bearing upon the real point at issue between the parties—such as the excellence of the one negative allotted to the plaintiff, the number of proofs that could be taken from it in a given time, the price that would have been charged for the negative to the plaintiff had the witnesses taken it, and so on—whereas, except by the principals to the suit, no evidence was offered as to the existence or otherwise of any specific contract, and none that the question of price had been referred to either of the gentlemen proposed.

The trial occupied the entire of one day's sitting of the Court.

The verdict appears not very clear, being as follows: "We find that there was no contract for two negatives, but think the plaintiff ought to have the one negative on payment of five guineas."

The preceding verdict appears very like "Not guilty—but he is admonished not to do it again;" and may well be classed with the celebrated verdict that was actually proposed by a country jury in a case of theft, viz.—"Not guilty, if he leaves the town."

Unless some private arrangement be made between the litigants it is not improbable that the whole question may be re-discussed in a higher court.

The following letter from the defendant's solicitors appeared in the *Daily Telegraph*, in reference to the report of the trial as given in that paper, which, we must admit, presented very little information relative to the points in dispute and the merits of the question at issue:—

MASON v. *HEATH.*

TO THE EDITOR OF THE DAILY TELEGRAPH.

Sir,—We shall be obliged by your permitting us to correct some important errors in your report of this case in your impression of to-day. Probably the lateness of the hour at which the case ended, and the somewhat involved nature of the verdict, were the cause of your reporter failing in his usual accuracy.

By your report it would appear that Mr. Mason had engaged Mr. Heath to take the late Prince Consort's portrait for five guineas; that Mr. Heath afterwards charged fifteen guineas; that this charge was the real subject of the contest; and then the report says, "The jury returned a verdict for the plaintiff for one negative on payment of five guineas." In fact, the action was brought expressly for an alleged contract to deliver two negatives. Mr. Heath's case was—that he had no contract with Mr. Mason at all; that the Prince Consort had himself selected him, and was coming to sit to him for portraits for his Royal Highness's own purposes; that he authorised Mr. Heath to deliver one negative to Mr. Mason on a proper payment; and that he had never engaged to deliver two; and that all the other negatives taken were the Prince's own property. Mr. Heath also contended that fifteen guineas was a reasonable sum to charge for the one.

The jury found a verdict, not for the plaintiff, but for the defendant (Mr. Heath), on the ground that there was no contract to deliver two negatives, as alleged in the declaration. They added to their verdict an expression of opinion that Mr. Mason should have the one negative on payment of five guineas; and the Judge on this reserved leave to the plaintiff's counsel to move to enter the verdict for him, with nominal damages of £20, if the Court should be of opinion that any effect could be given to this part of the finding of the jury upon the pleadings.—We are, sir, yours, &c.,

PARKE & POLLOCK, Solicitors for Mr. Vernon Heath.

Lincoln's Inn-fields, March 1.

Since the preceding was in type we have received the following:—

MASON v. *HEATH.*

To the Editor.

Sir,—Mr. Mason, the plaintiff in this action, has, in letters to some of the daily papers, reiterated what he stated in the witness box, and, although the jury by their verdict discredited Mr. Mason's account of what had passed between us, these statements may, if uncontradicted, do me serious injury.

Permit me, therefore, to repeat what I said in the witness box, viz.:—It is not true that I received or accepted any kind of order from Mr. Mason, and it is equally untrue that I ever told him, or implied in any way, that I had two negatives for him. Of this I convinced the jury by other evidence besides my own. Mr. Ruland, librarian and secretary to His Royal Highness, gave evidence that His Royal Highness, who had seen certain photographic portraits taken by me, had himself expressed his intention (without any sort of application from me) to sit to me for some portraits he desired to have taken, before he consented to the application made by Mr. Mason; and that Mr. Mason's application having been renewed at this time, His Royal Highness had arranged that an additional negative should be taken for his publication. Mr. Mason thereupon received directions to furnish me with the necessary particulars for its execution. I will say nothing here upon that portion of my own evidence which detailed the manner in which Mr. Mason attempted to mislead me as to what his instructions really were. Mr. Ruland proved that the Prince sat to me in my studio on the 2nd of July, that he attended him, and that four distinct negatives were taken. Mr. Ruland also proved that His Royal Highness stated, in reply to an inquiry from me, that he would not then come to any decision as to whether Mr. Mason should have any one of the four negatives, and that Mr. Mason was to be so informed.

A month afterwards His Royal Highness's decision was communicated to me in a letter which was read in evidence. By this letter, in the clearest and most explicit terms, I was instructed to let Mr. Mason have one of the four negatives. This I communicated my readiness to do, and named a price for its delivery which I still consider a very reasonable one—one, at all events, which could not be governed by any agreement or bargain he may have previously made with other persons for other portraits. It was at this juncture, and no doubt in ignorance of the actual circumstances under which the Prince came to me, Mr. Mason set up a claim for two of the four negatives. My instructions were clear. I had but authority to deliver one, and hence the action—*an action which was expressly brought upon an alleged contract on my part made the 29th of June, to deliver two negatives for a price named.* I was advised, and believed, that the facts herein stated were sufficient for my defence; but as Mr. Mason still thinks the question unsettled, permit me to say that, for the purpose of putting my position beyond doubt, at an early stage of the action I wrote to Windsor for further instructions, and received the following reply from Mr. Ruland, dated—

"*Windsor Castle, Nov.* 24, 1861.

"As far as the question is concerned as to *what number* or *which* of the negatives taken by you in July last you were to give up to Mr. Mason, I can only refer you to my letter of the 5th of August, in which I distinctly stated and described as plainly as possible the *particular and only negative* which, in compliance with His Royal Highness the Prince Consort's commands, you were to hand over to Mr. Mason for publication in a certain work, a copy of which had been submitted by Mr. Mason when he first applied for the permission to insert a portrait of His Royal Highness into the said publication."

Mr. Mason, in his letter to the daily press, challenges some jurymen to state the actual meaning of the recommendation attached to the verdict. I cannot, therefore, help remarking that I believe that the jury would have considered any such recommendation superfluous had they known that I, and all connected with me, had used our best efforts to prevent the action being tried. The following proposals were actually made:—

In the first place I stated my readiness to refer it to the President of the Photographic Society; then (after His Royal Highness's death) to Sir Charles Phipps; and then, at the suggestion of Sir Charles Phipps, to another gentleman; and in every instance I offered unconditionally to put my case in the hands of the persons named. It should be stated further, as can be proved by my letters, that I should have been too glad to let Mr. Mason have *the* negative *at any time, upon any terms*, had he been willing to content himself with the only one I had the power to give him.—I am, yours, &c., VERNON HEATH.

43, *Piccadilly, London, 5th March*, 1862.

COPYRIGHT IN WORKS OF ART.

(House of Commons, 13th Feburary, 1862.*)*

The Solicitor-General, in committee of the whole House, moved for leave to bring in a bill on this subject. Having shown what was the present state of the law of copyright, he said the object of the present measure was to give copyright in paintings, drawings, and *photographs*. The copyright would last for life and seven years afterwards. With regard to the question between the author of a work and the purchaser, it was provided that the purchaser should have the copyright as a matter of course, unless it were expressly reserved in writing at the time of the sale. Another object of the bill was this:—It was found that a considerable traffic was carried on in spurious pictures, which were palmed off upon the public under the names of artists of eminence, whose reputation suffered at the same time that the public were imposed upon. It was proposed to make that a positive misdemeanor, and to prohibit it under penalties. There were some questionable penal clauses in the former bill which would not be found in the present; but in other respects it would be the same. He would only add that it was of considerable importance, if the principle of the bill were approved of, that it should pass without delay; for otherwise foreign artists, who would have a copyright in their works in their own countries, would in the forthcoming Exhibition be placed in this position, that they should either withhold their works or be exposed to the danger of having their copyright invaded, and, therefore, it seemed to him a good opportunity for introducing a supplement to the existing Act.

Sir M. W. Ridley said that the learned Solicitor-General's predecessor had introduced a bill of a similar character last session, which had a wider range than the present; and as some objectionable matters had been eliminated from the former, he merely wished to ask whether the learned gentleman would make the present bill apply to plastic art, which would be equally necessary with regard to the exigencies of the approaching Exhibition.

The Solicitor-General replied that there was a law of copyright in existence touching the matter referred to by the hon. member. Casts and models were already protected in this country for a period of 28 years from the time of their first production, and, by virtue of the treaties relating to international copyright, foreign artists would have their works of sculpture protected by that Act of Parliament. The only reason why the former bill included plastic art was, that it had been proposed to repeal the existing acts. But many provisions of the former bill were deemed to be objectionable, and therefore they thought it better that the present bill should merely establish a copyright in that branch of the fine arts in which it had not existed, and thus prevent the fraudulent practices to which he had referred.

Leave was then given to bring in the bill, which was subsequently read a first time. It was read a second time on the 6th inst., and the next stage of the bill is at present fixed for the 17th inst.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at King's College, on Tuesday, the 4th instant. James Glaisher, Esq., F.R.S., occupied the chair.

The minutes of last meeting were read and confirmed, after which Mr. Charles Frederick Bayley was elected a member of the Society.

The Chairman directed the attention of members to some well-executed photographs of London Churches, and especially to those of St. Paul's Cathedral. The pictures were taken and exhibited by Mr. J. J. Cole, architect to the Stock Exchange, who intends ultimately to make a complete set of the Churches of London, giving especial prominence in the series to the works of Sir Christopher Wren. If Mr. Cole is equally successful throughout the entire list of London Churches (the photographing of which involves no small peril to life and limb), architects will doubtless gladly avail themselves of the opportunity thus afforded of furnishing themselves with copies of the series, while photographers will be no less gratified to see their art receive so useful an application.

M. Joubert exhibited some burnt-in photographs in illustration of a paper which he read that evening before the Society.

The Secretary read a letter from Herr Koncke on a new printing process, the details of which he was desirous of selling to the Society.

The Chairman remarked that as Herr Koncke admitted that his process was at present imperfect, his statement in reference to the permanency of the prints must be received with a great deal of caution, lapse of time being required to substantiate such an assertion.

Mr. Shadbolt desired to remind the Chairman that it was one of the rules of the Society not to discuss secret processes: he would move, therefore, that discussion on this subject be not encouraged, especially as the matter had previously been laid before another Society.*

Mr. Watson submitted some specimens of albumenised paper for examination, in quantity sufficient for each member to take a sheet and practically test its qualities.

The Chairman then requested M. Joubert to read his paper *On Burnt-In Photographs in Enamel Colours.* [See page 101.]

At the conclusion of M. Joubert's paper the Chairman invited discussion on its subject matter, remarking that the members could not but feel indebted for the interesting facts which had been brought under their notice, and highly gratified by the sight of the very beautiful specimens exhibited in illustration of the paper. These latter, he thought, left but little room for improvement: still there *was* room, and he was of opinion M. Joubert would not rest until he had attained perfection.

Mr. Shadbolt congratulated M. Joubert on the progress he had made since he last had the pleasure of examining his specimens. One marked improvement was the substitution of enamelled opal glass for ground-glass; he would, as a further improvement, suggest the possibility of avoiding the reversal of the pictures by taking advantage of the method usually followed when it was desired to take a direct transmitted positive in the camera—that of exposing the negative for an instant to daylight just after commencing the development.

M. Joubert expressed himself indebted to Mr. Shadbolt for the suggestion, which he thought a good one: he would certainly carry it into practice. He stated, however, that at present he obviated the inconvenience of reversal by taking a transmitted positive in the camera through the glass on which the negative was taken.

A Member asked, in reference to a coloured photograph on glass exhibited by M. Joubert, whether, in the production of that variety of colours, it was necessary to possess the skill of an artist?

M. Joubert replied that the pictures were not produced in colours at first, but in monochrome. The subsequent application of the ceramic colours certainly did involve the exercise of some taste and skill, though, perhaps, not so much as that required by an artist in painting an original picture with no outline to guide him.

The Chairman announced that Mr. England would exhibit some instantaneous and other views of Paris and America. They would be enlarged on the screen ten feet square by the aid of the magic lantern, so as to be seen by all the members at once. Mr. England had not prepared a paper on the subject, but would be happy to answer any questions put to him as to the process followed in the production of the pictures.

A very desultory discussion then ensued in the darkness necessary for the exhibition of the pictures, and during the course of which it was elicited that the original negatives of the instantaneous views of Paris were taken by the wet collodion process, with a Dallmeyer's three-and-a-quarter-inch focus stereoscopic lens; and that in the production of the transparent positives now under examination the tannin process was followed, developing with pyrogallic acid and a very small proportion of silver, which he found most conducive to the production of that beautiful warm tone which gentlemen present so much admired. The shutter he used differed only from the most simple forms in being placed *inside* the camera and close to the plate rather than outside the lenses.

The members were entertained for more than half-an-hour by the inspection of these photographs; at the end of which time

The Chairman read a letter from M. Claudet [see page 106], on the inauguration of an Exhibition of Photographs under the auspices of the Society, with the object of compensating for the deficiency of space in the building of the International Exhibition at Kensington.

When the reading of M. Claudet's letter had been concluded,

Mr. T. Sebastian Davis said that as he had been foremost among a band of gentlemen connected with the South London Photographic Society in negotiating with the Crystal Palace Company on a matter similar to that which formed the subject of M. Claudet's letter, he felt, in a measure, bound to address the meeting. He deprecated the idea which had somehow obtained that the Society of which he was a member had come forward in opposition either to that central Society or to the committee of the photographic department at the Exhibition. Such he could assure the meeting was by no means the case. The South London Photographic Society had come forward cautiously, with the view of opening up an opportunity for the more efficient exhibition of the capabilities of English photographers before the large multitudes of people who would congregate from all parts of the globe; to exhibit these productions, in fact, on a scale commensurate with the acquirements of British photography in 1862. He was aware that there was to be an Exhibition of English photographs at Kensington, but every one knew it was most inadequate for the purpose; and, in the absence of any more central and, at the same time, inexpensive accommodation, he thought that photographers could not do better than avail themselves of the handsome offer made by the Crystal Palace Company, which was the gratuitous use of a space in one of their galleries in every way suitable for the purpose. He (Mr. Davis) was under the impression that the central Society was in a manner pledged to aid only the photographic arrangements connected with the International Exhibition, so that it could not honourably come forward to join in any other project of a similar nature. If, however, that were happily not the case, he (Mr. Davis) was sure he should only be expres-

* See page 50 of present volume

sing the sentiment of the South London Photographic Society when he offered to lay before the Council of that (the central) Society the details of the communications which had passed between the South London Photographic Society and the Crystal Palace Company in connexion with the subject.

The CHAIRMAN, in reply to the latter portion of Mr. Davis's remarks, said he was not aware that the Society was compromised in such a way as to prevent its joining in any kindred project, which he, therefore, thought himself justified in declaring it was free to do.

Mr. SHADBOLT, without animadverting in any way on the conduct of any other Society, either provincial or suburban, would direct the attention of that Society to one point, which was, that in his opinion *the* Photographic Society would be yielding the position which it ought to occupy before the world if it allowed such an Exhibition of Photographs as that then demanded to be inaugurated by any other Society than itself. He (Mr Shadbolt) had received numerous expressions of opinion in writing from various parts of the kingdom (and of this he had informed the Secretary), to the effect that a supplementary Exhibition of Photographs was absolutely necessary; and that it was highly desirable—and, in fact, only proper—that the initiative in the matter should be taken by the central Society.

Mr. DURHAM concurred in the opinion expressed by Mr. Shadbolt, but assured the meeting that there was great difficulty in obtaining a suitable place in which to hold the Exhibition; for, at the very time of year when they were most wanted, the only rooms in London advantageously situated were engaged. He (Mr. Durham) was sure the Council would be much obliged to any gentleman who would point out a proper room for the purpose.

Mr. SHADBOLT intimated that the difficulty put forward by Mr. Durham would perhaps prove a serious one in ordinary times, but now it only existed to be overcome. If M. Claudet's suggestion as to guarantors were followed out, he thought there would be no difficulty in obtaining a room. He thought the locality not very important so it were not far from the centre. He would suggest the room known as the German Fair, opposite the Polytechnic; or perhaps accommodation might be found in the Polytechnic itself, using the Cavendish Square entrance.

The CHAIRMAN said the Council were desirous of inaugurating such an Exhibition as the one now under consideration. He regarded Mr. Shadbolt's suggestion as a good one, and thought that gentlemen present, without going through the formality of appointing a Committee, might gather information as to the most suitable place for the purpose, and report to the Council. The complete execution of M. Claudet's plan would involve a large space; but, as reporter and examiner in the Exhibition of 1851, he could not but be aware that the real progress made in photography since that date would not be adequately represented without more extended space than that allotted to the purpose at the Exhibition building.

Mr. NOTTAGE, with the view of arriving at a definite conclusion on the subject, suggested that this meeting should appoint Mr. Shadbolt and M. Claudet as a sub-committee to make inquiries relative to the matter now under discussion, and report the result at the next meeting of Council.

Mr. HENRY POLLOCK regretted the absence of M. Claudet, who could have taken an important part in the discussion. Without impugning the patriotism or public spirit of that class of gentleman who would be likely to act as guarantors, he still thought that their number would be very limited, and that there would be great difficulty in obtaining even a few to come forward in that character, when it was remembered that there would be no financial advantage accrue to the guarantors. Bearing in mind, also, the facts that no building was as yet appropriated for the purpose, that no list of exhibitors was extant, and that even the preliminary advertisements had not yet been issued, he (Mr. H. Pollock) thought it was hardly likely that the Exhibition could be opened by the first of May; and as an enterprise such as was then contemplated had better be let alone than half carried out, he thought matters had better be so arranged that visitors from abroad and from the provinces should have rather to complain of the quantity than the quality of the photographs exhibited. He also thought it far from wise to appoint a Committee not connected with the Council.

Dr. WRIGHT thought the last speaker had not rightly understood M. Claudet's letter, in which it was intended to convey the idea that it was not imperatively necessary to open the Exhibition exactly on the 1st of May, but only some time during the time of the International Exhibition.

Various places suitable for the exhibition of photographs were then suggested in a somewhat desultory manner; one gentleman remarking, in reference to St. James's Hall, that he, in connexion with a bazaar committee, had hired a room in St. James's Hall for *three days* and had been charged *ninety pounds* for that short time.

The CHAIRMAN, in conclusion, said that the subject had been discussed at some length at the last meeting of the Council, and he hoped that if any gentleman should hear of a room possessing the necessary qualities he would kindly communicate with the Secretary of the Society.

The meeting was then adjourned to Tuesday, the 1st of April.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary monthly meeting of this Society was held on Wednesday, the 5th instant,—Mr. Parry, Vice-President, in the chair.

Mr. Kershaw presented six photographs for the Society's portfolio. One of these was a copy of an engraving taken by Mr. Dallmeyer's triplet lens, and was nearly the size of the original. The margin was perfectly straight and square, and the definition in all parts was beautifully rendered.

The CHAIRMAN said that Mr. Sidebotham, who was unavoidably absent, had requested him to present a copy of the titlepage of the *Photographic News*, very nearly the size of the original, and taken with one of Mr. Dallmeyer's triplet lenses by Mr. Wardley. This, as in the case of Mr. Kershaw's photographs, exhibited qualities rarely met with in full-sized copies.

The SECRETARY remarked that he could appreciate the difficulties of obtaining such copies as these, he having had some experience in that direction. Copies were easy enough so long as a considerably reduced result was desired; but, when it was sought to obtain a negative approaching the original in size, then no lens but one of very superior capabilities would answer.

The CHAIRMAN said he had also been requested by Mr. Sidebotham to lay before the meeting a print he had received from Mr. Woodbury, of Batavia. The negative was taken in a stereoscopic camera with two lenses, and at two operations, so as to obtain a panoramic effect. It was quite impossible for the unassisted eye to detect the junction of the two exposures. So complete, indeed, was the union that it was considered there must be some error in the description, and that the whole had been exposed together. By the aid, however, of a powerful lens a faint line was discovered which showed there had been two exposures. He (the Chairman) had himself tried a similar thing, but with one lens. He first of all focussed for one part of the picture, then for the next after turning the camera upon its centre, making a mark to denote the point to which it was to return after the first exposure, and he thus obtained a panoramic picture; but he had not taken the precaution to use a spirit level, and he therefore had one part of the picture higher than the other. His experiment, however, was sufficient to show that the thing could be done if the camera were arranged perfectly level. Some doubts were entertained as to whether it was really intended to be understood that a binocular camera was employed; and the method by which such an exact junction was obtained seemed to require further explanation.

Mr. PETSCHLER suggested that the picture might be produced by causing the camera to turn upon a point coincident with the stop, if a single lens were used, or with a point mid-way between, if double lenses were employed. This he illustrated by a diagram upon the black board.

Votes of thanks to Mr. Sidebotham, Mr. Kershaw, and the Chairman closed the proceedings.

Since the meeting, the Secretary has seen Mr. Sidebotham, and has ascertained that Mr. Woodbury used an ordinary binocular camera without any special arrangement. One-half of the picture was taken with one of the lenses, the other being closed, and then the other half with the second lens, the camera having been turned to a point previously registered. In focussing for the two exposures it is necessary to make the one picture slightly overlap the other, but this does not cause a line of demarcation, the light gradually softening from one image to the other. The chief thing is to take care that the camera is perfectly level.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE monthly meeting of this Society was held in the Hall, 51, George Street, Edinburgh, on Tuesday evening, the 11th inst. The chair was occupied by Sir David Brewster, K.H., F.R.S., President of the Society.

The room was decorated with pictures selected from the recent Exhibition for presentation to the members. These included the select works of Mudd, M'Glashon, Heath, Annan, and others, mentioned in the notices of the Exhibition which lately appeared in our pages, as being chief contributors to it.

The Secretary having read the minutes of the last meeting, Sir David Brewster read a paper *On the Stereoscopic Pictures Executed in the 16th Century, by Jacopo Chimenti.* [See page 105.]

The photographs alluded to by Sir David were handed round among the members, one of whom (Mr. J. T. Taylor) has furnished us with the following remarks:—

"The particular copy of these interesting pictures which I saw was untransposed, just as taken, and, from Sir David's description, requiring convergence of the optic axes before it could be seen in the proper relief. Now possessing, as I do, the power of viewing the picture stereoscopically, whether they are mounted in proper positions, or transposed, it was no difficult matter for me to apply this faculty to the pictures in question. I accordingly examined them first with the axes of the eyes *parallel*, just as we examine a properly-mounted stereoscopic diagram without the stereoscope. In this position it did not require more than a second's inspection to make it evident that the effect was pseudoscopic, exactly as it should have been from Sir David's description. I then caused the axes of my eyes to *converge*, and the converse of the former result was apparent—the image stood out in perfect stereosity. How Professor Wheatstone and his friends could arrive at such a different conclusion in such a very simple matter of fact as the present one, is to me somewhat inexplicable; and that these pictures were examined by the members of the French Photographic Society, 'with the greatest care, but without detecting in

them the slightest difference," augurs indeed but little for the qualities of their perceptive faculties. There is no doubt whatever of their being possessed of all the necessary stereoscopic relief—such relief as, with our eyes at their present distance apart, we are accustomed to see every day. The effect might have been more astonishing and decided had Chimenti drawn his figures from the widely different points of view selected by many stereoscopists at the present day, with the view of producing 'sensation effects;' but I think he has shown more truth and good taste by following what appears to be the *natural* way of determining the proper relief. Sir David Brewster is entitled to the thanks of the Edinburgh photographers for giving them an opportunity of seeing and deciding on the merits of these famous historical pictures."

There was no conversation or discussion on the subject, but Professor Archer, in seconding Mr. Scott Elliot's motion of a vote of thanks to Sir David Brewster for his paper, took occasion to observe that, while recently examining some antiquities in the Royal Institution of Liverpool, his attention was directed to an instrument which he and those who examined it along with him thought to be a stereoscope. It was a long-shaped box, with two lenses in the end. He was uncertain as to the exact date when it was made, but he thought it was in the year 1670.

Professor Archer then exhibited a large and interesting collection of photographs of objects of interest in the Madras Presidency, taken by the government photographer, Captain Tripe, and which had been placed in the National Industrial Museum in Edinburgh. One of these was a panoramic picture, several yards in length, of the inscription round the basement of the great pagoda at Tanjore. These photographs were examined with much interest.

The award of the medals for the best pictures in the Exhibition was then to have been made; but, in the absence of the recipients, the Secretary was requested to transmit them.

The works selected from the Exhibition this year were distributed among the members.

Mr. C. J. Burnett then exhibited a variety of prints prepared with uranic and other salts, and toned with platina, palladium, and gold. He accompanied these with a description, which he was requested to write for insertion in the Society's Journal.

The meeting was then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on Wednesday, the 5th instant,—George H. Slight, Esq., Vice-President, in the chair.

The following gentlemen were admitted as members:—Messrs. John Cruikshanks, John M'Crindle, and John M'Kelvie.

One of the members then read a paper entitled *My First Photographic Trip to the Country.* [See page 111.]

The paper elicited some interesting and humorous conversation, in which several members also gave their "experiences" of photographic visits to the country.

It was intimated that one of the Society's popular evenings would be held that day week, when Professor Piazzi Smyth would, by means of the oxy-hydrogen lantern, exhibit and explain the photographs he had taken whilst in Teneriffe.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held on Thursday, the 6th inst., in the Religious Institution Rooms. Mr. Mactear, Vice-President, having to describe the apparatus recently invented by Dr. Taylor, Mr. Robb was called upon to officiate as Chairman.

The minutes of the previous meeting having been read by the ex-Secretary, Mr. John Cramb, the private business of the Society, as intimated by circular—the election of President—was entered on, and resulted in the choice of Mr. John Douglas.

The Chairman then called upon Mr. Mactear to open the business of the evening, by reading a paper *On the Successful Application of the Diorama to Photographic Pictures.* [See page 110.]

Mr. Mactear, after giving a lucid description of the apparatus invented by Dr. Taylor, expressed his willingness to still further elucidate the subject by answering any questions which might be put to him.

Mr. John Cramb, in reference to the paper, said he considered Mr. Mactear had done a legitimate service, not only to photography, but to the Society, in thus bringing the matter before their notice, as, although he had read accounts of it in different prints, still he had some difficulty in forming a proper opinion as to its real merits; and, as it had already been made the subject of discussion by another party, he also was desirous to learn what claim the invention had to originality. Was it in looking at a picture through a magnifying glass? If so, in that there was nothing new. The invention, so far, would suit any class of pictures; but why was the photograph selected? He could imagine simply because it approached the nearest of any picture to nature. Then, in regard to a coloured medium, there was nothing new in that, as a coloured medium by which different effects could be produced had been suggested long ago. It appeared to him that the only claim to invention the apparatus had lay in the idea of the revolving cylinder by which various aërial effects could be produced.

Mr. James Cramb wished to know whether an exact scale in regard to the size of the picture exhibited was preserved, or whether the same apparatus would suit any picture taken, irrespective of distance?

Mr. Mactear, in reply to Mr. James Cramb, said he had no doubt that such points had been duly taken into consideration by Dr. Taylor, whose knowledge of such matters was anything but superficial.

Mr. James Ewing remarked, in reference to what Mr. John Cramb had said, that he was not at all disappointed at the claim to originality being disputed, as the principles of the diorama had been long understood, and, as everyone knew, had been applied on a large scale. Nor was he of opinion that the paper claimed such invention; but, as was broadly stated in the heading of articles he had read on the subject, the invention consisted in the *successful application of the principles of the diorama to photographic pictures.* He did not perceive any similarity between the coloured glass proposed (which he understood to be a fixed effect) and the present application, as by the introduction of the revolving cylinder the varied effect of light and shade, cloud and sunshine, were produced. It was quite apparent that much of the merit lay in the artistic obscuring of certain parts of the picture, leaving yet sufficient light to penetrate even the deepest parts of the shadow, so that the objects on the earth were in a measure tinted by the varying aspects of the sky. He was highly pleased with the application, and thought it was indeed a stride.

Mr. James Cramb thought that the stock effects on the cylinder would not suit all pictures, as by the revolution clouds belonging to one picture would merge into another.

Mr. Robertson, who had seen the apparatus, replied that it was not necessary to keep the cylinder in perpetual motion—that it could be regulated by the slightest touch—and the sky most in keeping with the picture shown could, by a gentle motion, be kept long enough before the eye to permit of its being looked at. He thought there was one important point overlooked in the paper, and that was the under reflector, which threw up the light from below, thus economising a certain portion of illumination which otherwise would be lost.

The Chairman thought there could be no end to variety, seeing that the cylinder could be made to any extent, and that the pictures could be so finely coloured.

After a spirited conversation on the subject, in which Messrs. Brown, Kennedy, Dickson, and others took part,

Mr. John Cramb said that he wished to call attention to an article in the *North British Review,* from the pen of Sir D. Brewster, purporting to be a history of photography during the last 15 years. He could not but notice the inadvertence of the author in not noting the name of the late President of the City of Glasgow and West of Scotland Society. Mr. Cramb contended that Mr. Kibble's name should be recorded as the first to produce an instantaneous picture on a dry plate (collodio-albumen). His picture of the *Express* steamer was the first, and was a really wonderful production; and not for that alone, but for the execution of the largest pictures on one plate that have yet been exhibited, viz., thirty by forty inches. Mr. Kibble's name deserved an important and honourable place in a history of the progress of our art.

Mr. Mactear begged to second the remarks of Mr. Cramb, as he thought that if any gentleman deserved to have his name recorded in connexion with photography it was Mr. Kibble.

Mr. Robertson, whilst agreeing with the remarks of Messrs. Cramb and Mactear, thought that Mr. Kibble's pictures were the largest up to the present time, but that he had read lately in an American print of larger pictures being produced.

Mr. Cramb and Mr. Mactear seemed to be unanimous in opinion that such rumours should be regarded with caution, as most of the pictures so spoken of were generally found to be in different parts.

After a vote of thanks to Mr. Mactear for his paper, and a similar compliment to the Chairman, the meeting adjourned.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

A meeting of the above Society was held on Friday, the 28th February,—M. Gabriel, President, in the chair.

The President, after having announced the admission of M. Dupont as a subscribing member, acknowledged the presentation to the Society, by M. Leiber, publisher, of Paris, of the *Popular Treatise on Photography,* by M. van Monckhoven.

M. Poitevin promised by letter to present shortly a pamphlet relative to the various processes published by him at different times.

The thanks of the Society were accorded to MM. Leiber and Poitevin.

M. Leon Vidal, director of the scientific discussions, requested the assistant Secretary to read the fourth *mémoire* of M. Nièpce de St. Victor on heliochromy. Although this *mémoire* had been already presented to the Academy of Sciences, and published in the various journals, he thought it right to read it, in consequence of the delicate compliment paid by the author to the Marseilles Photographic Society in addressing to it the original manuscript with his own hand.

The reading was listened to with much interest, and the President expressed the thanks of the Society to M. Nièpce, after having remarked upon the importance of the researches.

M. Jacquemet, the Assistant Secretary, read the report of the commission (MM. Hudelot and Terris) on the pressure-frame invented and presented by M. Ponson, as follows:—

"The first condition which a pressure-frame should satisfy, and that

which M. Ponson's fulfils to perfection, is perfect contact between the negative and the paper. This is accomplished by means of two wooden shutters, covered with velvet, which are articulated to the pressure-board in a novel and ingenious manner. The shutters, instead of being connected by hinges, are separate, each one being connected to the pressure-bar, which is attached to it by two hinges placed perpendicularly to the axis of this bar. This novel arrangement possesses considerable advantages. If one side of the negative happen to be thicker than the other, the shutter turns on its hinges, and the pressure is equalised.

"When one of the shutters is raised to examine the proof, no movement is communicated to the other shutter, no matter what may be the size of the negative as compared with the frame; and there is no fear of its sliding when examining the proof—an accident which frequently happens with the pressure-frames of ordinary construction.

"In conclusion, the Committee are of opinion that M. Ponson's patent pressure-frame is adapted to replace, advantageously, those in ordinary use."

The Report was unanimously approved.

M. HUDELOT said that the mode of closing the pressure-frame appeared to him capable of improvement, and delineated before the meeting the form of an automatic catch, with a fine-threaded screw to regulate the pressure.

The thanks of the Society were accorded for the suggestion.

M. JACQUEMET communicated the result of his experiments on dry collodion.

The reversed Taupenôt process—that is to say, collodion upon glass previously covered with sensitised albumen—had given no result susceptible of any new or useful application. The image thus obtained appeared more rapidly on development than when the collodion formed the subjacent film.

He then indicated the employment of opium introduced into the collodion to preserve the sensitiveness when dry, which substance had appeared to him to possess a preservative property similar to that of resin. He exhibited in corroboration a stereoscopic plate remarkable for delicacy of detail, and obtained in full light in two or three seconds of time, proving that collodion thus prepared preserves exalted sensitiveness. M. Jacquemet proposed to endeavour to ascertain before the next meeting whether opium acts as a resin, or whether the active principle is due to the morphine or narcotine therein contained.

The PRESIDENT thanked M. Jacquemet for his interesting communication.

M. VIDAL described a piece of apparatus of his own invention [see page 102], for which he received the thanks of the Society.

The nomination of a Committee to report upon this apparatus was postponed to the next meeting, some of the parts not being at the time quite finished.

M. TERRIS described to the Society a sensitising bath which he used for albumenised paper. To a bath of nitrate of silver, 25 grains to the ounce, he added a certain quantity of nitrate of ammonia, which he alleged to preserve the albumen on the surface of the paper; and asserted that his toning was good even with so weak a bath as indicated, in proof of which he exhibited a series of beautifully-toned *cartes de visite*. M. Terris also exhibited a series of reproductions, which were much admired.

M. E. Loire also exhibited some well executed proofs.

Thanks were accorded to both of these gentlemen.

The ASSISTANT SECRETARY read the programme of an offer of a prize of 500 francs [see page 109], which was unanimously adopted.

M. VIDAL read a letter from MM. Mayer and Pierson, thanking the Society for its intervention relative to their process.

A letter to the Minister of State expressive of views in favour of property in photographic copyright was then read, which was unanimously approved.

Before closing the meeting M. VIDAL informed the members that he had been successful in finding a suitable place of meeting for the Society, in conjunction with all the other scientific societies in Marseilles, which would also be appropriated to a permanent exhibition of paintings and works of art, amongst which photographs would find a place.

After some congratulatory expressions and words of encouragement, which were cordially received, the meeting separated.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE members of this Association are informed that the next meeting will be held at Myddelton Hall, Islington, on Wednesday, the 19th inst., when officers for the ensuing year will be elected.

Attention is called to the following By-Laws:—

1. That the subscription of 10s. 6d. per annum being due on the 31st March, and payable in advance, should be paid to the Secretary before the 28th April next ensuing, and that the delivery of the Journal be discontinued to those members whose subscriptions are in arrear on that day; but on the payment of the same any time during the current year, the back numbers of the Journal shall be forwarded.

2. That a member elected at any time during the year be entitled to the numbers of the Journal from the 1st of April inclusive.

The Treasurer will be in attendance to receive subscriptions from those gentlemen who may be desirous of obtaining receipts on that evening.

JOHN BARNETT, Hon. Sec.,
37, Devonshire-street, Islington, N.

Scraps and Fragments.

M. D. VAN MONCKHOVEN'S MANUAL.—Arrangements have already been concluded for publishing this popular work in the Dutch and German languages, and we believe also in English, and negotiations are on foot for its appearance in a Russian dress.

USEFUL SUBSTITUTE FOR GROUND GLASS.—Many of our readers will be glad to learn that a varnish is now in the market by which the effect of *very finely ground* glass can be produced either upon simple plain glass or that on which stereographic pictures have been printed, by merely coating the plate with the varnish precisely in the same way as collodion is applied. The solvent of the material, left on the plate in a very finely divided state, is of a very volatile nature, and therefore little or no heat is requisite during its application, provided that the plate be perfectly dry. This varnish we saw at the establishment of Messrs. Horne and Thornthwaite, Newgate Street, London, a few days back, when accidentally calling in there; but we believe it is not of their manufacture though on sale by them.

FINE ARTS' COPYRIGHT.—The bill just introduced into Parliament for securing copyright during the life of the author and for seven years after his decease, in paintings, drawings, and PHOTOGRAPHS, imposes also certain penalties, viz:—1. Upon any person who shall *fraudulently* affix any name, initials, or monogram upon any work of fine art.—2. Who shall fraudulently offer for sale or exhibition any work of fine art having thereon the name, initials, or monogram of a person who did *not* execute the work.—3. Who shall fraudulently dispose of any copy or colourable imitation of any work of fine art as having been executed by the author of the original work.—4. Who, during the life of the author, shall, without his consent, offer for sale any work of his (which has been disposed of by him), or copy thereof, *altered by some other person, as the unaltered* work of the author. The copyright of any drawing or painting that has been sold to pass to the purchaser with the work, unless reserved to the author by express agreement in writing.

Foreign Correspondence.

Paris, March 11th, 1862.

THE judgment pronounced by the tribunal of the *Police Correctionnelle* in the affair of Mayer and Pierson is still occupying attention here. The Marseilles Society has just come to a decision which is, I think, the only right one in the present state of things, and which indeed I had myself suggested in the *Moniteur de la Photographie*. The Society has resolved to write to the Minister of State—who is the President of the Commission entrusted with the elaboration of a new law on artistic and literary property—to call his attention to photography. The following is the draft of the letter adopted at the meeting of the 28th ult.:—

"MONSIEUR LE MINISTRE,—As your Excellence is at present engaged upon the revision of our legislation on literary and artistic property, the Photographic Society of Marseilles has considered itself called upon to recommend to your favourable attention the interests of the art which they encourage. Without pretending to assimilate it with the arts of pure creation, it must be acknowledged that photography, while it is a useful and powerful auxiliary to those arts, does also itself demand a certain amount of research and artistic investigation. And yet, in the present state of things, men of taste and talent and study are liable to see greedy imitators snatch from them, almost with impunity, the fruit of long and painful labour, in which the intelligence has borne the larger part. Our jurisprudence, enchained by a legislation already of old date, and anterior to the discovery of photography, is unable to afford to the works in question the efficacious protection of penal repression. We trust, Monsieur le Ministre, that, thanks to your enlightened and equitable intervention, this unfortunate position may shortly be modified. It is therefore with full confidence that the Photographic Society of Marseilles expresses to your Excellence the desire that photography may be included by name in the new bill relative to literary and artistic property."

At the same meeting the Marseilles Society settled the programme of the prizes for the improvement of the dry collodion processes, of which I have already spoken. The idea is good, and it is desirable that other photographic societies should follow the example. In general experimentalists are rather disinterested, but the offer of prizes would certainly increase their emulation. I must add that for the Marseilles prizes foreigners will be admitted to compete as well as natives.

The initiative taken by the Provençal Society has already produced useful effects. At the last meeting M. Jacquemet made known the results of the researches which he has been making. Various experiments have led him to employ resins, which were first suggested some years ago by the Abbé Despratz, and which are at present coming more and more into notice again. M. Jacquemet has tried opium with collodion. That substance appears to him to act as do resins, with respect to the preservation of the sensitiveness. Some stereoscopic pictures exhibited by the experimenter, and obtained with a full light in from two to three seconds, show that, with collodion thus prepared, one can operate very rapidly and obtain images of remarkable delicacy.

M. Terris likewise communicated to the Marseilles Society a process for sensitising albumenised positive paper by means of a five per cent. silver bath containing a certain quantity of nitrate of ammonia. This salt enables the albumen to be maintained at the surface of the paper. The toning can be done very well notwithstanding the feebleness of the bath.

M. Léon Vidal presented to the same Society the model of an apparatus of which he is the inventor, and which he calls *autopolygraphic.**

Two very interesting trials will shortly take place. First, the appeal of MM. Mayer and Pierson from the judgment which has been so much talked of, and then the affair of photography with carbon between MM. Poitevin and Charavet. The curious part of the latter affair is that it is M. Charavet that has begun the attack, thus forestalling M. Poitevin, who on his side was preparing to prosecute. The issue does not appear to me to be doubtful.

One of the photographic novelties most in request at the present moment is the *carte de visite* portrait of Dumollard, the murderer of servant girls, who has just been executed. His wife, whose portrait has also been taken, is less in request. What gives a greater vogue to these pictures is the fact that the police have forbidden their sale in public, although it is permitted to cry about the street the various *complaintes* of which the atrocious wretch forms the subject.

ERNEST LACAN.

Philadelphia, February 23, 1862.

SINCE my last letter, a correspondence with the principal cities of the United States, with especial reference to the collection of information for you, has brought some return; and those to whom I have written, being enthusiastic, are willing and glad to furnish each their items of news, so that soon I shall be able to lay before your readers the exact condition of the art in the various sections of our country, and the peculiarities of the formulæ used.

The war, as was intimated in my former letter, has had a great influence on photography. At the commencement of the troubles with the South the trade in stereoscopic pictures was in a very flourishing condition; but the sale of this class of prints soon fell off, so as to render their manufacture for the market quite limited. As soon, however, as the first monetary crisis had passed, and people had begun again to invest some little of their spare funds in the *fine arts* (?) *cartes de visite* became all the rage, and stereographs were considered dead stock. At this juncture Mr. Langinheim, whose business had been principally in stereographs, was forced to look about for some new use for his camera, and, more as a joke than in earnest, he began to make magic lantern slides of war scenes. These were *all* copies of well-executed engravings, which had been touched-up previous to being photographed. The sale of these copies exceeded his most sanguine expectations, and now he has a large number of persons (mostly women) engaged colouring and mounting them ready for the lantern; whilst in almost every city and town are wonderful exhibitions of war scenes under the attractive name of "stereopticons." But the fun of the thing is that the innocent spectators for the most part imagine they are looking at photographic pictures "taken on the spot."

Speaking of copying brings to mind one fact in relation to photography worthy of note. In the infancy of any art or science too much is attempted by one individual; and the producers of portraits are called upon to copy drawings, photograph machinery, and do up on cardboard our country mansions. It is not surprising that they fail at some of these so different processes. But soon the wants of society warrant the subdivision of the art into separate and distinct departments, and now there are several well-conducted establishments especially for copying purposes. Three of these are at Washington, under Messrs. Mathiot, Walker, and Wood, who in the order named conduct the photographic department of the Coast Survey, Treasury Building Extension, and Capitol Extension. A very perfect specimen of copying lately produced is the restoration of one hundred lost pages to an old and rare edition of the Bible. The prints are on ammonio-nitrate plain paper, the sheets being silvered by immersion, and printed on both sides: it is the work of a Mr. Subert, of Philadelphia. Mr. A. H. Hemple, who has made copying a speciality, gives me the following as the process best suited to the purpose:—He uses a collodion made from bleached cotton, prepared at a high temperature in weak acids—the collodion sensitised with iodide of ammonium only, no bromide being used. Bath, fifty grains to the ounce, very acid with nitric acid. His exposure is very short, using a three-and-a-half Jamin view lens. He exposes a fourteen by eighteen-inch plate (the print being in the full glare of the sun) about thirty seconds, with an aperture of one-quarter of an inch. He develops with iron and clears with cyanide, then strengthens with bichloride of mercury and hydrosulphate of ammonia. This is essentially the same process as is recommended by Mr. C. Waldack, in his admirable treatise on photography.

By-the-by, this last-named gentleman writes from Cincinnatti that he expects soon to dispose of his establishment at that place, when he will visit Europe, where his interests require his presence, and where he hopes to have more time and opportunity to prosecute his studies. He gives a gloomy account of the condition of the art in the west, and says the only real progress is among amateurs. He sends the following as the formula of a good negative collodion:—"To sixteen ounces of alcohol add one hundred grains of iodide of potassium and fifty grains of bromide of potassium, previously dissolved in a very little water; then add sixteen ounces ether, and let it settle. Separate the clear part by means of a syphon, and add sixty grains of iodide of cadmium. If the liquid be a little milky the cadmium will clear it up. Why? is what I do not know. Finally add from two hundred to two hundred and sixty grains of cotton." I send the above as from a high authority—from one whose aim is to advance science.

Some of our "dry" amateurs are just now highly elated at the prospect of soon possessing the true "elixir of life," viz., an instantaneous dry process. Their hope is founded on Dr. Draper's process, made public at the last meeting of the American Photographical Society. His *modus operandi* is to use the ordinary tannin dry plates, which he soaks in very hot water *before developing*, and treats the hot plate with a cold pyrogallic developer. It is claimed that the exposure has been shortened to one-twentieth the usual exposure. Mr. Hull and others say that the same good effect is apparent when wet plates are so treated. About two years ago the writer of this worked for some time in very cold weather with two silver baths of the same strength, one moderately warm for sensitising, and the other very hot—say about 200°. Into the hot solution the plate was plunged after exposure, and then, while still hot, was treated with the ordinary cold iron solution. Good results were obtained, but no advantage sufficient to warrant the complication was made evident.

Canada will soon lose an enthusiastic patron of the arts in general, and photography in particular, in Mr. T. E. Blackwell, the Vice-President and Managing Director of the Grand Trunk Railway, who resigns his position on account of ill health. He will take home with him to England specimens of the work of a great many of our American photographers, and to his order many very fine pictures have been made of the works connected with the railway, also of Niagara; and Mr. Notman, of Montreal, made for him last year some good pictures of the great eclipse of the sun. In my next I hope to speak more precisely of what Dr. Smallwood, of Canada, has done in the micro-photography of snow flakes.

It is with pleasure we have seen a letter from Mr. L. Lomas, urging an exchange of prints between amateurs of England and America, which letter was published at length in *Humphrey's Journal*. It is proposed, in my letters to THE BRITISH JOURNAL OF PHOTOGRAPHY, to give the name and address of successful American amateurs who have consented to exchange print for print with any in England who may send them pictures; and as soon as the names and addresses of those similarly inclined in England are known, the initiative packages will start from this country (at least, if we ever have a glimpse of sunshine through the endless cloudy weather we have had of late). At present we have only the name of Mr. Michael Hannaford, of London, who shall soon hear from us. And now permit me to introduce to your readers Mr. James Hunter Blockly, P. O., Philadelphia, Pa., a gentleman of exquisite taste, and plenty of leisure for his experiments. His forest scenes will be particularly interesting. Fearing I have already intruded too much on your valuable space, I beg to add to the list of amateurs willing to exchange the name of

COLEMAN SELLERS.

* See page 102 in the present number.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

A LITTLE LESSON FOR A NAUGHTY LITTLE PHOTOGRAPHER.

To the EDITOR.

SIR,—Receiving my newly-arrived copy of the *American Journal of Photography*, and turning over the old friends which came upon me thick and fast in its pages, I paused to scan an article that I had not before seen, an extract from the *Photographic Notes*—the said extract being a curious critique, IN RHYME, upon "Euclid in the Stereoscope," signed "Lictor Caledoniensis." Now, if rugged old "Bell-the-cat" Douglas ever read anything like this critique in rhyme I can forgive him for saying—

"Thanks to St. Rengan! son of mine,
Save Gawain, ne'er could pen a line;"

for it is difficult to conceive anything more saddening to a parent's heart than the simple possibility of a son degrading himself by perpetrating such lines as these. In justice to the American editor I must add that he denounces the critique as "doggerel," and states that he merely inserts it "to make its subject" (or rather its excuse) "more prominent," just, I suppose, as the rotting carcasses of gibbeted felons used to make prominent the beauty of justice in olden time. The critique has, perhaps, some three or four lines in praise of the stereoscopic slides which give it a title; and all the remaining—for it is a somewhat long affair—are devoted to a malice-venomed attack upon THE BRITISH JOURNAL OF PHOTOGRAPHY, its editor, and its staff of writers—vulgar adjectives and coarse personalities forming its sole magazine of war. Falstaff threatened Prince Hal, saying—

"I'll have ballads made on thee, and sung to scurvy rhymes."

And as precisely the same threat is used in the article cited, you may easily imagine that my teeth and knees are rattling against each other, like so many pairs of nigger castenets, at the bare prospect of my terrible position, just as, doubtless, stout Prince Hal's did.

Having puzzled myself with conjectures as to the probable author of such a precious production I have arrived at the conclusion that it is no less celebrated an individual than he of the "cabbage laurels"—he of mighty repute—the gifted bard of the glorious Moses! Henceforth not Moses's alone—the *Notes*' only contributor and—scissors excepted—its misanthropical, toil-worn editor's only assistant—an

"*Hibernian* bard of deathless fame,
Known by his wond'rous patron's name."

I am well aware that for years past you have abstained from taking any notice of attacks from this quarter directed against yourself, but that is no reason why I, who am a pretty constant contributor to your pages, and have no part in the feelings of those who shrink from the infliction of well-merited chastisement, or imagine there is a great accession of dignity in assuming the self-complacent armour of self-asserted superiority or assumed invulnerability to certain attacks, should be equally forbearing, and, unless you purpose taking up the cudgels in my defence, I make an earnest request that you will grant me space for the insertion of this protest, a request that I do not think you can in justice refuse, seeing that, as one of your staff, I come in for a very unmerited share of abuse.

There are, unfortunately, dirty little boys whose elements of happiness lie in the mud and filth of the kennel, who make themselves in a terrible mess, and are apt to annoy the more cleanly and respectable passengers by throwing dirt about. This is wrong conduct, undoubtedly; but, having a meaning as foul as the act is in itself, can hardly be said to deserve pity. On the contrary, that naughty little fellow's best friend—even his dear mamma—would box his ears and scold him, and send him supperless to bed. And are there no dirty-little-boy journals, periodical pages soiled with worse than the kennel's foulness? Serials full of scurillity and personal abuse, which, out of very kindness, we ought to birch into cleanliness and respectability. Let those think of this who may feel inclined to question the policy of admitting such epistles as those of "Paul Pry," "Auld Lens," and others, into your columns. For years back your Jersey contemporary has been earning a most unenviable notoriety among its readers by the rabid intensity and spitefulness of its attacks upon this Journal. *Absit invidia*—why is this? In vain I try to find a cause; and, as a *dernier ressort*, I am compelled to seek it in the secret flattery implied by open envy. In sober truth there is nothing else to which it can be attributed. Flippant Mr. Sutton tells us he attacks this Journal because he dislikes, or, as he says, "condemns the incompetency of the Editor;" but, if this be the sole cause assignable, surely it must be a very humiliating confession for your Jersey contemporary to make. Because I condemn or dislike one certain Frenchman, shall I blacken his nation, and abuse his countrymen? I have seen a savage little animal in the nursery bite and kick at all his harmless innocent little brothers and sisters, because nurse wouldn't let the self-willed little rascal have his own naughty way; and it seems to me that this wicked little boy professes to bite and kick such of his photographic brethren as may chance to be engaged on the staff of this Journal with the same evil little feelings, because *he* can't have his own way.

When Plato spoke of the slanders used against him by his foes, he said, calmly, "My life shall be such that no one shall believe them," although he well knew that the rhinoceros hides of these bitter enemies were proof against such living evidence, and that his very uprightness of life itself originated their enmity. So with this jealous-pated, foolish, little Jersey jangler: the thickness of his hide and the origin of his enmity being known, you may regard the poor little fellow's overflowing evil passions simply as the barometer of your own increasing success and good repute. It is, therefore, only in pure pity that I now venture (for perhaps the last time) to give this unruly little fellow the following advice.

So come here, Master Tommy. Now, ain't you ashamed to appear before me in such a filthy pinafore?—don't cry, and don't screw your dirty knuckles into your eyes—don't, sir!—it's all for your good! Why can't you be a good clean little boy, and make your pretty little toy-inventions, and your funny little sayings, and your really useful panoramic lenses, and your other praiseworthy small discoveries, without dirtying yourself and your Jersey pinafore by raking up dirt from mud-pools and sewer-kennels, and seeking such low companions as the poets-of-the-puff-palpable employed by Jew slop-sellers. As to your complaints against "Paul Pry" and "Auld Lens"—of whom you appear so unforgetful, and against whom you seem so rampant—well, if they did laugh at you, and quote some of your funny sayings to make others laugh also, don't you know that people always do laugh when they see the spiteful and malignant allied to the puny and the impotent. If you think yourself so much wiser than our friend the Editor, is that any reason why you should be contemptuous of him, unless you think, *as may-be others do also*, that any one with less wisdom than *you* possess must be contemptible indeed; but if—whatever the known or secret reason for your malice and ill feeling—you will persist in disliking and abusing him, pray is that any reason why you should extend such feelings to the Journal he edits, and all the writers in its pages, and call them, as you do in your puff-poet's recent rhyming critique, "elderly ladies," writing "unmitigated trash," with a "silly style," while "in crazy conclave rudely screeching?" Don't you know that wildness of diction and malice defeats its own purpose by appearing childish and ridiculous, just as tearing a stage passion to tatters generates more laughter than horror among sensible spectators? In conclusion, the best advice I can offer you is that given by Epictetus—who says, "If any one speak ill of thee, consider whether he has truth on his side; and if so, reform thyself, that his censures may not affect thee."

And now, master Tommy, you may go, and I hope the little lesson you have just received will produce a proper effect by making you henceforth a more cleanly, respectable, and better-behaved boy. There, go along, and think about what I have said, until you are prepared to thank for an improved and contrite spirit "Paul Pry," "Auld Lens," and

ONE OF THE CALUMNIATED "STAFF."

PIN-HOLES IN THE NEGATIVE.

To the EDITOR.

SIR,—I have been very successful in the collodio-albumen process during the past season, some of my negatives being perfect. My plates have given me equally good pictures from June last to the end of November, although sensitised on the 7th of the former month; and I have now some of the plates prepared on that day which I am keeping to find out how long they will keep good. These keeping qualities are invaluable to an amateur; but there is one defect I am troubled with in some, I may say in many, of the plates, and that is a vast number of pin-holes in the skies, or wherever else the film has been strongly acted upon by the

light. Some have told me that I have not filtered the developing solutions sufficiently: this I have tried without success. Some say these pin-holes are occasioned by dust; but I think this hardly possible as they are so numerous and close together. Many acknowledge that the cause has not been discovered. I thought it might have been occasioned by the water, so I tried the final washing in distilled water, rain water, &c., but there was no difference.

I have observed the same thing with some collodions in the wet process, and have attributed it to the iodising solution being too strong.

I should be very much obliged to you to enlighten me on the subject, and tell me the cause and the remedy.—I am, yours, &c.,

March 3rd, 1862. COLLODIO-ALBUMEN.

[It would not be philosophical to attribute pin-holes in the negative to any universal cause: they arise from different ones at different times. Your nitrate of silver bath may contain minute particles of oxide of silver diffused therein: this would account for the holes. Your use of distilled water for the *final* washing is not enough, if the cause be in small particles of chloride of silver, which would be formed during the *first* washing: filtration of the developer is no doubt a good precaution, but this is of very little use unless you have made your developing solution with *distilled water*, a very important precaution frequently overlooked. And lastly, in adding solution of nitrate of silver to the developer, you should *not* take a portion of the sensitising bath for the purpose, as that contains in solution iodide of silver, which becomes precipitated under the action of developing the picture in fine particles over the plate, almost immediately on being poured on it. You should keep an unused solution of nitrate of silver specially for the purpose of adding to the developer.—Ed.]

CHEMICAL PROBLEMS IN CONNEXION WITH ALBUMEN

To the Editor.

Sir,—Will you allow a neighbour of "Q. R." to ventilate in your Journa' the question of the proportions of salt and albumen, as given in page 53 and 97. I am as perfectly convinced as you are "that in any formul› for a *photographic purpose*, by *albumen*, simple white of egg is intended to be implied," and moreover, that in albumenised paper, when the water is evaporated by drying, the white of egg merely becomes solid by this evaporation, and this dry white of egg retains the same impurities it had before, with the sole exception of the water which was one of its constituents; and thus "solid albumen" or "dried albumen" is not *pure* albumen, but simply *dried white of egg*. You are therefore in error by "assuming that 'Q. R.' wants to obtain on the paper one part of a chloride to three of *pure albumen*," unless you consider dry white of egg to be such. The word "*pure*" has never been used by him: he simply wants the albumen as it exists upon the dried paper to be as three to one of the *added* chloride. You proceed to say:—"You must needs first analyse the white of egg to ascertain how much chloride it naturally contains, as this is variable in quantity."

Mulder's analysis of white of egg gives the following constituents, with their proportions for 100 parts:—Carbon, 53.5; hydrogen, 7; nitrogen, 15·5; oxygen, 22; sulphur, 1·6; and phosphorous 0·4. Where, then, is any "chloride it *naturally* contains" to come from—all these constituents being elements? But *assuming* that more recent analysis has proved Mulder to be incorrect, and that white of egg contains even a large portion of a chloride, comparatively but few persons are acquainted with the fact, and therefore, in writing to obtain information respecting the quantity of salt to add to the albumen, they simply mean how much must they themselves put in to give the requisite proportions, without any reference to the *constituents* of white of egg.

The quantity of salt you give is 160 grains to the ounce of white of egg, viz., 1 to 3; but the whole of the water in the albumenised solution, whether *existing* in the white of egg, or *added for dilution*, will be evaporated upon drying the paper, which paper will then be coated with a mixture of dried white of egg and salt. Let us, for the sake of argument, say that *one-half* of the white of egg is water: an ounce, upon evaporation, will leave half-an-ounce of dried white of egg upon the paper, but the *salt* contained in the other half, viz., in the water, will not be evaporated, and thus, remaining on the paper, will, in conjunction with that in the dried white of egg, make the proportions 160 grains to the *half-ounce*—that is, one of salt to *one and a-half of albumen*. Are you therefore correct in saying "our original reply would meet your requirements," when that was one of salt to *three* of albumen? Stockhardt says, in speaking of white of egg:—"On evaporation we obtain from it one-eighth of solid albumen; the rest is water." Where is this large proportion of water to come from, if Mulder's analysis be correct?—as he gives only 7 parts hydrogen and 22 oxygen, making together but 29 parts out of 100, and these are in such proportions as to constitute but very *little* water.

The Abbé Pujo, *On Positive Printing upon Albumenised Paper*, says:—"Under ordinary conditions five cubic centimetres of albumen solution contain nine grains of pure albumen." What does he mean by *pure* albumen? Does he mean simply the white of egg deprived by evaporation of the water which enters into its composition, and therefore *dried albumen?*

How much dried or solid albumen is left upon evaporating white of egg? Stockhardt says "one-eighth." If the Abbé Pujo means by *pure* albumen the white of egg dried by evaporating its water (and in no other way does it remain on albumenised photographic paper), 9 grains left out of 5 cubic centimetres is not so much as *one-ninth*. The question as to the proportion which *dried* albumen bears to the white of egg in its normal state is of much importance, as upon it depends the proportions which the albuminate, chloride, and nitrate of silver will bear to each other in a given strength of sensitising solution.

One ounce of albumen (white of egg)=480 minims, will, according to Stockhardt, leave 60 minims of *dried* albumen upon evaporation; and to have this in the proportion of 3 to 1 of salt, 20 grains of salt must be added to each ounce of white of egg, irrespective of the quantity of water with which it may be chosen to dilute it.—I am, yours, &c., G. S. T. P.

4th March, 1862.

[We are most happy to give an opportunity of discussing this or any other question of interest to our readers, in evidence of which we insert your communication; but if you admit that, for photographic purposes, simple white of egg is meant by "albumen," we cannot perceive how you can question the accuracy of our reply to "Q. R.'s" query 3, at p. 53. If he meant simply dried albumen, certainly nothing in his communication would lead a reader to infer that.

In quoting Mulder's analysis, do you not substitute the words "white of egg" for "albumen?" Unquestionably the whole of the constituents of the water contained in white of egg are omitted in the result quoted, which applies only to the albumen without water.

If you take *dried white of egg*, break it up into very small particles, and treat it with *pure distilled water:* you will dissolve out a portion of chloride of sodium, besides some other salts. We believe the quantity to be variable, as also that of the water in the original animal production; consequently we do not perceive any discrepancy between the assertions of Stockhardt and the Abbé Pujo.

We are of opinion that if you will evaporate to dryness given quantities of white of egg at different periods of the year, or taken from different sources, you will *not* find the dried residuum bear a constant proportion to the original bulk.—Ed.]

KEEPING QUALITIES OF TANNIN PLATES.

To the Editor.

Sir,—Perhaps testimony as to the keeping qualities of tannin plates may be interesting to some of your readers.

I prepared some 11 × 9 and 8½ × 6½ dry plates by the tannin process last May, and, as I did but little photography in the summer, they were not exposed until October, when they proved perfectly good, and produced negatives as clean and uniform as any wet collodion. I have one or two of them unexposed now; and on the 20th of last month I took an interior of a church on one which, being under-exposed, stood four hours' development without a sign of stains. They have been kept in a by no means dry place all the winter. I used a five-grain solution of gelatine as a preliminary coating, and a fifteen-grain solution of tannin. I believe success to depend in a great measure upon soaking the plates a long time in water: that will throw down a precipitate with nitrate of silver before the tannin is applied. I use a deep wooden trough, with a rack to carry eighteen 11 × 9 plates, to lift in and out. This is filled with *pump* water, and the plates immersed and coated with tannin at leisure. A little slate cistern would be a better thing.

I have seen inquiries for a substitute for ground-glass in your Journal. I have obtained a beautiful fine coating by mixing some iodised collodion with Horne and Thornthwaite's benzole crystal varnish, and coating a plate with it in the same way as collodion. I have used no other focussing screen for a long time.—I am, yours, &c., T. W. V.

TANNING.

To the Editor.

Sir,—In the interesting correspondence published in your last number, relative to the early history of photography, there is one phrase employed by the Rev. J. B. Reade that I presume ought to be read in a figurative instead of a literal sense. When the lady objected (very naturally) to supply a second pair of kid gloves for her husband to destroy, in what she very likely considered his nasty experiments, he states that he exclaimed—"Then I will tan paper." I cannot understand how it is *possible* to tan paper. Perhaps, if I am in error, you will have the kindness to correct me, and oblige yours, truly,

Braintree. CHARLES TYRREL.

[Probably a figurative expression was what the rev. gentleman meant to employ; but there was in it more that was literal than at first might be supposed. In the photographic dark ages we did not indulge in the luxury of foreign papers, and one of the favourite kinds was a species of thin drawing paper made by Whatman and Co. But although it was thin for a drawing paper, it was a very thick paper, as we should now consider it, for photographic printing, and bore much the same relation to some of the finer kinds now in use that a blanket does to a piece of cambric. Now this paper was sized with some kind of gelatine, enough being contained in a sheet to mount one or two photographs, as any one may prove by extracting the size from some of it by means of hot water; and if we regard the sizing material as an essential part of the paper, which assuredly it is, then it is no figure of speech to assert that we may *tan* the paper by the addition of tincture of galls, seeing that the latter will certainly thus act upon gelatine.—Ed.]

ALCOHOL IN THE PAPER SENSITISING BATH.

To the EDITOR.

SIR,—I see a printing process given by your American correspondent as a new discovery, in which an ammonio-nitrate of silver bath is used with the addition of ether to coagulate the albumen of the paper.

This process was known to myself and friends about six years ago, and was abandoned almost as soon as proposed. *Alcohol* was used instead of ether, but of course the principle is the same.

The paper decomposed with great rapidity after excitation, and some prints an amateur friend of mine has now in his portfolio, taken some years ago by this method, have all faded bodily. I should therefore recommend great caution in the adoption of this and similar printing processes.—I am, yours, &c., LYNDON SMITH.

Leeds, March 7th, 1862.

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—From your last report of the meeting of the North London Photographic Society I see that Mr. Ross considered it necessary to tell the members that the field covered by a photographic lens is *circular*. I have frequently observed that you also, in your notices to correspondents, have had to explain this fact to your readers. Now, it might save you and such correspondents much trouble in future if, in cases of a similar nature, they would apply the simple principle called that of "sufficient reason." It may be taken for granted that nothing happens without a sufficient reason; and, as a lens is symmetrical with respect to vertical, horizontal, and all other directions whatever, *there is no reason* why the picture produced by it should be larger in one direction than in another, and therefore, by the above principle, *it will not be so;* hence the dimensions being the same in every direction, the picture is *circular*. The application of this simple principle in many cases would lead to this conclusion. There is no "sufficient reason" why Mr. Shadbolt should be so frequently bored by trivial questions, or that the valuable time of a man like Mr. Ross should be spent in explaining what a moment's consideration would make clear to a person of the slightest *nous*.

Mr. Ross also made some remarks on the pictures recently taken by Mr. Wilson with Dallmeyer's triplet. From what he said I infer that it is his opinion that a single combination would give as large an angle of field. He did not say this directly; but yet it seems to me that he wished this conclusion to be inferred. Let us look into the matter. The pictures taken are 7½ by 4½. The diameter of the very least circle from which they can be cut is, therefore, $\sqrt{(7.5)^2 + (4.5)^2}$, or 8·7 inches, *i.e.*, nearly 8¾ inches. But further: Mr. Dallmeyer showed me, a few days ago, a picture as nearly as I can remember eight inches square taken by this lens so that the circle from which it was cut must have been *eleven inches* in diameter. *The picture did not show the slightest indistinctness at the corners.*

I think that *no single lens* can be produced in which the diameter of the field covered will bear to the focal length of lens used the ratio of eleven to seven.

A friend of mine, who is using Mr. Dallmeyer's new stereo. lens of 4$\frac{4}{10}$ focal length, tells me that it will cover a five-by-four plate *very well*. Will any single lens do this?—I am, yours, &c., D. HORNBY.

[We must remind our correspondent that there are comparatively but few persons who possess a knowledge of the data upon which he expects them to exercise their reasoning faculties. With regard to the foci above quoted we believe him to be in error, and that he has probably reckoned the distance of the plate from the posterior lens.—ED.]

ANSWERS TO CORRESPONDENTS.

L. B. A.—Two or three minutes as a rule.

DEMOSTHENES.—The idea has already been carried out.

EXPECTANT.—M. van Monckhoven's work will appear in English shortly.

ARABIAN.—You will find what you require in the July number of our last volume.

GREEN.—We should say *very*—to be taken in by such a transparent falsehood!

J. T. S.—You will find all the information you desire in another column, in the report of the trial.

ROBERT CECIL.—Send your inquiries and we will help you, if we can. No need to forward the negatives: proofs from them will do quite as well.

F. A.—We have no reason whatever to doubt the truth of any of the statements made in the correspondence to which you refer. See note at conclusion.

H. R. R.—There is no comparison between the names you quote that is worth a moment's consideration. S. B. and B. by all means, for both stand and objectives.

NOVUM.—We must decline the notice for which you ask, on the ground that it would be too uncomplimentary to be of any service to you. Persevere and you may deserve one on a future occasion.

J. A. LAURIE.—You will find full information relative to the preparation of peroxalate of iron, as used by Mr. Reynolds, in this number, upon unquestionable authority— that gentleman's own.

P. A.—You had better sell the camera you now have and procure one to suit your purpose: an alteration will not be anything but a make-shift after all. Apply to Mr. Morley, of Islington Green.

CHAS. COWELL.—You are quite right in your statement that the name even of the reverend gentleman is unknown to many photographers: that is the very reason we have endeavoured to rectify the injustice.

MANDEVILLE.—1. See the report of the meeting of the Photographic Society. 2. Of the English kinds we prefer Hollingworth's. 3. Yellow, in preference to green, by all means.

SAMUEL.—We cannot undertake to test a lens for you: our time is much too valuable for such an occupation. If you purchase it from the maker you name you may rely upon its being what it is represented to be.

F. M. B.—1. Do not be too much in a hurry: remember that you have as yet heard but one side of the question.—2. He his absent from this country at present, but is expected back before the middle of the summer.—3. He has quite abandoned the art.

C. D. M.—With every desire to assist we cannot give private replies—our work would never be ended: as it is we are always writing. Send your inquiries in such a form as we can reply to through the Journal, and we will do our best to help you.

WILLIAM CLOWSE.—We regret the necessity at present existing for the use of albumenised paper—the shadows upon plain paper appearing in general too opaque for artistic effect. If we could realise the acquisition of glazed shadows and plain lights, we should have advanced a material step in the right direction.

N. S. (Belper.)—1. The same method of development will do very well for Fothergill plates: it is not needful to substitute acetic for the citric acid.—2. We did mean the kind you indicate.—3. Your writing is a little obscure, so that we are unable to make out the adjective applied to the word *camera*, consequently we are not in a condition to reply to this query.

SOMERSET.—Mr. Wenham is a scientific amateur, and makes no apparatus for sale. We regard Woodward's camera as a blunder in many of its details: see Journal for 1858. You require no special apparatus for enlarging beyond what you can make yourself if you understand the principle; and, if not, you would scarcely be able to use any apparatus that might be made for you.

S. C.—We like fair play and freedom of speech as well as any—much better than some; but we see no reason why the first may not be obtained without the abuse of freedom which degenerates into licentiousness. We cannot admit your note in its present form. If you are content that we shall eliminate all the personalities and imputations of base motives, we will insert your note; but *not otherwise*.

NOVICE.—The reason why cyanide of potassium is preferred for fixing positives on glass is, not that it requires less washing then hyposulphite of soda, but that the silver deposit which forms the *lights* of the picture is left of a much whiter colour than when the last-named solvent is employed to remove the iodide of silver. Cyanide of potassium acts strongly upon organic matter; hence it is not so applicable for fixing negatives which are developed by pyrogallic acid, the intensity of the deposit being materially weakened thereby.

L. A.—The Amateur Photographic Association is not a society for meeting and discussing questions connected with the art, but is rather an *exchange club* on a large scale, with some additional advantages. It is not intended to interfere with any of the existing societies: it offers no advantages which they do, while it fills a gap left vacant by them. So far from being antagonistic it is, on the contrary, supplementary. Write to Mr. Melhuish, 26, Haymarket, London, and he will forward you a prospectus if you desire it.

S. J. (Belfast.)— First-rate glass positives are really quite as difficult to take as good negatives: some think more so. There is not much absence of half-tone in the specimen received, but certainly a want of vigour. The fault is probably chiefly in the collodion, and partly in the bath. You had better try a collodion that gives a *creamy* film when excited: one that is *opaline* in appearance has not enough iodising solution for your purpose. Your bath also is most likely *too acid* with nitric acid for negatives. There is an excellent little *manual* lately published by Mr. C. Jabez Hughes, which costs but a trifle, and we would advise you to procure it. If you have any difficulty in procuring a suitable collodion, add about one grain more gun cotton to each ounce of what you are now using, also one grain more of iodide of ammonium *or* cadmium to the same quantity.

T. W. V.—We should recommend you *not* to *change* the lens you now have: you may get as good but not a better one for *landscapes*. For interiors and for copying pictures, that you have indicated by B will suit you best probably; but a good portrait combination, with a diaphragm between the lenses, will also answer the purpose. We have often stated (what we now repeat) that there is no lens in existence which is best, or even equally good, for all purposes; so that instead of changing your lens perhaps you had better get one in addition. For general purposes we prefer that which you designate by C; but it possesses the same defect for architecture and copying as the lens you have. That you call A has a similar fault, but in the *opposite* direction; it is, however, very portable, and is very useful for external architecture where you are too close for your convenience to your subject. Your choice should therefore be between A and B if you retain your present lens also.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, HENRY GREENWOOD, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 163, Vol. IX.—APRIL 1, 1862.

What a Lens will Cover.—At the February meeting of the North London Photographic Association a discussion arose relative to the angular amount of subject capable of being included by lenses of various forms; and, as it is a subject that appears to mystify the majority of our photographic brethren very considerably, we propose making an endeavour to throw a little light on the same. Some time back, in reply to one of our correspondents, we made an attempt to elucidate the matter by aid of a diagram (see Vol. VIII. p. 39), and at the meeting to which we have above referred Mr. Ross pointed out some of the bearings of the question; but, from inquiries since received, we find that by many the matter is still not understood.

In our last issue we published a communication from Mr. D. Hornby (current vol., p. 120), elicited in consequence of the discussion at the North London Society, to which we added a note to the effect that we believed he had been misinformed relative to the *equivalent focus* of the lens, which he assumed covered a much larger area than a single combination of equal focal length. Mr. Hornby in his communication draws attention to the fact that, though Mr. Ross did not actually assert as much, he left it to be inferred that a single combination would cover as large a field in proportion to its focal length as the triplet manufactured by Mr. Dallmeyer. We do not doubt that Mr. Ross did intend such a conclusion to be drawn; but, whether this be so or not, *we* are prepared to make the assertion that such is really the case. In consequence of Mr. Hornby's letter we have been induced to make certain investigations and calculations, which we propose to lay before our readers in order to try and set this one point at rest if possible.

We may premise, however, that we entertain a very high estimate of the skill, as practical and theoretical opticians, of both Mr. Dallmeyer and Mr. Thomas Ross, not deeming either of them to be superior to the other, though perhaps preferring the lenses made by the one for certain purposes, and those by the other for other purposes. Each have their own special merits; but, as we have long contended, no lens is or can be the best for all kinds of work. It is not therefore a question between the makers, but between the several forms of lenses which they usually supply.

From the note appended to Mr. Hornby's letter it will have been observed that we dissented from the conclusion at which he had arrived, and our reason for such dissent we indicated presumptively—that is to say, we believed an error to have been committed in the estimate of the *equivalent focal length* of the lens quoted. It has been chiefly to the verification of this point that our inquiry has been addressed. How far we were correct in our conjectures we will endeavour to point out.

In order to ascertain the *equivalent* focus of a combination of lenses, the simplest method of accomplishing it is to compare the size of the image of an appropriate object formed by the compound lens, with that formed by an ordinary spectacle lens not widely differing in focus from the former. And, first, we proceed to ascertain the principal focus of the latter, which is a very simple affair, thus:—Take any convenient object, such as a small engraving or a page of clearly-printed letterpress, fastened against a flat surface. Mount the spectacle lens in any way so as to adapt it to a camera, then draw out the body of the camera and adjust the object until a sharp image of the latter, of exactly the same dimensions as the original, is formed on the ground-glass. The distance between the lens and the object on one side should be exactly equal to that between the lens and the ground-glass on the other if the operation has been correctly performed, and the half of this distance (that is between the lens and object) is the principal focal length of the spectacle lens in question. Another method is as follows:—Remove the eye-piece and erecting lenses of a small telescope, and examine therewith some fine lines or printed characters, as if using a microscope. Measure accurately the distance between the lower lens and the object: to this distance, when ascertained, add that from the shoulder of the screw on the tube-mounting to the surface of the lens, and then this total is to be measured from the shoulder of the screw when replaced in the tube, and a *mark* made on the *outside of the tube*, so as to show where the image of the object-glass must be formed in order to be viewed by the eye-piece of the telescope. If the telescope be now adjusted upon a distant object so as to show it distinctly—taking especial care to have the upper draw-tube drawn out to its extreme limit, and making the adjustment by one of the lower joints—the distance between the mark on the tube and the centre of the object lens will give the principal focal length of the latter nearly enough for all practical purposes. Now, by substituting for the objective belonging to the telescope an ordinary spectacle lens, the length of the principal focus of the latter can be very closely ascertained. In this last-described way we proceeded in our examination, and found the spectacle lens we employed to be 8¼ inches focus, or, expressing it decimally, 8·25 inches. Mounting the lens thus tested in a temporary manner to adapt it to the camera, we selected two upright objects—the white edges of two windows in a house—and on attempting to focus them on the ground-glass with the whole aperture of the spectacle lens, the definition was so unsatisfactory that we reduced the aperture to about three-eighths of an inch, when a fairly distinct image was formed. The places occupied by the edges of the window were marked upon the ground-glass with a pencil, and on measuring accurately their distance apart, it was found to be 4·6 inches (4⅗). The single lens was then removed from the camera and replaced by one of Mr. Dallmeyer's triplets (No. 2685), which we had borrowed. The distance between the back lens and the ground-glass when we had focussed the same object as before, without moving the camera from the spot which it had occupied in the previous experiment, proved to be 7·25 inches (7¼); but the distance between the same window edges, marked as before in pencil on the ground-glass, was on trial found to be extended to 4·95 inches (4⅞), therefore (the equivalent focal lengths of lenses

being in direct proportion to the diameters of the images formed by each) it is clear that the triplet possessed an equivalent focus greater than that of the single uncorrected lens. How much greater is ascertained by the proportion 4·6 : 8·25 :: 4·95 : 8·87; consequently the focus of the triplet is equivalent to $8\cdot\frac{87}{100}$ inches—that is, upwards of $8\frac{3}{4}$ inches. Now, although Mr. Hornby does not say so directly (to repeat his own phrase), *he wishes it to be inferred* that the lens of which he wrote was only *seven inches* equivalent focus. We have no doubt that he wrote in perfect good faith; but, as his letter is liable (unintentionally no doubt) to mislead, we feel bound to correct such errors as we believe to have been made. This brings us to another source of probable misapprehension.

Mr. Hornby alludes to a picture that was shown to him, eight inches square, sharp up to the corner, taken with the lens of seven inches ($8\frac{3}{4}$ inches) focus; but he does not describe the character of the picture—that is to say, whether it was a landscape or a reproduction. As we cannot doubt the fact asserted to have been observed, we come to the conclusion that the picture was a reproduction, probably of a map or engraving, and that it bore some considerable proportion to the dimensions of the original. If this conjecture be correct, the explanation is simple enough. In order to obtain an image of the natural size the original must be brought to a distance of twice the principal focus from the lens, the conjugate focus being then a like distance behind the combination: the field covered will be increased in size to *four times the area or twice the diameter* of the normal field. Now the size of the field quoted might very easily be covered by a lens of $8\frac{3}{4}$ inches focus, even if the copy were only two-thirds of the dimensions of the original.

Although to the initiated it is easy enough to calculate from any given parallelogram that a lens is known to cover properly what limits of variation in the relative proportions of length and breadth are admissible (every circular lens covering a circular field), it would be as well to quote always the diameter of such field; and we have reason to believe that single combinations, if properly constructed, will cover *at least* as large a circular space upon a flat surface as any multiple combination that has hitherto been produced.

We have much more on this subject yet to discuss, but limits of space will not permit us to do so on this occasion. We will therefore conclude for the present with a practical suggestion that we consider worth attention. Most landscape photographers admire subjects that are nicely vignetted, an additional artistic value being usually imparted by this treatment. Again: considerable desire is frequently expressed to include more of a subject than is usually done with most lenses as at present used. Why, then, not take advantage of the fact that all photographic lenses cover a circular field, and thus accomplish to some extent both objects by the same means. *Let the plates be sufficiently large in their longest dimensions to include the whole circular diameter covered by the lens,* and when printing from the negative *vignette* the subject in more or less of an elliptical form: this would admit of oblong plates being used without inconvenience. Suppose, for instance, an operator is working upon ten by eight in. plates, for which he is using a fifteen in. focus lens: if he also carries with him a lens of only nine in. focus to replace the other upon occasion, and has an ellipse drawn in pencil upon his ground-glass screen, it will often happen that he can take a very charming subject as a whole, including a wide angle of picture, by arranging it for vignetting, when otherwise he would be constrained to include only a portion of it. Of course there will be some cases in which this mode of avoiding the difficulty will be inapplicable, but three times out of four it would be successful. We commend the idea to Mr. Wall: if he once tries it we shall probably be favoured with an article *On the Advantages of Vignetting a Landscape.*

Crystal Palace.—We are requested to mention that the Crystal Palace Company, being desirous of collecting photographs for exhibition during the ensuing summer months, has given permission to the South London Photographic Society to hold its contemplated Exhibition there. Those of our readers who are desirous of contributing thereto will find particulars of the regulations in our Report of the South London meeting, and any further information desired will no doubt be furnished by our friend, Mr. A. H. Wall, Hon. Secretary of the South London Photographic Society.

ON A NEW KIND OF PHOTOGRAPHIC DISH.

By D. Van Monckhoven.

Last summer I devoted my particular attention to the acquisition of large proofs from small negatives: the results of my investigations will be published in the course of the current year.

One of the chief difficulties with which I had to contend and to conquer was in connexion with the dishes. I operated with paper of 44 by 36 inches dimensions. I found it impossible to albumenise these sheets when dry; but, after having left them for a fortnight in a very damp cellar, the albumen took better, though still not in a satisfactory manner. There was also another difficulty with regard to the dishes. In fact with dishes having glass bottoms it is requisite to have the plates of glass and frames very thick, which cause the dishes to be excessively heavy, and in addition fragile. It is desirable therefore to find some other kind. Here then are dishes which cost scarcely anything, which can be used for baths of all kinds, and which can be carried with the greatest ease, being extremely light in weight.

For some years past there has been made, especially in England, a fabric coated with India-rubber, and which, besides costing only tenpence per square foot, is made light and completely impermeable. Neither the silver bath, nor cyanide of potassium, nor hyposulphite of soda will attack it or remove even the glaze. It is with this material that waterproof clothing is made. The cutting only is difficult; but, as it is wide and very long, it is possible with it to make enormous dishes, and this is *how* to do it:—Procure a board of the length and breadth of the desired dish, and attach to its edges, with hinges, sides of a breadth equal to the desired depth of the dish. These sides are held in position against the edges by means of hooks, so that they form a very light wooden dish, in which the waterproof cloth is placed, carrying it right over the edges of the wood, where it is retained by means of pins.

I believe that no one will find it an expensive dish when I say that one of about 39 inches square has not cost me more than eight shillings. I repeat also that it is not injured by any of the liquids employed for photographic purposes, and that it can be cleaned with the utmost facility.

ON BINOCULAR VISION AND THE STEREOSCOPE.*

By William B. Carpenter, M.D., F.R.S., &c. &c.

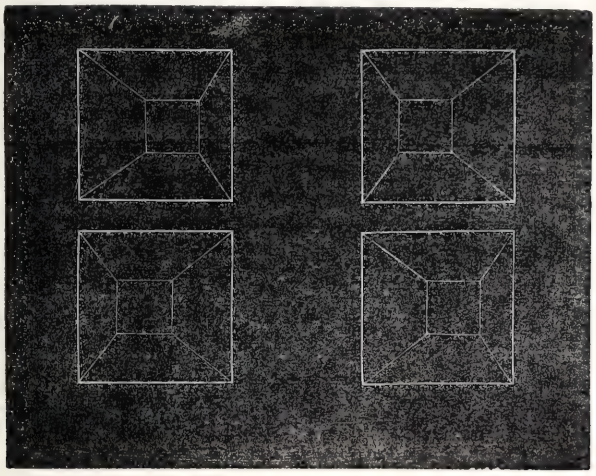
The first portion of this lecture was devoted to an exposition of the principles of binocular vision, which may be briefly summed up as follows:—

1. Objects are seen through *a single eye* with their proper outlines, colours, and lights and shades, but we have no *certain* appreciation of the *relative distances* of their different parts; and our notion of the *projection* or *solidity* of any object of three dimensions viewed through a single eye is the result of a mental interpretation of its aspect, as judged by the (virtually) flat picture formed of it on the retina.—In illustration of this position the lecturer directed the attention of his audience to a series of photographs of various works of art in *relievo*, which, when viewed with one eye in such a manner that the "mount" was cut off and nothing but the photograph was visible, impressed the mind with the assured conviction of solidity, no stereoscopic relief being more perfect. He also pointed out that the characters of particular surfaces come out much more strongly in this manner than they do when the photograph is viewed with both eyes jointly: thus the metallic lustre of a pair of bronze gates was made most unmistakeably apparent in one picture, and the glister of a pool of water on the sandy shore in another. Every single photograph, the lecturer remarked, should be looked at with one eye only, because it is essentially the representation of the object or scene as seen with one eye. When we use both eyes we are forced to recognise the flatness of the picture, and the illusion is destroyed.—A yet more remarkable proof of the

* A lecture delivered at the London Institution on March 19th, 1862.

want of power of the single eye to appreciate the true nature of solid forms was shown by the lecturer. The interior of a paper mask, painted like the exterior, was placed in such a manner as to be viewed with one eye only, the light being so thrown into it as to avoid shadow; and every one who thus looked at it was impressed with the belief that he saw the projecting exterior of the mask—this "conversion of relief" being the result of an erroneous *mental* interpretation of the (virtually) flat picture really seen.

2. The certainty of the appreciation which we form of the solidity of any near object of three dimensions, when we look at it with *both* eyes conjointly, essentially depends upon our receiving from it *two dissimilar images* with the two eyes respectively, and upon our *mental combination* of those images. This is proved by experiments precisely the converse of the preceding; for, if we draw two outline perspectives of any geometrical solid as it presents itself to each eye respectively, and then place these two dissimilar pictures in an instrument which shall throw their images upon the corresponding points of the two retinæ, so far is the dissimilarity of these pictures from being a source of confusion or embarrassment, that it forces on our minds the resultant perception of solidity which we do not derive from either outline separately. Thus, in the subjoined figure, the visual combination of the upper pair of perspectives gives the notion of a projecting truncated pyramid, with the small square in the centre of the larger one; whilst the combination of the same two perspectives reversed in position gives the perception of a hollow or receding pyramid. To the instrument by which this combination may be



most conveniently made, the name "Stereoscope" (seeing solid) was given by its inventor, Mr. Wheatstone. Two forms of this instrument are in general use:—the reflecting stereoscope of Mr. Wheatstone, and the lenticular stereoscope of Sir David Brewster. As the respective claims of these two eminent men of science in regard to this invention have lately been again brought under discussion, the lecturer thought it right to place before his audience the real facts of the case. [The notes and some parts of the text of what follows were omitted in the delivery of the lecture from want of time.]

Thus, then, in the invention of the Stereoscope, three separate stages may be distinguished; and I am anxious to fix your attention upon these, since your right estimation of the respective merits of the two principal claimants will depend upon your precise perception of what each has contributed to the general result:—

1st. The *recognition of the fact* that the images of any near object of three dimensions seen by the right and left eyes respectively are *sensibly different*, in virtue of the dissimilarity of the two retinal perspectives.

2nd. The *conception of the idea* that the dissimilarity of the retinal pictures of such an object, so far from being a cause of embarrassment, is actually the most certain source of our appreciation of its solidity or projection.

3rd. The *experimental verification* of that idea, by an instrumental contrivance for throwing on the two retinæ the two dissimilar perspectives of the solid, and causing them visually to coalesce, so as to impress the mind with the image of a single object in vivid relief.

Now it may be freely admitted that in the *first* of these positions there is no essential novelty. Every person of common observation is aware that the visual image of any near object of three dimensions sensibly varies with the position of his eye, so that by moving his head a few inches he obtains a view of it different from that which he had before; and hence every one who had either *thought* of the matter, or had made the simple *experiment* of looking at a projecting solid first with one eye then with the other, may have so far anticipated the invention of the stereoscope as to have recognised the dissimilarity of the two images so received. That recognition, however, seems for the most part to have had reference to the fact that more of *the right side* of a projecting object could be seen with the *right* eye, and more of the *left* side with the *left* eye. Thus I have been informed by portrait painters that they were quite aware of their being able to see further *round* the face with *both* eyes than they could with either *one;* and it was pointed out by Harris, nearly a century ago, that—"by the parallax, on account of the distance betwixt our eyes, we can distinguish, besides the front part, the two sides of a near object not thicker than the said distance, and this gives a visible *relievo* to such objects, which helps greatly to raise or detach them from the plane in which they lie: *thus the nose on the face is more remarkably raised by our seeing both sides of it at once.*"

Now this is the very nearest approach to the *second* principle that has been yet found in any of the older writers on vision; and to what does it actually amount? Really to nothing more than an imperfect recognition of the *first.* For you will observe that Harris makes no mention of the necessary dissimilarity of the retinal pictures of *every* near object of three dimensions, but merely states that by means of the parallax of the two eyes—that is, of the difference of their points of view—we are enabled by their conjoint use to see both sides of any object *not thicker than their distance;* and to objects of such thickness or breadth he expressly limits his statement.

Of the second idea, which constitutes the essential principle of the stereoscope, I unhesitatingly affirm that no real trace has yet been detected in the works of any writer on Optics or on Vision anterior to 1832. To Sir D. Brewster it was most assuredly quite unknown; as is evident, not only from the absence of the slightest hint of it in that part of his *Natural Magic* (1833) in which he treats of the curious phenomena I have described to you under the name of "conversions of relief," and in the section of his *Optics* (1831) in which he treats of binocular vision,* but also from the very high appreciation he at first expressed (as I shall presently show you) both of the novelty and ingenuity of Mr. Wheatstone's invention; and this not only on its first promulgation, but after having had ample time to look into the history of the subject. Of this second principle the earliest public enunciation is contained in the 3rd edition of Mr. Herbert Mayo's *Outlines of Human Physiology,* published in 1833. That author, who was at the time a colleague of Mr. Wheatstone, as a professor at King's College, in a short notice of Mr. W.'s experimental researches on binocular vision, describes the following (p. 288) as one of their most remarkable results:—"A solid object being so placed as to be regarded by both eyes, projects a different perspective figure on each retina: now if these two perspectives be actually copied on paper, and presented one to each eye, so as to fall on corresponding parts, the original solid figure will be apparently reproduced in such a manner that no effort of the imagination can make it appear as a representation on a plane surface."

In this extract we have the clearest evidence not only of the *distinct conception* of the essential principle of the stereoscope, but also of the *experimental verification* of it; and it has been admitted by Sir D. Brewster himself,† as proving that "Mr. Wheatstone was acquainted with the principle of the stereoscope in 1833," though it makes no mention of any instrumental method of combining the pictures. Mr. Wheatstone, however, has furnished the unimpeachable testimony of the late Mr. Murray‡ to the fact of his having completed his invention, both of the "reflecting" and of the "prismatic refracting" stereoscope in the year 1832. And I have myself seen a letter from Mr. Martin, the son of the painter of *Belshazzar's Feast,* in which he recalls to Mr. Wheatstone's recollection the fact of his having made drawings for his stereoscopes, when the instrument was first exhibited by Mr. Wheat-

* "Although an image of every visible object is formed on the retina of each eye, yet when the two eyes are capable of directing their axes to any given object, it always appears single. There is no doubt that, in one sense, we really see two objects, but these objects appear as one, in consequence of *the one occupying exactly the same place as the other.*" (*Op. Cit.*, p. 300). Sir D. Brewster could scarcely have written these last words if he had even thought of the *dissimilarity* of the two retinal pictures; far less if he had arrived at the faintest conception that in this dissimilarity lies the source of the binocular perception of solidity.

† See his letter in *The Times*, dated Oct. 22, 1856.

‡ The following letter from the late Mr. Murray (of the well-known firm of Murray and Heath) who was formerly assistant to Mr. Newman, the celebrated philosophical instrument maker, of Regent Street, was published by Mr. Wheatstone in *The Times*, in a letter dated October 29, 1856:—"From an examination of the accounts furnished to you by Mr. Newman, of Regent Street, during the time I was in his establishment, and which were prepared by myself, I am enabled to assign the date of my first knowledge of your stereoscopes, both with reflecting mirrors and refracting prisms, to the latter part of 1832."

stone in the private circle of his friends; and in which he states that from particular circumstances he is able to fix the date of this occurrence in the winter of 1832. Sir D. Brewster, who has admitted it to be obvious that Mr. Wheatstone did combine the pictures before 1833, and has further expressed his readiness to "place implicit confidence in Mr. Wheatstone's statement that he did it by means of the reflecting instrument," can hardly repudiate Mr. Wheatstone's assertion, backed by such independent testimony, as to the *completeness of the invention* of the "refracting" as well as of the "reflecting" stereoscope as far back as the year 1832; notwithstanding that it was not until 1838 that Mr. Wheatstone communicated to the Royal Society his first series of *Contributions to the Physiology of Vision*, in which the reflecting stereoscope was fully described and its principle investigated. That he should not have earlier found time to record his researches in the form he deemed best for their publication is not surprising, when we bear in mind that during this interval he was engaged not only in a great variety of the most important scientific inquiries, but in the prosecution of those labours which resulted in the Electric Telegraph. And it is also to be borne in mind that the photographic art was not at that time capable of furnishing for the stereoscope those marvellous pictures which now constitute its principal source of interest: so that, for several years after the invention of that instrument, its use was limited to mere outline diagrams of geometrical solids, and to such perspective representations of real or imaginary scenes as the comparatively imperfect labours of the draughtsman could furnish.

It will scarcely be credited by those who are only acquainted with Sir D. Brewster's later writings on this subject, that no one was more ready in the first instance to recognise the merits of Mr. Wheatstone's invention than Sir D. Brewster himself; for the stereoscope having been brought by Mr. Wheatstone before the physical section of the British Association, at its meeting in 1838, we find in the *Athenæum* of Sept. 8th the following statement of what passed on that occasion:—"Sir D. Brewster was afraid that the members could scarcely judge from the very brief and modest account given of this principle, and the instrument devised for illustrating it, by Professor Wheatstone, of its extreme beauty and generality. He considered it one of the most valuable optical papers which had ever been presented to the section." If any confirmation of his *then* opinion be needed, it is furnished by Sir John Herschel, who followed up Sir D. Brewster's commendation by characterising Mr. Wheatstone's discovery as "one of the most curious and beautiful for its simplicity in the entire range of experimental optics." The interest which was taken by Sir D. Brewster in the new line of inquiry thus opened up is evidenced by the memoirs on the subject which he successively communicated to the Royal Society of Edinburgh in 1843 and subsequent years. In these he discussed the theory of binocular vision, on the basis of his own previous doctrines, endeavouring to show that the phenomena of the stereoscope are to be explained by the *optical* rather than by the *mental* relations of the images; and he also pointed out various additional means of producing stereoscopic effects; but he did not *then*, even whilst controverting Mr. Wheatstone's theoretical conclusions, say a single word in disparagement of his claim, either to the discovery of the essential principle of the stereoscope, or to the invention of the instrument itself. In fact, it would be difficult to give stronger testimony in Mr. Wheatstone's favour than the following, spontaneously offered by Sir D. Brewster in his memoir of 1843:—"In prosecuting this subject, my attention has been particularly fixed upon the interesting paper of my distinguished friend Professor Wheatstone, 'On some remarkable and hitherto unobserved Phenomena of Binocular Vision.' *It is impossible to overestimate the importance of this paper, or to admire too highly the value and beauty of the leading discovery which it describes—namely, the perception of an object of three dimensions by the union of the two dissimilar pictures formed on the retinæ.*"

Among the various means devised by Sir David Brewster for the combination of the two perspective projections, one was selected by him as alike simple and easy in its construction, effective and convenient in its application—namely, the substitution for the mirrors of the reflecting stereoscope* of the two halves of a double convex lens, separated and turned back to back, so as to form two lenticular prisms: these form on the two eyes magnified images of the two pictures placed respectively before each, and, at the same time, bring these images into visual coalescence. An instrument constructed upon this plan for Sir D. Brewster, by the late Mr. Andrew Ross, was exhibited at the meeting of the British Association in 1849; but it did not attract at first much attention on the part either of scientific men or of manufacturing opticians, and Sir D. Brewster had to seek in Paris for an appreciation of his lenticular stereoscope which it failed to obtain in this country. He was fortunate enough to convince the eminent optician, M. Duboscq, of the practical value of his modification; and the instruments displayed by that maker in the International Exhibition of 1851, together with the beautiful photographic pictures which were shown by its means, excited an interest on the part of the public, which soon, as has been truly said, "warmed into a passion which has scarcely since cooled down." No one can be more ready than I am myself to recognise the obligation of the public to Sir D. Brewster for the vast amount of instruction and enjoyment which it has derived from those varied applications of his lenticular stereoscope, which the simultaneous development of the photographic art has made so familiar. But, in estimating the amount of that obligation, we must not lose sight of what is primarily due to Mr. Wheatstone; and it is with great regret that I have now to call your attention to the singular change which took place in Sir D. Brewster's appreciation of Mr. Wheatstone's merits and claims at the time when his own came into competition with them. The first announcement of this change was made in the *North British Review* for May, 1852, in an article of which the ostensible purpose was to exalt its author,* Sir D. Brewster, at the expense of Mr. Wheatstone; the assertion being then for the first time put forward that the essential principle of the stereoscope had been enunciated whole centuries previously by several writers on optics; so that (it was asserted) Mr. Wheatstone could claim no more than the merit of contriving a clumsy method of carrying that principle into operation, which had been completely superseded by the reviewer's own more simple, more convenient, and more effective instrument. The following is the opening paragraph of this article:—

"The history of science presents us with numerous cases where an important idea or an ingenious invention have long failed to attract the attention they have merited, and where the development of the one, and the improvement of the other, were requisite to bring them into public notice or practical use. An original idea may derive all its importance from the discovery of its useful application, and a rude instrument may be forgotten by all but its author, till a more fortunate inventor reproduces it under a new form, and with more valuable and extensive properties."

The reviewer then alludes to the history of the microscope and the telescope, and thus continues:—

"Like these valuable inventions, the stereoscope has had its infancy and its manhood. *At first a simple experiment exhibited with a rude and imperfect apparatus, it was soon forgotten;* and it was not till the discovery of its true theory and its valuable applications, and till the invention of new combinations by which these applications were to be effected, that it was brought into public notice, and made one of the most popular and interesting instruments which science has presented to the arts."

Now, so far was the original reflecting stereoscope of Mr. Wheatstone from being "a rude and imperfect apparatus," that, for the purposes of scientific investigation, as well as for the production of the finest stereoscopic effects, it remains unrivalled by the lenticular; and nothing but its want of portability and the comparative costliness of the large photographic pictures it is fitted to exhibit, prevent its superiority from being generally recognised. So far, again, was Mr. Wheatstone's invention from being "soon forgotten," that it has been specially noticed, and its importance fully appreciated, in every standard treatise on physiology I am acquainted with—English, French, or German,—and in nearly every work of authority upon physical optics, from 1840 to the present time, besides being exhibited and commented on to their classes by the best-informed teachers both of physiology and of physical science in every country. Further, Mr. Wheatstone himself was continuing his researches in the same direction; and in 1852 he communicated to the Royal Society a second series of researches on binocular vision, which, for their scientific merit, and for their important bearing on the most interesting questions of the psychology as well as the physiology of the visual sense (questions too recondite to be generally intelligible), leave Sir D.

* A refracting stereoscope with prisms had been constructed, as we have seen, by Mr. Wheatstone in 1832; and, according to Sir D. Brewster's own canon that "priority of publication is not priority of invention," Mr. Wheatstone is entitled to the full merit of having devised that arrangement, although he did not make it public until 1852. And I am assured by Mr. Malone, who executed the photographs sold by Mr. Newman for the reflecting stereoscope as far back as the year 1846, that there existed at that time in Mr. Newman's shop a refracting stereoscope of Mr. Wheatstone's construction, with a pair of lenses placed above it to magnify the pictures. Into the question whether or not Sir D. Brewster had or had not become acquainted with this instrument, I do not think it desirable to enter; since it mainly turns upon the nature of the private communications which passed between these two gentlemen, whilst still in friendly relation with each other.

* Although this article was anonymous, the subsequent incorporation of a large part of it into Sir D. Brewster's *Treatise on the Stereoscope* not only removes any doubt as to its authorship, which might have been suggested by its tone of self-laudation to those who are unacquainted with Sir D. Brewster's style, but fully justifies me in publicly attributing its authorship to him.

Brewster and his purely optical investigations far behind.* And I can assert, from my own knowledge, that the production of those stereoscopic photographs which have given quite a new value to the instrument had been accomplished, not only privately by Mr. Fox Talbot, on Mr. Wheatstone's suggestion, but by those who practised photography as a matter of business, some time before there is any evidence that Sir D. Brewster turned his attention to the matter. So much, then, for the extraordinary assertion that but for Sir D. Brewster the stereoscope would have been "soon forgotten."

I shall not detain you with examining at any length the assertions of Sir D. Brewster in regard to the approximations to the essential principle of the stereoscope which he affirms to be discernible in the works of previous writers. You may judge of the honesty of his representations by these two facts:—that he makes out from the words of Harris (which I just now read to you) that he had come to perceive as a general fact that "the *relievo* is produced by the combination of the two dissimilar pictures given by each [either] eye," whereas Harris says no such thing, but something essentially different; and that he asserts that Aguilonius was acquainted with the dependence of the appearance of solidity upon the dissimilarity of the pictures of the objects, when the fact is that the solids (τα στερεα) of which Aguilonius speaks are not actual solid objects, but the imaginary solids formed by lines drawn between the angles of the objects (which may be plane surfaces) and the eye. Aguilonius was puzzled by the dissimilarity of these στερεα when the object is placed nearer to one eye than to the other; and attributes the union of the two dissimilar pictures to a "common sense," without the slightest hint of the notion that in this union lies the essential cause of our perception of solidity.† It is not a little singular, moreover, that Aguilonius, like Euclid, Galen, Baptista Porta, Leonardi da Vinci, and other writers who discussed the subject of binocular vision, drew their illustrations from objects with *rounded* surfaces, such as spheres or cylindrical columns. These, it is obvious, are the *very last* objects they would have chosen if they had wished to draw attention to the dissimilarity of the perspective projections; since the retinal picture of any such object placed equally in front of both eyes will be *identical*, except as regards any shadows its surface may present.

Let me cite, with reference to these and other asserted anticipations of Mr. Wheatstone's discovery of the essential principle of stereoscopic vision, the following very true remark, long since made by a distinguished scientific man with regard to a beautiful invention of his own, of the merit of which he complained that others were attempting to deprive him:—"It has always been the fate of new inventions to have their origin referred to some remote period; and those who labour to enlarge the boundaries of science, or to multiply the means of improvement, are destined to learn, at a very early period of their career, that the desire of doing justice to the living is a much less powerful principle than that of being generous to the dead." You would scarcely anticipate from what has gone before that the invention to which these remarks apply was the Kaleidoscope, and that the inventor was Sir D. Brewster! Surely a scientific man who had himself suffered from the depreciation of which he thus complains, should be the last to practise it towards a brother philosopher whose discoveries he had at first so warmly appreciated.

Before quitting the subject of these asserted anticipations, I must draw your attention to certain statements recently put forth by Sir D. Brewster in regard to two drawings by an Italian artist of the sixteenth century named Chimenti, which are preserved in the Museum at Lille, and which were reported to Sir D. Brewster as being apparently right and left-hand pictures suitable for the stereoscope, and as producing an effect of relief when superposed by the convergence of the optic axes. On the strength of this report he publicly committed himself to the assertion that these pictures must have been drawn for the purpose, and that their existence distinctly proves the principle of the stereoscope to have been known to Chimenti; and, notwithstanding the published expression of a decided opinion on the part of the Photographic Society of France‡ that photographic copies of these drawings placed in the stereoscope do not present any true stereoscopic relief, Sir D. Brewster has reiterated that statement in the most positive manner a few weeks since, without having himself seen either the originals or photographic copies of them.* Since that time he has obtained such copies; and he now repeats as positive facts—first, that the pictures are truly stereoscopic; and, second, that they were drawn on stereoscopic principles; which I shall presently show you to be two very different propositions, having no necessary connexion.

You will yourselves have the opportunity of judging whether these pictures do or do not give a true effect of relief; for, by the kindness of Mr. Wheatstone, who has long had photographic copies of them in his possession, I am enabled to exhibit them in the stereoscope before you. In looking at them you will doubtless observe that *certain parts* do present the appearance of projection, and this is unquestionably owing to a dissimilarity of the two pictures. There is, in fact, no more delicate test of the dissimilarity of any two pictures than their stereoscopic comparison, which will show a difference of level in the conjoint image wherever there is the smallest departure from identity. Thus, as Prof. Dove, of Berlin, has pointed out, a difference may be detected between a genuine and a forged bank note, which the most careful ordinary comparison would not serve to distinguish; and it has been found to be difficult for a compositor to set up with the same type two lines consisting of the same words, with such exactness as not to show an inequality of level in the conjoint image when viewed stereoscopically. Now, I am authorised to state it as the opinion of several eminent artists, that one of the drawings in question is the work of the master and the other an inferior copy by a pupil; and I am assured by some of the most eminent portrait photographers of this metropolis that they are quite satisfied that these pictures were *not* drawn with any idea of giving stereoscopic relief. That these gentlemen do not wish their names to be drawn into the discussion, you will readily understand from a sample I shall presently give you of Sir D. Brewster's mode of dealing with antagonists who venture to dispute his *dicta*.†

But even if it were true, as Sir D. Brewster and *his friends* of the Photographic Society of Scotland assert, that these pictures when combined in the stereoscope give a true effect of relief, the assumption *that they were drawn to be so combined*, and that Chimenti was the "inventor of the ocular stereoscope," is altogether gratuitous. It seems to be altogether forgotten that, when the pupils of an Academy are set to draw from the living model or from a statue, any two of their drawings, done to the same scale, and from points of view ten or twelve degrees distant, will necessarily *pair* in the stereoscope, and will produce the effect of relief; and that multitudes of such drawings have been executed from the earliest period of art-study to the present time, without the smallest conception that such a use could be made of them. If a master and a pupil were making two such drawings from the same model, it would not be at all out of accordance with the practice of artists for the master to put his name to the drawing of the pupil, touched up (if necessary) by himself.

Having thus disposed of these asserted anticipators of Mr. Wheatstone from among the dead, I now turn to the claimants set up by Sir D. Brewster from among the living. Mr. Wheatstone having found, on the publication of his second memoir in 1852, that his first (of 1838) was far from being generally known, caused it to be republished in the *Philosophical Magazine;* and it then, for the first time fell under the notice of Mr. Elliot, a teacher of mathematics in Edinburgh, who forthwith announced his own claim to priority in the idea that the union of the two dissimilar retinal pictures is the source of our appreciation of the *relative distances of different objects*. This idea, and the means of putting it to an experimental test, occurred to him, he states, in 1834; but he did not carry it out till 1839, and he then constructed, not a stereoscope, but merely a pair of pictures which he superposed by the convergence of the optic axes; and these pictures consisted,

* Sir D. Brewster speaks of the Pseudoscope of Mr. Wheatstone as "a most capricious and unsatisfactory instrument, which often fails to show what it ought to show." So far is it from deserving this contemptuous description, that, as I have shown in the *Edinburgh Review* for October, 1858, it is an instrument of the most singular value, as furnishing the means of testing the degree of tenacity with which our *minds* hold to their habitual appreciation of the forms of the several objects around us, notwithstanding the reversal of their retinal images, which, on the purely optical doctrines of Sir D. Brewster, ought in every instance to produce a "conversion of relief."

† In fact, he expressly states that when the object is placed directly in front of the eyes, the στερεα or optical pyramids are similar.

‡ See THE BRITISH JOURNAL OF PHOTOGRAPHY for Aug. 1 and Aug. 15, 1860.

* In commenting upon this statement of Sir D. Brewster, I was unfortunately misled by a letter from Prof. Kuhlmann, of Lille, to Mr. Wheatstone, into charging Sir D. Brewster with dishonesty in asserting what he must know to be untrue from an inspection of photographic copies of these pictures, which I believed to be in his possession. "This," says Sir D. Brewster, in his usual style of invective, "is a falsehood *invented* by Dr. Carpenter." Having given adequate authority for my statement that the photographs had been forwarded to Sir D. Brewster, but having been assured by him that he had not received them, I frankly retract the charge of dishonesty, and express my regret at having been led to make it; but I do not plead guilty to having *invented* the falsehood.

† As Sir D. Brewster has assumed that Mr. Wheatstone and *his friends* (among whom he includes every person who coincides with him in this opinion) cannot see the stereoscopic effect of these pictures because they require transposition, I have separated and transposed them without in the least improving the effect; and the fact that the pictures are seen nearly as well in one way as in the other—some parts being seen in relief when they are placed L and R, and others when they are placed R and L—shows that the pictures are not truly stereoscopic.

not of perspective projections of solid objects, but of landscape sketches with three distances, which distances, by this superposition, were rendered distinguishable.

Thus, whilst Mr. Elliot may fairly claim to have made a very near approximation to the essential principle of the stereoscope, he did not apply it to the reproduction of solid forms, and did not devise any other method than squinting at the two pictures for bringing them into apparent superposition.

Another candidate for the same honour has more recently appeared in the person of Mr. George Maynard, formerly of Caius College, Cambridge, now of Toronto, who published in the *Toronto Times*, October 8, 1856, an article *On the Bathoscopical Effects of Binocular Vision and the Principles of the Stereoscope*, which he states to be a reproduction, with a little amplification, of an article he had published in 1836 on the same subject.

So far as can be judged of his first article from his second and amplified edition of it, I have not the slightest hesitation in affirming that Mr. Maynard advanced nothing that was new to any person acquainted with that doctrine of the appreciation of the relative distances of near objects by the sense of convergence of the optic axes, which has been long familiar to physiologists. Of his knowledge even of the dissimilarity of the two retinal pictures I can discover no distinct indication. That the union of these two dissimilar pictures has any connexion with our notion of solidity, there is not the faintest hint; and to the invention of any kind of stereoscope Mr. Maynard puts forward no claim whatever. Thus, therefore, he is really out of the field.

Let me now recall to your recollection the following dates, the accuracy of which is beyond all reasonable question:—

In 1832 Mr. Wheatstone *completed the construction* both of the *reflecting* and of the *prismatic refracting* stereoscopes.

In 1833 Mr. Wheatstone *published* in Mr. H. Mayo's Physiology *the essential principle* of the stereoscope.

In 1834 Mr. Elliot states that he *thought* of an approximation to the essential principle of the stereoscope, and of a means of experimentally testing it.

In 1836 Mr. Maynard published a paper which related simply to the estimation of distances by the conjoint use of two eyes.

In 1838 Mr. Wheatstone *published a full account* of his investigations on binocular vision, and of his invention of the *reflecting* stereoscope.

In 1839 Mr. Elliot experimentally tested, by the ocular superposition of two pictures, his imperfect notion of the principle of the stereoscope; but he did not invent a stereoscope of any kind.

In 1849 Sir D. Brewster *published* his invention of the *lenticular* stereoscope.

In 1852 Mr. Wheatstone *published* his invention (actually completed in 1832) of the *prismatic refracting* stereoscope.

In 1852 Mr. Elliot *published* an account of his experiment of 1839.

Thus it is obvious that *alike in the conception, the verification, and the publication of the essential principle of the stereoscope, Mr. Wheatstone's priority is indisputable;* and you will scarcely be prepared to credit me when I state that within the last few weeks it has been asserted by Sir D. Brewster, with a full knowledge of those dates, that "Professor Elliot and perhaps Mr. Maynard *have as good a claim* as Mr. Wheatstone to the invention of the stereoscope." This extraordinary assertion affords a melancholy proof of the extent to which a perverse determination to see things in a wrong light can carry a man, whose scientific eminence and academical position give a weight to his assertions in public estimation which ought to make him doubly, triply careful of their correctness.

While Sir D. Brewster was thus doing all in his power to depreciate Mr. Wheatstone's scientific merits, and at the same time to exalt his own—so as to endeavour to make it appear that his own claims as the inventor of *the lenticular stereoscope* were at least on a level with those of the real discoverer of the essential principle of stereoscopic vision—he did not venture himself to put forward a claim to the invention of *the stereoscope*. This claim, however, was put forth in his behalf by the "London Stereoscopic Company," which was established not long after the Great Exhibition of 1851, and which advertised most extensively in the periodicals and serials of the time in terms like the following:—

"LONDON STEREOSCOPIC COMPANY.
"No Home without a Stereoscope.

"This delightful invention of Sir D. Brewster's is unapproached for the exquisite entertainment it affords in the social and domestic circle," &c., &c.

With variations according to season and circumstances, this advertisement was repeated, not merely for months but for years (I show you a copy of it in the *Athenæum* for December, 20th, 1856); and I ask any person who is competent to understand the meaning of language, whether it does not most explicitly claim for Sir D. Brewster the whole merit of the invention of *the stereoscope?* The advertisement has been recently justified by Sir D. Brewster* and by Mr. Nottage (the manager of the London Stereoscopic Company) on the ground that it was intended to apply solely to the particular instrument manufactured and sold by that company, and that, as they did not manufacture or sell Mr. Wheatstone's instrument, they were in no way called upon to include it in their advertisement. Such an excuse, as you must at once see, could only be admissible if the Stereoscopic Company had announced itself as "established for the sale of Sir D. Brewster's Lenticular Stereoscope," and had expressly limited their claim in his behalf to the invention of *that* instrument. There was no reason why they should be required to manufacture and advertise Mr. Wheatstone's reflecting stereoscope if they did not find it to their commercial interest to do so; but there *was* a reason why they should not have announced Sir D. Brewster as the inventor of the stereoscope—namely, that truth and honesty forbad their doing so. If their advertisement was justifiable, then, if Mr. Wheatstone were to construct a new form of kaleidoscope, and a company were to be established for its manufacture and sale, he might be rightly advertised as the inventor of *the kaleidoscope;* so the inventor of the screw-propeller might claim to have introduced *steam navigation;* and every person who devises a new telegraph instrument is to be regarded as the inventor of *the electric telegraph.*

What has been the effect of this reiteration on the popular mind, I have had abundant opportunities of judging.† That large portion of the public press which had no special information on the subject accepted the statement as an uncontroverted fact, and, of course, carried their readers along with them; while they furnished the advertisements of the "London Stereoscopic Company" with choruses of praise to Sir D. Brewster and the company, of which I give you the following sample:—

"The two become one, and produce effects unknown to art. No family or school should be without one. It is one of the wonders of our age."—*Britannia.*

"Sir David Brewster, for this charming discovery, deserves the thanks of the nation."—*Morning Chronicle.*

The collocation of these two sentences is not mine, but is that of the advertiser;‡ and I put it to you what other possible meaning their union can convey, than that Sir D. Brewster deserves the thanks of the nation for the charming discovery that the two become one, and produce effects unknown to art?

I fearlessly ask, then, if I have gone one whit beyond the facts of the case in asserting that Sir D. Brewster not only "permitted others to represent him as the inventor of the stereoscope,"§ but that "he has allowed his own book to be made the medium of diffusing, year after year, an advertisement virtually attributing to himself the invention of the stereoscope, which he well knew to be untrue?" ‖

Of the effect of this continued misrepresentation upon the public mind, we have a signal exemplification in the fact that Mr. Thomas Jones Barker last year advertised a picture entitled *The Intellect and Valour of England*, in which English intellect was typified by Sir D. Brewster announcing to a group "his discovery of the stereoscope." Sir D. Brewster states that, immediately on seeing this advertisement in *The Times*, he wrote to Mr. Barker, informing him that he was "not the discoverer of the stereoscope, but only the inventor of the lenticular stereoscope now in universal use," and he forwarded a copy of this letter to *The Times*, in whose crowded columns its brevity might readily cause it to be overlooked by others, as it was by myself. Sir D. Brewster seems to think that this tardy disavowal should be sufficient to remove from the public mind that erroneous impression of his claim to the invention

* "The Company," says Sir D. Brewster, "manufactured and sold *my stereoscope*, and their advertisement *of it* was literally and perfectly correct."

† Thus, in the article "Stereoscope," in Knight's *English Cyclopædia*, we find all that Mr. Wheatstone has done dismissed in a few lines, with the statement, given on Sir D. Brewster's authority, that "writers in every age knew the two facts that the pictures on the retinæ of the two eyes are dissimilar, and that by the union of these two flat distinct pictures we obtain the vision of solids;" whilst nearly a column is devoted to the account of Sir D. Brewster's own contributions to the inquiry, which are treated as of much higher value.

‡ They are thus placed at the head of a *Catalogue of Binocular Pictures of the London Stereoscopic Company*, which is bound up with Sir D. Brewster's *Treatise on the Stereoscope* (published in 1856), and which is issued in every copy of that book sold across Mr. Murray's counter to the present time, as I have lately taken means to verify.

§ This assertion I made explicitly more than three years ago in the pages of the *Edinburgh Review;* yet Sir D. Brewster took no notice of it whatever, until, in a lecture recently delivered at Bristol, I used a very strong term of reprobation in reference to the claims he has put forward, and allowed others to put forward in his behalf. The word "nefarious" was uttered without due premeditation; and I gladly avail myself of this opportunity of expressing my regret that it escaped me. I most certainly should *not* have used it, had I been aware of the disclaimer which Sir D. Brewster inserted in *The Times* of June last.

‖ Letter to the Bristol *Daily Post*, Feb. 12, 1862.

of "the stereoscope," which he affects to attribute to the fact of his being "the inventor of the lenticular stereoscope, and the first person that gave the true theory of the stereoscope" (as regards which last point he may not, being an interested party, be an impartial judge); and he not only altogether refuses to admit that the continued reiteration of the claim in his behalf, explicitly put forth and extensively diffused for *nearly ten years* by the London Stereoscopic Company, has had anything to do with it, but he so far justifies and sanctions that claim as to encourage its continuance!

I put it to you, therefore, whether it is not due to Mr. Wheatstone that those scientific men who have studied this question, and who have followed all the stages of it from its commencement, should freely express their convictions upon the subject, without being deterred by the unsparing vituperation which Sir D. Brewster considers to be the language befitting his scientific and academical position.

It is doubtless unpleasant to be styled (as I have lately been*) "malignant, vulgar, and coarse," and to be held up to public odium as the "malicious" utterer of the "grossest untruths with every opening of his mouth;" but I had much rather put up with this, than shrink from the advocacy of a cause which I am satisfied to be that of truth and justice. I have been asked why I have specially put myself forward in behalf of Mr. Wheatstone, instead of leaving him to fight his own battle? I reply, simply, that I have had so strong an interest in his researches on Binocular Vision, from the first announcement of their results nearly thirty years since, to the enunciation of those of still higher importance—psychologically as well as physiologically—contained in his second memoir, that I should be doing violence to my sense of right if I did not give him such support as my advocacy can afford. I have no personal quarrel with Sir D. Brewster,† and have no unworthy purpose to serve by disputing his assertions. He might well rest on his own well-earned fame, without refusing to others what *they* may justly claim. But whenever I see a man, however eminent in position or distinguished for attainments, using his *prestige* with the public either to grasp what is not his own or to detract from the merits of another, I feel strongly moved by the English love of fair play to strike a blow in defence of the assailed party—whoever he may be—and to aim it with more vigour in proportion to the measure of injustice attempted; and I consider it the more incumbent upon any scientific friend of Mr. Wheatstone to speak openly and fearlessly upon the points in dispute, because he is well known to have his own mind so constantly engrossed by researches of the greatest importance to public as well as private interests, as to have but little time or thought to spare for the defence of his purely scientific claims. The philosopher to whom (more than to any other living man) we owe the Electric Telegraph, is one whose righteous cause any one may be proud to advocate.

MICROSCOPIC PHOTOGRAPHY.‡

By A. L. Neyt.

The attractive and mysterious study of the infinite minutenesses of creation, by the microscope, has induced me to seek some practical method as a substitute for drawing by the hand or by means of the camera lucida—a method at the same time more rapid and more exact. Up to the present time microscopists desiring to publish their observations are constrained to draw them and entrust to engravers who are strangers to the science the task of retracing these designs. In this way the most important details are often neglected or inaccurately rendered; for it is very difficult to an artist, and even to many microscopic observers, to avoid giving their own *conceptions* when they desire to depict those parts which the microscope has not perfectly resolved. From whence it arises that new discoveries often give rise to discussions, and, as it is difficult to preserve an object sometimes more than a few hours, it becomes impossible to submit it for the examination of other observers, with the object of arriving at a definite conclusion on the subject. I have thought that photography could remove these obstacles by furnishing a rapid and faithful means of reproducing the observations made by the microscope.

At the time I commenced my researches I was not aware that M. Bertsch, of Paris, who has rendered much service to science, had previously produced several photographs of microscopic objects. An English photographer, and also another in Munich, have been equally occupied in this direction; but no one has at present reproduced living animalcules, such as *infusoria*, and it is upon this branch of the science that I have directed my efforts. I would here subjoin some examples of my labours.

The apparatus which I have employed is the heliographic microscope of M. Bertsch, constructed by M. Hartnack, a worthy successor of the celebrated Oberhaeuser, his uncle. This instrument is wonderfully perfect both in its mechanical and optical arrangements. The general aspect is similar to an ordinary solar microscope. It may be divided into the following parts:—

The mirror with parallactic movement, used to reflect the solar rays in a constant direction, is replaced by a large prism which gives a complete reflection and offers less resistance to the wind. It is, therefore, beautifully steady. The effect of reflecting mirrors is lost at a distance on account of their being tinned. The achromatic condensing lens is 2¾ inches in diameter; in the focus of which are placed three converging lenses, which may be moved either separately or together, according to the power of the object-glasses employed.

I have attached to this, two diverging lenses complementary to the focus of the condensing lens in order to obtain a ray of parallel light in those cases where lenses of large field are used, such as are necessary to obtain great sharpness. The apparatus is achromatised in such a way as to make the yellow and violet rays coincide, these latter being the actinic rays. In ordinary apparatus, as is well known, it is the yellow and red rays which are reunited; but in this case too much heat is developed on the object to be reproduced: besides which, we should have a visual focus which would not correspond with the chemical focus, and this would give rise to an almost insurmountable difficulty in focussing, an operation always sufficiently delicate, without the addition of obstructions which may be avoided. The microscope constructed by Hartnack transmits all the rays horizontally: we are obliged, therefore, to work on a vertical plane, which is very troublesome when operating on liquids, such as is necessary to be done in reproducing *infusoria*. The little glass which covers the object is retained, it is true, by the drop of water; but, if it be a little too heavy, the whole of it slides insensibly from its normal position, and hinders the work. If this do not happen there is yet another obstacle which presents itself. The water has a tendency to form near the edges of the thin covering glass a greater depth than at the centre—that is, it accumulates at the edges by capillary attraction. The animalcules seek refuge incessantly in this greater depth of water, finding here greater liberty, and they are, consequently, always going out of the field. To obviate this inconvenience I have brought the plane of the instrument into a horizontal position, interposing under the focus an illuminating prism, and then *immediately* above the object-glass a second prism (this may be in quartz and as small as possible) which sends the rays in a horizontal direction. In this way the difficulties detailed above may be removed, and, for the remainder, they are no more than have existed hitherto. The loss of light arising from the interposition of two prisms amounts to nothing.

Immediately under the object are placed a graduated series of diaphragms. I add to these, either at the point where the rays leave the instrument, if I use it horizontally or in the dark chamber (if I have it bent), a compensating prism. I throw the image on the focussing-glass of an ordinary camera without a bottom, and I focus. This done, it remains to regulate the focus. By varying the position which it occupies a greater or less intensity of light may be obtained. When the focus is brought to bear exactly on the object, the image of the sun is formed at the same time upon the screen or ground-glass. By throwing the focus a little behind, a blue point appears in the centre of the field, which, however, disappears in the enlargement. The adjustment of the lenses should be arrested when this point spreads itself over the whole surface of the image, since we have arrived by this means at the maximum amount of *chemical* illumination. The remainder of the operation consists in receiving the image on the sensitive surface, in the same way as in taking an ordinary portrait or landscape—the microscope in this instance acting as the object-glass. While I am uncovering the sensitised glass in the camera I intercept the light by means of a yellow coloured glass, taking great care that the room is well shaded from light. I then withdraw the

* See Sir D. Brewster's recent letters to the Bristol *Daily Post*.

† Sir D. Brewster has endeavoured to make it appear that my charges against him in regard to the stereoscope have been put forward in retaliation for his criticism (in the *North British Review* for 1856) on my Manual, entitled *The Microscope and its Revelations*. In this imputation he seems to judge of *my* motives by *his own*—the fact being that I had felt called on to express myself pretty strongly upon the injustice of his claims in the fourth (1853) and fifth (1855) editions of my *Human Physiology*, long before the appearance of the critique in question. The remarks I there made were prompted (I well recollect) by the article to which I have referred in the *North British Review* for 1852, and by the reiteration of the advertisement of the London Stereoscopic Company, attributing to Sir D. Brewster the invention of the stereoscope.

‡ From the *Bulletin Belge de la Photographie*.

yellow glass suddenly in order that every part of the picture shall be equally exposed. The length of exposure (other circumstances being equal) varies with the enlargement required. In good sunlight a linear enlargement of twelve hundred times may be obtained in seven or eight seconds at the most. Those of about three hundred times do not require more than the fraction of a second. Sometimes I replace the yellow glass by a shutter, in which the duration of the exposure is regulated by a little wing similar to that which is applied to the striking of a clock.

The process which I regard as the most suitable for the purpose now under consideration is the wet collodion process. The remainder of the operations is in every respect similar to the ordinary known methods of operating.

In the reproduction of *infusoria* a great difficulty presents itself—namely, their very rapid movements among themselves—the effect of which is augmented by the enlargement. Notwithstanding the rapidity of the operation, it is still too long to secure the vibratory motion of the *ciliæ*. To kill them by poison is not quick enough, and deforms and distorts some of them by convulsions. In order to attain the object in view I have recourse to the electric spark or to a galvanic current. I attach to the stage the two poles of a Daniell's battery or of a small induction coil in such a way that the poles shall be in contact with the drop of water. The circuit is interrupted near the source of the current which I have near my hand. I follow the movements of the *infusoria* on the glass by means of the yellow glass. When I consider the position favourable, I complete the current by simple contact. The animalcule is killed as with a thunder-stroke in the place I have chosen. I then expose. With a little practice this operation becomes simple and easy.

When it is desired to reproduce objects of a yellow or brown colour—which colour does not admit of the passage of actinic rays—I avail myself of a small polarising apparatus, which I introduce under the object at the point of focus. In this manner I can modify the general tint and render it more photogenic.

The application of photography to the reproduction of microscopic observations may be made, I think, to render great service to science, by allowing the possibility of supplying the public at a low price with plates illustrative of microscopic investigations,—these plates having hitherto been of much too high a price.

It will be possible also to furnish impressions of these plates on copper, engraved by the ingenious heliographic process of M. Chas. Nègre. These plates will possess incontestable accuracy and a delicacy to which the hand of man could never attain, and would be producible at a very much reduced price when compared to ordinary engravings. I send with this communication some proofs of crystals illustrating the phenomena of polarised light.

[Want of space obliges us to postpone until the next number the expression of the high opinion we entertain of the interesting labours of M. A. L. Neyt.—*Ed. Bulletin Belge de la Photographie.*]

Exhibition Gossip.

THE BUILDING.

INTENDING to solicit the pleasure of our reader's company in some proposed gossipping rambles about the Great Exhibition of this notable year, we venture to bespeak some attention for a little preliminary gossip about sundry matters therewith connected.

In the first place, then, we have before us various photographs of the building in which this "world's fair" is to be held. Now, for judging the actual merits of any architectural work commend us to your photograph. There is the thing! Not as the sanguine architect or imaginative draughtsman conceived it, but as it actually exists; not as we *might* see it from some impossible point of view, but as we *do* see it from some come-at-able spot in actual existence. Captain Phillpotts, at the Society of Arts, the other evening, read a paper laudatory of Captain Fowke's design, and illustrated it with a large drawing of the building as it might possibly appear if situated in the midst of a vast open space, with nothing to intercept the view save one or two picturesque *trees* and groups of pedestrian and equestrian figures in particularly gay attire. But how different is the story told by these unprejudiced truth-speaking witnesses—these photographs! Of what use is it to rear a building in which insignificant parts are only lost in the finished beauty of a magnificent whole, if as a whole it never can be seen? You remember Albert Smith's story of the amateur's photograph of *Strasbourg Cathedral* (was it Strasbourg, by-the-by?)—it was there you know, only *you couldn't see it because* of the fog. Well this does not appear more funny to us than the neglect of visible parts for the perfecting of an invisible whole; and to this charge—on the evidence of these dumb photographic witnesses—we fear that Captain Fowke is open.

The critics just now are very busy, and very loud in their expressions of opinion, favourable or adverse, cold, lukewarm, or red hot; but all their criticism seems to be directed more or less to the building as a whole, or, in other words, as (save in architects drawings and the shoals of engravings therefrom) it never will be seen. But what say our photographs? Let us turn to them.

These huge domes certainly have a very imposing appearance. Their vastness is very conspicuous—in fact, *too* conspicuous; for, were they better adapted to those portions of the building which support them, it is not their size which would constitute their most striking element of effect—for quantity is *not* more valuable than quality—but rather general grandeur of effect and beauty of proportion. A contemporary, speaking on the same subject, says that "enormous diameter, disproportioned to height, is no more admirable in a building than in an alderman."* And we fear (however painful and humiliating the fact may be to such of us as are of aldermanic proportions) that this assertion cannot be gainsaid. The domes, then, are not so fine or grand in these sun-pictures as they seem either in the official wood-engraving or in Captain Phillpotts' drawing,† but rather appear out of keeping or harmony, looking as if they had belonged originally to some loftier and differently-constructed building, and were here by mistake or accident: therefore, we say again, for judging the actual merits of any architectural work, commend us to your photograph.

The principle façade is a very different thing when drawn from the ideal point of view referred to and when depicted as seen fro m the Cromwell Road, standing in a place whence the upper and lower parts immediately before you cannot be seen at once, and the building stretches away into perspective on your right hand and your left. This again is very apparent in our photographs, although not even hinted at in the ideal views. But the views from any of the various aspects in these photographs only serve to strengthen the above impressions; and those of the principal entrances situated, somewhat unusually, in the side fronts—that is to say, in Exhibition Road and in Albert Road—do not tend to their removal.

On entering the building you perceive a peculiarity of the site which, as the larger portion of the edifice is intended to be permanent, can scarcely prove an advantage, viz., that the ground it stands on is quite four or five feet below that surrounding it, which itself lies nearly forty feet lower than the level on which the 1851 building stood. It is true that this will originate a very striking and doubtless picturesque feature in the shape of a raised dais at each entrance, from which, standing amid flowers and fountains and other elegant decorations, we shall be first greeted on our visit to the Exhibition with a very comprehensive and imposing view of the greater portion of the place, with all its varied wealth of art and industry, and its crowd of holiday visitors. Still, as durability and comfort must prove items of considerable importance, this plan may turn out objectionable.

But, as from other sources, or from personal inspection, our reader is doubtless familiar with all the details of the building, we shall with a few more particulars conclude *this* little bit of preliminary gossip. The building extends from the Horticultural Society's new gardens to the Cromwell Road in one direction, and from the Exhibition Road to the Albert Road in another. Its external length is 1,200 feet, and its breadth is 700 feet‡—nearly double the dimensions of the Crystal Palace of 1851. The picture galleries will be found extending along the front of the building—right and left as you enter—and along the east and west sides (we hope to visit them, as photographers, in your much-esteemed company). The nave is 80 feet wide, 1,200 feet long,§ and 100 feet high, measuring to the angle of the roof; and the two transepts, of the same height, are 85 feet wide by 700 feet long. When we wish to visit the courts appropriated to manufactures and to the competing nations, we shall seek the spaces adjoining the nave, north and south, and the galleries by the nave and transept. When we are hungry and athirst we shall seek that locality called the refreshment department, and find it in a line parallel to the nave. When we want photography we shall have to go here, there, and everywhere, and take it a little meagre bit at a time, in consequence of other

* The *Art World*.

† Not that their grandeur is remarkably impressive, though, even there.

‡ Even these measurements do not include the separate portion appropriated to machinery, which is about 1,000 feet long by 220 broad.

§ Including the vestibules under the domes.

countries insisting upon exhibiting their photography in their own department, and *under their own classification*, instead of proudly securing it the distinguished honour of appearing as Class 14 in the English mechanical section. We have something to say, however, in a gossip about this shortly. And here we may leave alone the building as it now stands, for with all its faults it is undoubtedly the production of a very talented gentleman; and when we consider that this vast edifice, ranging over twenty-one acres of ground, is the wondrous work of only twelve short months, we ought not to criticise too closely or detect mistakes too readily. Besides, we owe Captain Fowke some warm gratitude for his arrangement of one of the best-lighted picture galleries in the world—that of South Kensington. *Bon jour.* A. H. WALL.

"NOTES," HARMONIOUS AND DISCORDANT, ON VARIOUS SUBJECTS.

By J. T. Taylor.

Who Should Get the Medal?

The recent award of medals for the best pictures in the Exhibition of the Photographic Society of Scotland furnishes subject matter for a few remarks. Among other medals, one for the best portrait in the Exhibition was awarded to Messrs. D. O. Hill and A. M'Glashon. Mr. Horatio Ross, in the course of making his award, stated that he could not say *how* the medal should be awarded to these two gentlemen, or whether it might not be advisable to give two medals—one to each of them: this he stated would, he had no doubt, be satisfactorily adjusted afterwards.

From these and other remarks it would appear that the medal was awarded to the two gentlemen mentioned *as being partners* in the production of the prize picture. How, then, comes it that at the next meeting of the aforesaid Society we find the medal awarded to Mr. D. O. Hill *exclusively*, ignoring the claims of the photographer and admitting those only of the artist? If the Council had a reason for this why were the members not made aware of it? But if their reasons would not stand investigation would it not have been better to have dispensed with a public presentation of the medal, and sent it privately to Mr. Hill in an envelope? In a purely photographic society it is surely too much to overlook the claims of the photographer in those of the artist.

In order that the readers of The British Journal of Photography may understand something of this matter, allow me to state that the picture to which the prize was awarded was a portrait of Dr. John Brown, of *Rab-and-his-Friends'* celebrity, with his cousin, Dr. John T. Brown. It will be recollected that in the notice of the Exhibition which recently appeared in these pages, this picture was characterised by your critic as possessing peculiar merit. Not only that, but all the other pictures of these gentlemen were favourably noticed, both for their artistic ability and their photographic merits. If the one was great so was the other. The photographic difficulties in connexion with such large-sized plates were most meritoriously encountered and successfully overcome, to say nothing of their excellent qualities in other respects. Mr. D. O. Hill occupies a high social position in Edinburgh, and in his public capacity as Secretary of the Royal Scottish Academy exercises great influence in the artistic world. Mr. M'Glashon, on the contrary, although most highly respected as a citizen, is by no means so prominent as a public man; but surely this could not have had any influence in what many of those interested in the matter have considered a seeming partiality in the award.

As the Photographic Society of Scotland has taken the initiative in awarding medals for the best pictures, the remarks which follow may be considered as upon the system generally rather than on this Society's policy in particular.

Two excellent papers on this subject have been contributed to the world—the one by the Editor of this Journal, which, although short, was exceedingly to the point; the other by Mr. John Cramb, of Glasgow. The former calls attention to the anomalous procedure adopted by a society in its determination to give a *silver* medal for the prettiest picture in an Exhibition, while inventions and discoveries in the art were to be rewarded by a *bronze* medal. This scarcely requires any comment; but let us see how it looks when reduced to practice. The better to do this, we will assume that collodion has not yet been published as a medium on which to take a photograph. Paper, for landscape negatives, and silvered plate, for positive portraits, still hold the sway; and for the best productions in these *silver* medals are awarded—when a public benefactor appears and freely communicates a COLLODION PROCESS, and for this, the labour of months, perhaps of years, the results of mental toil and unremitting experiment—for this discovery which gives employment to thousands, and almost revolutionises photography, he is supposed to have received an adequate acknowledgment in the presentation of a *bronze* medal; while another man, who, it may be, by the merest haphazard, manages to take the best of a series of pictures by this bronze process, receives as his reward a medal in the pure Potosi metal. That the obvious tendency of this is to discourage scientific research is evident. If the odious distinctions of silver and bronze medals are to be persisted in by photographic societies, let me suggest an alteration in their respective awards, and recommend that silver medals be given for inventions and discoveries and bronze (if any medals at all) for meritorious pictures. Who would say that a medal of the baser metal would be a suitable acknowledgment to Sir David Brewster for one of his inventions, by means of which an impetus totally incalculable in its magnitude and results has been given to photography—I allude to the refracting (or ordinary) stereoscope. For an invention of this nature I could only suggest a medal of *gold*, seeing we are unacquainted with a nobler metal.

One morning, a few years ago, I met my friend, Tom Pepper, sauntering out beyond the south side of Edinburgh, with a stereoscopic camera under his arm; and, knowing that only two days previously he scarcely knew a camera from a lens, I accosted him—"Hillo! Tom, where are you bound to with the camera?" "Oh," replied he, "I am going to photograph—by the *royal road*." "But how?" "Well, you see, I have got a loan of Brown's camera, which requires no focussing, the lens being fixed at the right distance for views; and I have bought a packet of Hill Norris's plates, which are prepared ready to hand, and R. A. tells me that a fine view of Craigmillar Castle can be obtained from a gate at the south side of it: so I intend taking the castle, which I can scarcely fail in accomplishing if I point the camera at it." "Well, but how about the exposure, and the developing, and the printing?" "That's easy enough," replied Tom: "the time of exposure is printed on the packet, and Jones, who does a trade in developing the negatives of amateurs, will develop all mine for a trifle. Mrs. Carson, the photographic printer, will afterwards print as many as I desire." The result of all this was, that Tom that morning obtained a view of such excellence that, when sent to the Formosa Exhibition, by universal consent he was awarded a medal! *For what?*

But a glance over Mr. Cramb's paper* brings me back to the original subject. The paper itself I need not criticise. Notwithstanding all that his brother Secretaries of the Birmingham and South London Societies have written in reply, Mr. Cramb's position is felt by many—at least in Edinburgh—to be impregnable. Mr. Cramb, after some remarks on the tendency of competitions, urges the propriety of the *conditions* of competition being laid down so clearly that, as on a race-course or at a flower show, any one may see who is the successful candidate. He asks—"*What is required to be rewarded?*" and expostulates against being asked to run a race without knowing the course or where the winning-post is.

Now let us see how Mr. Cramb's remarks apply to Mr. M'Glashon's picture. A medal is awarded it: no "reason why" is announced. The picture is the joint production of two gentlemen—one of whom, an artist, receives the medal; the other, who is a photographer, is ignored. Was this medal awarded for the *grouping* of Dr. John Brown and his cousin? or was it for the *photographic skill* displayed in the execution of the picture? Whether for the one or the other I think with Mr. Cramb that it would be well that the conditions of competition were so definite that any one aware of them could, by using his eyes, satisfy himself. With respect generally to the system of giving medals, I would urge on the Council of the Photographic Society of Scotland to consider the propriety of *discontinuing* it, as its tendency is injurious. In my own narrow circle of acquaintances I am aware of several excellent photographers who decline to contribute to the Edinburgh Exhibition, alleging this as the reason.

Passing from the *result* of collodion, let me now sound a brief note on collodion itself

Muriate of Morphia in Collodion.

I observe from a contemporary that Mr. Bartholomew has given publicity to an old process of Mr. Mackinlay's, on whose authority a verbal communication was, some two or three years ago, made of it to the Photographic Society of Scotland. I allude to the supposed new discovery of the advantages of a solution of muriate of morphia in collodion. Mr. Tunny, of this town, I know did

* *On Photographic Competition.* British Journal of Photography, Vol. VIII. p. 405

make several experiments with it in consequence; but whether the advantage claimed for it, viz., greatly exalted sensitiveness, was realised by this experienced photographer, I cannot at present say. But, as regards its novelty—*verb. sap.*

The Song of the Shirt.

"My Kate she is a winsome wife;
There's nane sae free frae evil,
Except upon a washing day,
And then she is the ———."—*Old Song.*

Such thoughts were doubtless passing through the mind of Mr. Macalton as, one evening, I met him on the Mound, apparently homeward bound. In a state of great excitement he accosted me thus:—"I am really afraid to go home to night, for I have been trying my hand at photography to day, and my wife will take the very head off me: she nearly did so last time on far less provocation. See *here*, and *here*, and *here!*" And sure enough my friend's hands, face, shirt collar, breast, and waistbands were in a deplorable condition: gallic acid and silver had done their worst on him. To avert the storm, I walked home with him, and we were smilingly received by his pretty wife, who soon, however, seemed to discover what was wrong; but, with woman's tact, she evidently reserved her fire till the fitting time.

According to agreement I introduced the subject of dirty shirts and silver stains generally, of course making light of the matter. Mrs. M. eagerly caught at the bait. "Was it possible to remove such stains? for Mr. M. had made *such* messes of his shirts! The washerwoman had boiled them and rubbed them, but the spots were as black as ever. That tiresome photography had surely been invented to break poor women's hearts!" I assured her that it was a very trifling matter, and that if she would allow me I would give her a lesson in the art of removing such stains. This was eagerly responded to; and, while Macalton's soiled linen was being procured, I selected from his stock of chemicals the following:—

Spirits of wine	2 ounces.
Iodine	1 drachm of each.
Nitric acid	
Muriatic acid	

A camel's-hair brush charged with this solution was applied to the blackest spot we could select, which was at once converted into a yellow one (iodide of silver) with blue edges. It was now ready for being treated with any of the solvents of iodide of silver; accordingly, after a slight rinsing, a weak solution of cyanide of potassium was applied, which at once restored the part to its original whiteness. I explained that a recent stain might be removed by a strong solution of cyanide of potassium alone, the solvent action of which, however, was said to be much increased by the addition of a small quantity of iodine, and recommended that, in case of emergencies, he should keep these solutions ready mixed up. Stains on the hands were at once removed by the foregoing application: not so, however, a black spot on M's lip, which I thought it safer to treat with a solution of *iodide of potassium*. A hot solution of oxalic acid entirely removed a huge iron stain from a shirt sleeve; but muriated acid, followed by rinsing in warm water, will be found as efficacious as any other application. A solution of bichloride of mercury applied to a stain of the most desperate character will apparently cause it to disappear for a time; but it is not *removed*, and may at any time be recalled from its latent condition to resume its former intensity: hence this potent substance is not recommended for the purpose of removing stains.

Believing that some of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY may be in the same plight that Mr. and Mrs. Macalton were, these remarks are penned for the benefit of those concerned.

ON NEGATIVES SUITABLE FOR ENLARGEMENT, AND THE QUALITIES THEY SHOULD POSSESS.*

NEGATIVES intended for enlargement should unite in themselves certain peculiar characteristics not usually possessed by those produced with a view of printing paper positives, since ordinary negatives possess neither sufficient delicacy, or purity, or transparency. These are, however, indispensable conditions, to which the first importance should be attached when it is desired to produce good enlarged prints either on glass or paper.

The most observable distinction of a negative suitable for amplification is its transparency, which should be such that the lightest traces of a delicate design on paper may be seen through its darkest parts.

The image, when examined by reflected light, should not be dull: on the contrary, the best negatives for this purpose are brilliant, though slightly fogged in their lightest tints, but perfectly free from the numerous metallic spots which are easily observable in those negatives which have been slow in developing. The transparent parts, then, should be very pure, while the most opaque portions should admit of being read through.

It is necessary that the model should be carefully lighted, in order to preserve as much as possible a true resemblance, and to avoid too deep shadows, which always give hard proofs of an unpleasant aspect.

The best negatives are often those which are produced under a cloudless sky. Meantime, in no case should the light fall directly on the sitter: it should be transmitted through some light material such as silk or tarletan, forming the curtains of the roof which are spread above the head of the sitter. The glass sides of the room also should admit but very little direct light.

The lighting, in order to produce the most generally favourable effect, should be so disposed as to fall on certain salient points of the figure; and, with the object of avoiding the exaggeration of certain portions which might arise through this means, there should be placed near the sitter, and on the side opposite to that from which the light comes, a blue screen, stretched upon a frame, which will have the effect of materially softening the shadows.

The characteristics here given are but general, but the desired result may be easily obtained by introducing slight modifications; and, to give an example, we would say that a *carte de visite* negative, in which the apple of the eye can be distinguished or in which the pupils are well defined, good detail in the hair, the dress well rendered and gracefully disposed, the general tone pure and transparent, with vigorous portions bringing out the roundness of the figure—such a negative, we would say, is susceptible of furnishing a magnificent enlarged proof on a sheet of paper 22 by 18, or even 31½ by 23½ inches.

It is absolutely necessary to use thin glasses, white and as colourless as possible. Ordinary glass will not do, on account of the distortion to which it subjects the image. The negatives should not be varnished; but they should be carefully washed and dried equally.

Without giving in this article the details of manipulation, we have nevertheless thought that it would be useful to indicate the principal characters which should belong to this class of negatives. We will conclude by recommending our readers not to attempt the production of large negatives with lenses of short focus; for in all cases the subject which it is desired to reproduce should not be larger than a quarter-plate for ordinary solar cameras, and then it should be taken with a whole-plate lens.

* From the *Bulletin Belge de la Photographie.*

THE TANNIN PROCESS.*

By MAJOR RUSSELL.

CHAPTER VI.

[*By the special permission of the Author we reproduce the following.*]

DRY plates prepared with tannin give very good results when used for printing transparent positives by superposition. The action of the tannin and pyrogallic acid tends to produce a deep red colour, and the citric acid to give a blue tone; hence, by varying the proportion of the latter, we can produce at will a great variety of tints between a nearly pure neutral and various shades of purple.

Gallic acid, if used for developing, gives a green colour, so that if a brown tone be desired it can be produced by using first gallic acid and then pyrogallic: this, however, can only be done successfully when the tannin has been used in weak solution, not more than ten grains to the ounce, and when the negative is of rather low intensity; otherwise blurring will be produced round the dark parts of the positive (see note, page 84).

Plates prepared as described in the preceding pages will be found too sensitive to use in this way with direct daylight of ordinary power, one second's exposure, inside a north window, just before sunset, being quite sufficient if the negative be of that intensity which gives the best results. Plates so prepared may however be used for printing by ordinary daylight, if exposed horizontally on a table in a room which has a north aspect, care being taken to intercept the direct light from the window before uncovering the negative. Old collodion answers better than new in a strong light, from its giving a less sensitive film; but it is more liable to injury from pressure against the negative, being comparatively soft and porous.

Thirty grains of tannin to the ounce, on a horny collodion, makes a very hard film, little liable to injury in printing, and gives very vigorous and richly-toned positives. About three grains of citric acid must, in this case, be used for development with each grain

* Continued from page 85.

of silver, or the tone will be too red, and there will be danger of blurring and loose deposit, especially if the negative be intense. Should it be found difficult to use acid enough to prevent loose deposit without giving too cold a tone to the picture, acetic acid may be partially substituted for citric acid; but this difficulty is not likely to occur. Acetic acid may be used in the same way to produce a slight difference of colour.

It will be found difficult to obtain good results with certainty when daylight is used for printing, on account of the variation of light. By developing in the manner recommended for negatives, we can indeed correct the effects of under or over-exposure within certain limits: but it is scarcely worth while to take this trouble, especially as the shade of colour will vary with the kind of developer required to suit the exposure. An over-exposed picture, for instance, which requires to be developed with acid silver, and only a small trace of pyrogallic, though good in other respects, would be of too cold and inky a tone. The best way of working is to find, by experiment, a time of exposure and proportion of developing fluids which produce, in the case of each negative, the intensity and colour desired, and then to use the developer of full strength at once: by this means the development will be made very rapid, and, if an uniform artificial light be used at a measured distance, the best results will be obtained with great certainty.

Plates prepared as described for negatives are, from their sensitiveness, well adapted for printing by artificial light.

Tannin plates need no toning with gold, and not only have the advantage of producing very beautiful colours, but they admit of use with much more intense negatives than would be suitable in the case of other dry processes. A negative so intense as to give solarisation, with hard, wiry edges in the general way, will, if used to print on tannin plates, produce soft pictures, in which the only defect will be too red a tone in the dark parts. This redness may be neutralised by more acid in the developer, and the result will then be good, except that the lighter parts will be somewhat cold in tint. Judicious management of the exposure and development will so control and balance this difference of colour, that the effect will not be unpleasant in many subjects. To obtain absolute uniformity of colour in the light and dark parts it will, however, be advisable to use a negative of rather low intensity.

Negatives produced by the tannin process are, when a collodion giving a strong film has been used, better adapted for printing transparencies than those obtained by any other dry collodion process, from being much less liable to injury: they are also somewhat more durable than wet collodion negatives, the coagulated gelatine giving greater strength to the film below, and better adhesion to the glass; nevertheless, the surface is not so hard that it can be used unprotected, like albumen, and it therefore requires to be defended by varnish of some kind.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

SENTIMENT *(continued)*—COLOUR AS OBTAINED BY THE TONING PROCESS—"COLOUR" AS THE ENGRAVER UNDERSTANDS IT—VALUE OF THESE AS ELEMENTS OF EXPRESSION—THE WELFARE OF PHOTOGRAPHY LARGELY DEPENDENT ON ITS CULTIVATION AS A FINE ART.

"Every hue and shade has its corresponding shade of expression and *reciprocation*, affording the materials for the cultivation of taste; the sublimest expression vibrating in all cases to the most delicate touch."—*George Field.*

"The subtler or more spiritual art of the painter, like that of the poet, resides in the power of exciting or awakening congenial trains of ideas in the minds of the contemplative."—*T. Landseer.*

MY DEAR FELLOW-STUDENT,

Although my last concluded with a promise to speak in this of sentiment as associated with actual colour, the subject is one of so indefinite a character, is so open to dispute and doubt, and so difficult to establish upon sufficiently stable ground without plunging into a vast field of speculative and argumentative matter, that we had better, just now, I think, leave it alone to a great extent. I desire to speak only of such principles here as are more readily applied in practice, and which, judged by their effects, are universally appreciated, rather than those in which half-formed theories battle for precedence, and the imagination exerts an undue share of influence.

We habitually associate the rich gloom of a warm subdued light with solemn religious feeling, while cold dull light and heavy black shadows instinctively conjure up images of mourning and gloom, and the sunny brilliancy and variety of strong illumination in which the very shadows—in a weaker light so dead and black—seem palpitating with the life of light, never recall any but pleasant and cheerful associations. From time immemorial also good and evil have been associated, the former with light and the latter with darkness: thus the Sclavonians called the principle of evil the "Cherni Bog" or black god, and that of good the "Beil Bog" or white god. And that we should avail of these facts to express more powerfully the sentiments of our pictures, as we should avail of every other means to the same end, cannot be denied. Take, say a landscape full of the spring's joyous promise, with its bright green, its clear sky, and its pure and brilliant sunshine, and with flashing water, thickly encrusted with myriads of twinkling stars, dazzling in their changeful brilliancy: surely the delicate warmth of certain tones we wot of must be in more harmonious accordance with such a scene than the colder or more neutral; just as in a wintry scene, with that same water bursting angrily through the embraces of its gentle banks, sweeping in the strength of its stormy might over the once smiling landscape, and spreading ruin and desolation around, would be more forcibly expressed in the colder and blacker tones of our baths.

But, apart from the expression of sentiment by positive colour, the indication of colour by tone is an element of no less importance.

It has been thought the very perfection of photographic printing when the colour of the proof resembled that of an engraving; but the fact that the open stipple or lines of an engraving are entirely dissimilar from the flat, even, wash-like tints of the photograph seems to have been in very many cases entirely overlooked. The lines or dots are indeed black; but the spaces between—representing varied quantities of the element, *white*—give great transparency, and convert the whole into greys of more or less delicacy or intensity, although the lines or dots are all alike black. By this means the engraver renders what he terms "colour," translating each peculiarity of actual colour by some corresponding peculiarity of shade or tint, in a way precisely similar to that adopted for representing the *chiaroscuro*. To emulate the mere colour of printer's ink, therefore, with the idea that we thus come nearer the beauty of a good engraving, must be a very funny mistake. Neutral greys are quite different affairs to blacks; for all I here denounce is that heavy unpleasant effect given by too large a proportion of black in the finished proof. I pray you avoid it.

If photographers only knew the importance the artist-engraver attaches to "colour" in his proof—how anxiously he avoids monotony, leaden-heaviness, and gloom—how carefully he seeks crispness, and transparency, and brilliancy—it would be a hint worth taking. Truth and variety of texture are not more important in his eyes than truth and variety of colour, and all his work is carried out with the process of printing ever before him. In rendering, say the high lights of water, and those of a white chalk cliff, or white building, the engraver would never dream of using a white of the same intensity for both, well knowing that on the polished surface the white should possess the greatest intensity, and that he could only obtain this by subduing the light upon the unpolished surface, and that all effect of colour would be gone if white paper were the sole representative of both.

The engraver—I speak of the artist-engraver, not the mere mechanical cutter of metal or wood—generally complains that the photograph lacks tone and "colour," that is to say that its tints are too monotonous and too uncertain in their relationship, that various degrees of shade and tint are represented by tones not sufficiently diversified, and that there is a great deal too much pure white and pure black for real pictorial beauty. He thinks this constitutes a radical and incurable peculiarity of the photographic production which must always prevent it from competing with real works of art, and when he is startled by the sight of some such production as Robinson's *Early Spring*, he speaks of it as the offspring of some wonderful lucky chance not likely to occur twice or thrice in a life-time. Now we must alter all this: we must show the engravers and the painters that, although we ourselves have been to a large extent unconscious of the latent art-power of photography, that, as a sister art to their own, it is quite worthy the high position which the whole body of photographers have recently and publicly claimed for it.

Already photography may vie with any of the fine arts for the extent and importance of its applications. In moral and educational qualities, also, its influence is as large; and, as a branch of commerce, both directly and indirectly, few can be found who will deny its value; but in each and in all of these departments the greater its progress as a fine art the greater its importance to the country and to its professors. It is no part of my present purpose to point out these facts in detail. It must suffice to add that, in per-

fecting the truthful character of the art's productions, we serve the meanest and most mechanical of its applications, as well as the highest and most intellectual; that to widen our English field of practical excellence is to create and extend the commercial value of the art both in this country and as an article of export; and that while diffusing the knowledge of all that is rare and perfect in architecture, sculpture, and painting, by reproductions of the most unerring fidelity, we must do more for the art-education of a people and the refinement of public taste than has fallen to the happiest lot of even the most favoured of yet known arts. But, to make all this more widely felt, and to spur it into more vigorous action and prominence, we must not refuse the art that mental culture, upon which—as in these letters I have endeavoured to show—real excellence is so very largely dependent. The sentiments which exist in nature, when in their most expressive stage of development, must be duly sought and recognised before they can be depicted and rendered prominent in our productions. The thought which lives in sculptured stone must be sought in its phase of greatest power. The tones of a fine-art engraving cannot be altered in their relative scales without danger to the sentiments embodied, and can be well copied only by the appreciative and experienced artist; and to translate the poetry of painting into monochrome requires the best efforts of the art-gifted intellect. As thought should characterise our studies, so should its result characterise our productions. Conceptions of nature's excellences and beauties can no more be developed in the camera and dark room without mental agency than they can on the canvas and in the sculptor's studio; and all works of fine art must soon occupy one dead, stagnant level of mechanical perfection and contented mediocrity if the standard of its ambition be not an intellectual one. Our landscape photography bids fair to become peculiarly English in its already partially recognised superiority; and we certainly urge its very highest interest in bending ourselves earnestly to the cultivation of the moral and intellectual qualities of the art.

My next letter will turn to studies more closely associated with mechanical than with mental elements. Perhaps my fellow-students may think the former ought to have preceded the latter; but I have preferred working from the top downwards, because by so doing I hoped to awaken attention to the value of studies now first introduced publicly to the photographic world in these pages, and so have a better chance of making readers into students, and students the more ready to go on with me to the end. The first lessons of art should be those which teach us to appreciate art productions in all their various qualities of excellence; and the next should show to what these are due. These two lessons are now occupying our attention; but it is to be hoped that your camera and chemicals are not in the meantime idle, and that theory is progressing hand in hand with practice. ALFRED H. WALL.

Entremets.

AD ABSURDUM.

If you would learn the more wonderful discoveries of the age, and revel in those novel creations of art and science which soar highest in the ever-widening realms of the possible, and startle and amaze the most, go—not to those pages which profess to chronicle "the fairy tales of science and the long records" of Time's more marvellous achievements; not to royal and (if we may use the term) unroyal scientific societies; not to museums of science or offices of patents, or the studios of modern philosophy; but—to the advertising columns of our daily papers. In the same way, if you want to learn all that is most astounding and rare in the progress of photographic art there is nothing for it but to seek the same source. As to the photographic journals—bah!—why they are furlongs behind the advertisements. For instance, here are a few selections. In one we find a new process announced as "*removing from the surface of the picture all superfluous matter.*" In another, culled from the *Daily Telegraph*, we find a remarkable "*newly-invented apparatus*" which not only restores, or enlarges, or diminishes and improves "*faded and inferior photographs*," but *positively* also colours them in water or oil colours; and what is much, very much, more—MIRABILE DICTU!—absolutely does so—"*from descriptive particulars!!!*" How we should like to see this wonderful piece of apparatus, which of course understands all you say to it, and takes up the sable or lays down the hog-hair, or puts both aside for the copying camera, upon receiving the necessary "descriptive particulars." What will become of the colourists should this "newly-invented apparatus" be universally adopted? But even this apparatus must be doomed, for here is another startling discovery, announced in the advertisement sheet of a provincial paper:—

"NEW AND IMPORTANT DISCOVERY.—*Photographic portraits in their natural colours. The ——, established for the purpose of supplying the public with large-sized, highly-finished, everlasting family portraits in their natural colours. To be taken daily, and in the evening by the chemico-electrical light, in a style hitherto unequalled!*"

Another quotation from the advertisements of the Liverpool *Daily Post* informs us that at Messrs. S——— and F———'s "art and photographic studio" portraits are "*taken instantaneously,*" and, lest there should be any mistake about the matter, also states that instantaneous means about two or three seconds. In reply to Messrs. S——— and F——— a rival photographer delicately insinuates, through the same channel, that—

"It is a fact well known to scientific, professional, and amateur photographers that really instantaneous photographs can only be obtained under the favourably combined influences of sunlight and clear atmosphere; and no artist in England can fairly expect or promise to take portraits instantaneously in a glass gallery, even under the most favourable circumstances, especially at this time of the year.

"Mr. S———, not wishing to mislead his patrons and the public, does not profess to take portraits instantaneously, but guarantees to take photographs in from one-fourth to one-third of the usual time, by a judicious use of the salts of cadmium, and an extraordinary quick developing process."

And in reply to this side-wind of an attack Messrs. S——— and F——— return indignantly to the charge with—

"It is denied that INSTANTANEOUS PHOTOGRAPHS can be taken in England; but Messrs. S——— and F——— think it necessary to state that they can give at least one hundred references to most respectable families in town who will certify to the perfect truth of this announcement.

"The remarkable process by which these portraits are obtained is the last discovery of one of the most eminent French photographers of the day, who communicated it to Mr. F——— on his visiting Paris in the beginning of the present year for the purpose of acquainting himself with every progress in the art of photography."

But the remarkable process by which "instantaneous" pictures are produced in three seconds appears to have created so much attention that the rival who denied that really instantaneous photographs could be taken in this country at once proceeds to announce that—

"P. C. S——— has now fairly tested his salts of cadmium and quick developing process, and takes CARTES DE VISITE IN HALF A SECOND between Eleven and Two o'clock; and in from One to Five Seconds between Nine and Eleven and Two and Five o'clock; and in dull weather in double the above time."

On another occasion—with eyes distended and hands uplifted in an ecstacy of admiring wonder—comes a writer in the Liverpool *Daily Post*, saying in a loud voice:—"We have recorded in our columns, at different times, the achievements of our photographers, and have often had occasion to applaud their efforts; but an announcement by which we were startled a few days ago, and which opened up to our imagination a whole world of ideas, has proved to us that Liverpool has not yet shown us all it can do in this ever-increasing and improving branch of photography. The announcement to which we allude is that of 'instantaneous album portraits.' Fancy the charm of having your likeness taken whilst smiling, speaking, weeping, scolding even if you like; in fact, with any expression most suitable to your character or disposition, instead of the unavoidably sulky, staring, or squinting look which so often resulted from your being inexorably admonished to fasten your gaze *unwaveringly* and *unwinkingly* upon some particular object. What an indescribable blessing to be able to enter a room and sit comfortably down, or stand nonchalantly conversing with a friend, and before you have the slightest idea that the thing is even commenced to be told you are already taken! We have been shown some splendid specimens produced by this wonderful process, and must in all honesty declare that nothing can be finer as works of art, or more pleasing as a round and soft delineation of feature. We are convinced that when we state the artists to be Messrs. S——— and F——— we need add nothing in their praise, these gentlemen having won for themselves a reputation which is every day increasing." And so relapsing into a silent doze of happiness and content the dreamily imaginative writer contemplates the "whole world of ideas" embodied in the "indescribable blessing" of being photographed in three seconds! (We wonder how many such seconds go to minutes in the present state of actinic matters!) However, such of our readers as are anxious to emulate these Liverpool wonders are hereby informed that through the agency of our friend "Paul Pry" and his wonderful new "key-hole apparatus," *we* have discovered this grand secret of "one of the most eminent of the French photographers," who derived it from one of the most eminent of the *Laputan* photographers, and forthwith, and in these favoured pages, shall it be made public.

The *Laputans* are, in fact, the originators of all those miraculous discoveries to which we have herein referred. To these ingenious people we owe the secret of making books by machines—hence came the machine already described as the copying and colouring; and also the secret of softening marble to serve for pillows and pincushions; and, above all, the secret—since then of so much service to Laputan instantaneous photography—the secret of "the most eminent of the," &c.,—the secret of Messrs. ——, —the secret of—*extracting sun-beams from cucumbers!* The announcement of the methods to be adopted for performing this last feat, however, we reserve for its most recent discoverer, "Paul Pry, P.K.H.P.," as also that of its application to instantaneous photography. R. A. S.

[Since the above was written we have received a note from Paul Pry in which that gentleman declines to make public "the Laputan cucumber process," stating that he should very much prefer selling the secret for £80, to be raised by subscription, in which manner he hears that at least one other equally valuable discovery has been purchased by photographers. We shall be very happy to receive as many guineas as our readers may send us for this purpose.—R. A. S.]

THE PRINCE OF WALES.—We learn that Mr. Bedford took a photograph, while in Egypt, of the Prince's party, with the train of camels, &c., just after the ascent of the Great Pyramid.

Notes of the Month.

BEFORE these pages are in the hands of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY, the last "sending-in day" will be past, and photographers—like John Bunyan's Christian—be relieved of their burthen of sins, or contributions, good and bad, at the doors of that huge creation of Capt. Fowke, which, however abortive as an architectural essay, is imposing by virtue of those feelings which magnitude alone will always inspire. The total number of exhibitors in Class 14, Section II., is one hundred and sixty-five.

Mr. Philip H. Delamotte is engaged in illustrating the official catalogue.

Sir David Brewster has written a sketch of the history and progress of photography, which has appeared in the last number of the *North British Review*.

The exclusive privilege of taking photographic portraits at the International Exhibition has been put up for public competition by tender.

Mr. William Simpson has returned from India with a collection of water-colour drawings, photographs, and sketches of the scenery, architecture, and manners and customs of the people throughout Her Majesty's Eastern Empire.

At a Secret Committee of the Belgian Chamber of Representatives, a few days since, M. Doley proposed to grant certain indirect indemnities to the representatives. One was, that they should each have a card with a photographic portrait, which would give them a right to a free passage on all the railways in the country. No vote was come to on the matter.

The inclusion of photographs in the measure now before the House of Commons, called "The Copyright (Works of Art) Bill," is a public recognition of the status of the art so long contended for. Engravers and sculptors justly complain of that portion of the bill relating to them. We venture to hope that whatever is done will be done quickly, that this much-vexed question may be placed on some settled basis.

Kaulbach, the celebrated painter, of Munich, will be represented at the forthcoming Exhibition by his drawings illustrating the most remarkable subjects in the works of Goethe. These are very large but extremely highly-finished in chalk. It is complimentary to photography to know that, if the artist should decide not to send them, they will be seen by means of some admirable photographic *fac-similes* which have been taken of the actual size of the originals by M. Albert, of Munich, whose large photographs in full-length portraits are now attracting so much attention. S. T.

Messrs. Fothergill and Branfill have recently photographed five views in the superb city of Genoa. These, as specimens of photography, are said, by a writer in the *Athenæum*, to be as exquisitely clear, fine in tone, and sharp as can be desired, though it is questionable if the finest points of the city have been chosen either for picturesque effect or historical interest. The exception is the good representation of the famous *Pietà* of Michael Angelo that stands in the Allegro di Poveri. As memoranda of the present condition of the city in the localities represented these works will be acceptable to travellers.

The *fourth estate* will soon find it necessary to keep a registry of births, deaths, and marriages, if its members would preserve genealogy from getting confused. Every week or two ushers another bantling into the world. So frequently do they come it is a matter for wonder who is to keep them all. But some form happy or unhappy unions—as did the *Morning Star* and *Dial*—and others, one by one, retire from mortal view. Another little bark—the *Art-World*—has just been launched on the sea of literature, perhaps to founder soon on some hidden rock, or perhaps to float securely down the stream of time. Who knows? Do serials, like human beings, think all men mortal but themselves? It is with all, we fear,

> "Only our partial eye
> That lends a brighter sunbeam to the wave
> On which we launch our own adventurous bark."

The *Art-World* especially aims at making "photography" one prominent feature of its pages. We heartily rejoice at anything that helps to give photography a recognised *status*. It is the thing of all others most wanted. It is that which every photographer most earnestly desires. But at the same time we would beg to suggest that its conductors should strive for a greater degree of accuracy in their facts. In the first number, which contains in that department both an article and a review, there are statements which will excite a smile from some, and the last-named contains a downright untruth. We commend to them a more rigid censorship of the photographic part of their *venture*.

Scraps and Fragments.

HEAD OF JOHN THE BAPTIST.—This beautiful photographic art production of Mr. Rejlander has been enlarged by him, and reproduced in lithography: it is about to be published by Mr. James Wood, of George Street, Edinburgh.

PHOTOGRAPHY AND ETHNOLOGY.—The Russians have taken photographic portraits of the various inhabitants of the Steppes of the Oural, with a view to ethnological studies. One view gives a profile, and another a full face; and the subjects of the operation were shaved, so as to exhibit the true form and dimensions of the skull.—*Intellectual Observer*.

PHOTOGRAPHS OF LONDON CHURCHES.—We were under a misapprehension in reference to the very excellent photographs of some London Churches noticed in our report of the Photographic Society's meeting on the 4th March, page 113. It is not, as we had hoped, the intention of Mr. J. J. Cole to photograph a complete set of the Churches of London, but only a selection of the masterpieces of Sir Christopher Wren.

ST. PAUL'S.—We have been favoured by Mr. C. E. Elliott, of Aldermanbury Postern, with a stereograph of St. Paul's Cathedral, taken from the Surrey side of Southwark Bridge, as suggested in our critique of Mr. Valentine Blanchard's illustrations of the metropolis. It is an excellent photograph, quite equal to those before noticed, showing the venerable pile to advantage slightly veiled in a thin wreath of smoke; and affording a most convincing proof that photography *can* render atmospheric effects perfectly, for there is nothing of fogginess or indistinctness about it.

PHOTOGRAPHY ON THE ALPS.—Remarking upon the views of the Swiss Glaciers, lately produced by Messrs. Bisson Frères, M. Mc-A. Gaudin says:—"We can only with difficulty form an idea of the amount of trouble, fatigue, and care necessary in order to ensure views such as these. Sometimes it is requisite to spend *eight successive days in the snows*, without the power of doing anything, uselessly longing hour after hour for a simple effect of illumination." It is expected that the subjects to which allusion is made will figure in the International Exhibition. Amongst others, mention is made of a panorama of the *Mèr de Glace*, taken on three negatives, as being peculiarly fine.

CALUMNY.—The Solicitors of M. Silvy, have issued the following notice by advertisement in *The Times*:—"Reward, One Hundred Pounds.—Whereas, a calumny, of a nature most injurious to the character and reputation of Mons. Camille Silvy, of 33, Porchester-terrace, Bayswater, having been (for a short time past) extensively circulated in society, this is to give notice, that the said calumny is wholly and entirely false, without the slightest foundation, and that the above reward will be given to, or placed at the disposal of, any person or persons who will enable the said Mons. Camille Silvy to trace the said calumny to its source."

DERISION.—Will photographers endorse the sentiments of the following letter, which appeared lately in *The Times*?—"Not far from the truth.—To the Editor.—Sir,—I am told to understand that you go to ask our Emperor to open your Exhibition. I hope in charity you will bring him into the building blindfooled, and so he will save the miserable indignation we have suffered from looking at your horrid building. Hi! Hi! we mock ourselves at you when we see from the park the big Dome built on boards and half hid by the big shed. Oh the ugly brik and the frightful shed to call all Europe to see! Why you bost so much? If you only say we build the shed then no one laugh. Even the little boy, the guide, he say 'dam ugly.' I have, &c., JULES PIRER. Leicester-square, Hotel Sabionière."

LITERARY AND PHILOSOPHICAL SOCIETY, LIVERPOOL.—A Jubilee Soirée of this Society—one of the oldest literary associations in the country—took place in the magnificent suite of rooms in the Town Hall, Liverpool, on Thursday, the 15th ult. The company numbered about 1800. Mr. J. Moule had kindly furnished his patent photogen apparatus for the evening, and numerous very excellent photographs were taken by its aid by Mr. Keith, of Lord Street, Liverpool. As it was the first time that our art has been publicly practised at night in Liverpool, much interest was attached to the display, which, even under some adverse circumstances, was very successful. Rejlander's *Two Ways of Life* (of which the Publisher of this Journal possesses a magnificent copy, which was exhibited), a large portfolio of Mr. Rejlander's choicest photographic art-studies, an album (containing numerous choice specimens of photographic art) contributed by the Editor, together with various other unique productions of the camera, lent an additional charm to the otherwise large collection of works of art brought together on this interesting occasion.

Meetings of Societies.

MEETINGS IN APRIL.

1st.—London, and Liverpool.
2nd.—Manchester, Edinburgh, and Bradford.
3rd.—Glasgow.
4th.—Newcastle-on-Tyne.
8th.—Photographic Society of Scotland, and Birmingham.
10th.—S. London, and Chorlton.
16th.—Edinburgh, and North London.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A Committee Meeting was held on Thursday, the 20th ult., at 26, Haymarket, to select the prize pictures for the season 1861-2,—Sir Thomas Maryon Wilson, Bart., in the chair.

The minutes of the last meeting having been read and confirmed, and the principles upon which the prizes were to be awarded discussed, a certain number of the pictures, selected by the various members of the Committee as entitled to competition, were laid upon the table, and their several merits and qualifications descanted upon *without any of the members of the Committee knowing, until subsequent to the award, by whom the pictures were produced.* After much deliberation the following award was unanimously adopted. The selection occupied so much time that all further business was postponed until the following meeting.

AWARD OF THE PRIZES

By the Committee of The Amateur Photographic Association.

The Committee—being fully impressed with the responsibility attaching to the faithful discharge of the duty of selecting negatives to be distinguished for their superior excellence, by the award of prizes, in accordance with the intimation given in the prospectus issued at the time of the contemplated establishment of the Association—has examined proofs from every negative admitted by the referees, to the number of upwards of 1800, about 200 having been rejected.

The task of selection, though a pleasing one, involved no small amount of labour, extending over many hours for several days—a fact that it is necessary to record in order to account for a few days' delay in publishing the result arrived at.

The Committee very soon became impressed with the conviction that there was no lack of pictures possessing merit that might be appropriately recognised by conferring prizes upon their producers; but this, so far from facilitating the task of selection, materially enhanced the difficulty. Where so many are worthy it is not easy to determine which one is so in a pre-eminent degree.

One source of embarrassment that could scarcely have been foreseen, and therefore not provided against, arose in consequence of the fact that the number of pictures varying in dimensions from 9 by 7 inches to 10 by 8 inches, constituting Class B, formed an overwhelming majority over the other two classes of single pictures put together—that is to say, of pictures 12 by 10 inches and upwards, and of 8½ by 6½ inches and under, in dimensions; and it is somewhat singular that in Class B—that which is by far the most numerous—the standard of merit is also considerably higher than in the other classes. The occurrence of this circumstance involved the consideration whether it would be just to award the prize of the highest value to a picture that might be inferior to another merely because of its possessing a few more square inches of surface, and secondly whether it would be correct to make an alteration of the arrangement originally laid down. It was unanimously determined that it would be judicious upon a future occasion not to define too rigorously the special sizes of the pictures to which each prize should be confined, but to leave the judges more discretion upon this point; because, under the present arrangement, if too strictly interpreted, it would be possible in an extreme case for a work of mediocre character to receive a higher reward than one of surpassing excellence. It is true that greater latitude in the power of selection, untrammelled by considerations of sizes of the pictures, would still further complicate the question of choice, because, *cæteris paribus*, a large plate involves more skill in its production than a small one, and that it is intrinsically more valuable will not, it is presumed, be questioned. But it would be difficult to determine with certainty the exact amount of extra manipulative excellence that should be considered sufficient to elevate a smaller plate so as to render it equal in value to a larger one.

Before deciding upon the prize pictures it was needful to lay down certain principles by which the selection should be governed. As the chief end and object of photography may be regarded as for the purpose of diffusing the love of art, and at the same time of gratifying the taste encouraged, naturally the *artistic* quality of each production was deemed of the first importance; but, as the highest powers of art conception are of little value without the powers requisite for its appropriate expression, artistic excellence, if uncombined with manipulative skill, would be but of little account in a photograph. Perfect manipulation was therefore fixed upon as the second important point to be reckoned. Happily these two points have in the productions before the Committee come but rarely into competition.

Bearing the above-named principles in mind, it was soon discovered that, good as some of the productions in Class A undoubtedly were, they were surpassed by many in class B. It was further noticed that in class A, although it contained but a moderate number of pictures, the best of them were of a comparatively uniform average of merit. To meet these difficulties it was determined by the Committee, with the sanction of the Referees, to divide the twelve-guinea prize equally between three negatives which were deemed to possess equal claims to recognition—an arrangement which would leave the best picture, without regard to size, to receive the highest award. The productions named below were consequently adopted as the prize pictures, viz.:—

Class A.—Nos. $\frac{14}{15}$. *On the Teith, near Callander*, by W. Church, jun.
$\frac{7}{18}$. *Hoar Frost: a Park Scene*, by the Earl of Caithness.
$\frac{22}{13}$. *Corfu, from the Island of Vido*, by Major J. D. Shakspeare.

Instead of the Twelve Guinea Medal three smaller ones, of the value of Four Guineas each, to the respective producers of the above-named works.

The Seven Guinea Medal.

Class B.—No. $\frac{1}{18}$. *On the Banks of the Severn, near Winterdyne*, by Major Gresley.

The Five Guinea Medal.

Class C.—No. $\frac{20}{11}$. *Fishing Party on the Coquet, Cumberland*, by Henry St. Vincent Ames.

The Three Guinea Medal.

Class D.—No. $\frac{55}{23}$. *Floral Festoons in Nature's Garden*, by G. S. Penney.

It would be an act if not of injustice, certainly of remissness, on the part of the Committee were it to abstain altogether from honourable mention of some others of the contributions to the stock of negatives placed temporarily at the disposal of the Association; but there are so many of them which might with propriety enjoy that distinction, that it will be impossible to name more than a small selection therefrom without extending this notice to an inordinate length.

Besides that by Major Gresley on which a prize has already been conferred, the one numbered $\frac{1}{7}$ is perhaps, if possible, even more artistic in selection of subject, but not quite so perfect in execution. $\frac{1}{2}$ and $\frac{1}{4}$ are also particularly worthy of commendation; and indeed the whole of this gentleman's contributions display the work of a true artist.

Mr. A. C. Ainslie's, No. $\frac{10}{9}$, is very artistically rendered, exhibiting a field-gate in the shade of a handsome tree; and scarcely less so are *The Gate of Corfe Church*, Somerset, $\frac{10}{4}$; *The Grove at Barton Grange*, $\frac{10}{1}$; and *The Waterwheel at Corfe*, $\frac{10}{6}$.

Mr. W. Prideaux's *Fishing House*, $\frac{1}{4}$, is a photographic gem.

Mr. E. Edward's *Cleft in the Rock*, near Aucher Church, Derby, $\frac{8}{8}$, elicited much admiration; as also his *Cloisters at Netley Abbey*, $\frac{8}{6}$, and many of his views in the *Isle of Wight*.

Captain Plaiffin's *Arab Girl Sitting by the Wayside*, $\frac{18}{10}$, is a highly-interesting figure subject, admirably treated; and his landscapes, $\frac{18}{2}$ and $\frac{18}{3}$, are deserving of especial notice.

Mr. R. C. Grice's *Market Woman at Aix la Chapelle*, $\frac{13}{14}$, is a good companion to Captain Plaiffin's *Arab Girl*. These belong to a class of subject that offers much scope for photographic illustration.

Lieut. J. A. Papillon's Chinese illustrations are unusually interesting—some, exhibiting the garden scenes, pre-eminently so.

Lieut.-Colonel Verschoyle has contributed many valuable negatives. *The Cheddar Cliffs*, $\frac{11}{39}$, and *Pier at Lynmouth*, $\frac{11}{48}$, are excellent.

Mr. Ebbage's *Kenilworth*, $\frac{1}{2}$, and scenes at and near Warwick;

The Earl of Caithness's *Avenue at Weston*, $\frac{7}{8}$;

Mr. D. C. Brown's *Scenes at Warkworth*, $\frac{6}{7}$ and $\frac{6}{2}$;

Mr. H. Whitfield's *Vale of Neath*, $\frac{6}{7}$ and $\frac{6}{3}$;

Mr. J. A. C. Branfill's *Pont Aberglaslyn*, $\frac{16}{2}$, and *Pass of Llanberris*, $\frac{16}{5}$;—all elicited much admiration, as well as many of the subjects by Major Russell, and medical ones by Dr. Budd. The stereographic subjects are also many of them considered very fine.

In conclusion, the Committee congratulates the members upon the discovery and utilisation of so many valuable negatives, of which but an insignificant fraction is indicated in the above list.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The Annual Meeting of this Society was held at eight o'clock on Wednesday Evening, the 19th ult., at Myddleton Hall, Upper Street, Islington,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were elected members of the Society:—Messrs. J. Homersham, W. Spicer, R. P. Jones,—Toulmin, and D. Hornby.

The Secretary, at the request of the Chairman, then read the following

ANNUAL REPORT.

In addressing you on the Fifth Anniversary of the North London Photographic Association your Committee has little but congratulations to offer.

The success of the Association has been steady and progressive. The number of its members exceeds one hundred, and there are this evening several new names for election. The meetings have been well attended; the papers read have elicited more than ordinary interest; and the discussions have been conducted with greater freedom, ability, and energy—all tending to demonstrate the progress of our art and the social feeling pervading our Society.

The financial statement is satisfactory, showing a balance more than sufficient to defray all the liabilities of the Association.

Your Committee regrets the unavoidable delay in the distribution of the presentation photograph, but rests assured there will be ample compensation in the size and beauty of the picture; and your Committee takes this opportunity

of thanking Mr. Bedford for his liberality in supplying so superior a photograph at a mere nominal cost to the Association.

Your Committee will be happy to receive contributions of unmounted photographs towards the completion of the first volume of the "Album" for circulation among the members, and begs leave to tender its best thanks to Mr. Bourne and other gentlemen who have already kindly presented specimens to the "folio."

Arrangements have been made by your Commitee to provide at least one paper to be read at each meeting; and will, when practicable, announce its subject at the previous meeting, that members may come prepared to enter more largely into the discussions which invariably ensue, and which will tend to render the ordinary meetings even more attractive than at present.

The attendance of members of other Societies has been large; and your Committee will esteem it a privilege at all times to welcome those who, although not subscribers to the funds of this Association, come forward to aid by their presence and information the progress of photographic art.

Your Committee, in resigning office, is happy to state that its duties have been both light and agreeable. The readiness evinced by the members to communicate information, and the exceedingly pleasant tone pervading the discussions, have rendered the recurrence of the meetings a source of pleasure, and your Committee trusts that a state of affairs so satisfactory may long be characteristic of this Association.

Dr. TREASURER IN ACCOUNT WITH THE NORTH LONDON PHOTOGRAPHIC ASSOCIATION. *Cr.*

Balance from last year	£11	10	6	Journals, Rent, Stationery, Printing, &c.	£36	2	3
Subscriptions	50	18	6	Balance 19th March	26	6	9
	£62	9	0		£62	9	0
Balance	£26	6	9				

MARCH 19, 1862. D. W. HILL.

We have this day examined the Treasurer's accounts, with the balance sheet, and find the same to be correct.

W. HISLOP, E. W. FOXLEE, } AUDITORS.

The Report and the statement of accounts were received with expressions of the highest satisfaction by the members, and it was moved by Mr. Hislop, and seconded by Mr. Goslett, that they be adopted. The motion was carried *nem. dis.*

The CHAIRMAN stated that Mr. Hughes had at the last meeting given notice of his intention to move that Rule 5 of the Society be altered, so as to admit of the election of two Vice-Presidents. He (the Chairman) heartily concurred in the proposition, as he thought it not a mere matter of ornament but one of utility that two gentlemen should be elected to hold office as Vice-Presidents. Perhaps, as Mr. Hughes was unfortunately absent, some gentleman would put the motion to the meeting.

It was moved by Mr. SIMPSON, and seconded by Mr. MOENS, that Rule 5 be altered in accordance with Mr. Hughes's proposition, as stated to the meeting by the Chairman.

This motion was also carried unanimously.

Messrs. Martin and Goslett having been appointed scrutineers, the election of officers then proceeded, and resulted as follows:—

President—Charles Woodward, Esq., F.R.S., &c.

Vice-Presidents—George Shadbolt, Esq.; George Dawson, Esq.

Treasurer—D. W. Hill, Esq.

Honorary Secretary—John Barnett, Esq.

Committee—Messrs. F. Bedford, C. J. Moens, G. W. Simpson, W. Hislop, T. Ross, T. A. Barber, D. Bingham, and E. W. Foxlee.

On the motion of Mr. HISLOP, seconded by Mr. FOXLEE, a hearty vote of thanks was accorded to the Vice-President, Treasurer, Secretary, and Committee for the efficient manner in which they had conducted the business of the Society during the past year.

The motion was carried by acclamation.

Mr. Martin exhibited a "Fothergill" plate upon which an impression had been taken after the plate had been prepared for *two years*.

The TREASURER announced that the presentation print—subject, *The Beach at Ilfracombe*, by Mr. F. Bedford—was now ready for delivery. Members who were present could take their copies home with them. He could not forbear calling attention to the very beautiful way in which the whole of the copies were printed—not a single faulty or mealy-looking one amongst them; in fact each was a *fac-simile* of the others, their uniformity of excellence being something marvellous.

The formal business of the meeting having been concluded, the CHAIRMAN announced that Mr. England had very kindly undertaken to exhibit his instantaneous views of Paris and America, illuminated by a mixture of ordinary coal gas and oxygen.

The most interesting facts in connexion with these photographs will be found noticed at page 113. Mr. England modified his method of showing the pictures on this occasion by first using the lenses of the lantern in the same way as at King's College on the 4th instant, and then by removing the non-achromatic lenses and replacing them by an ordinary quarter-plate double achromatic combination. Although the picture produced (at the same distance from the screen) was smaller, the absence of distortion at the edges and increase of sharpness in the details of the picture were so marked as to elicit warm expressions of approbation from the members.

Mr. HISLOP said he had exhibited pictures of the same size with a similar effective arrangement of lenses, illuminated, however, by an ordinary paraffine lamp, which he found amply sufficient for the purpose.

A vote of thanks was passed to Mr. England for his great kindness in exhibiting so interesting a series of photographs.

The meeting was then adjourned.

NOTICE.

In consequence of the 23rd instant having been fixed for the *soirée* of the Microscopical Society, to be held at King's College, at which many of the members of this Society will be present, the next meeting of the North London Photographic Association has been arranged to be held on the 16*th instant*, when a paper *On Micro-Photography* will be read.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of this Society was held at the City of London College (late Sussex Hall), Leadenhall Street, on Thursday evening, 13th ult.,—G. Wharton Simpson, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen, proposed by Messrs. Simpson, Martin, and Davis, were elected members of the Society:—Messrs. T. Mills, C. T. Newcombe, Thos. Lloydd, P. Cawston, Edgar Brock, and Fred. Fitch.

The CHAIRMAN suggested that in the absence of Mr. Blanchard, who was to have opened the adjourned discussion on Mr. Davis's paper read at the last meeting, it would be advisable, though not perhaps strictly in order, to ask Mr. Fitch to read his paper first. He would, however, before that ask the Secretary to read some particulars relative to the South London Society's Exhibition of British and Foreign Photography.

The SECRETARY then read the following statement:—

THE Committee of the South London Photographic Society have great pleasure in announcing that they have made arrangements with the Directors of the Crystal Palace Company for holding at Sydenham, during the current year, an Exhibition of British and Foreign Photography. The Company have placed at the command of the Committee an eligible and well-lighted portion of the Palace, and they are, therefore, desirous of holding such an exposition of photographic art and science as shall worthily illustrate the present vast development of this great modern discovery. They are inclined to conceive that, at the present period, photographers are especially interested in exemplifying to the world the high artistic standard to which their works have attained, as well as the more freely acknowledged practical character of its results. In the International Exhibition of 1862 the spirit of emulation will be mainly directed to a friendly recognition of the comparative progress made by photographers of different nations, and the limited space at the disposal of the Commissioners will be awarded accordingly. At the Sydenham International Exhibition, upon the other hand, the leading design will be the promotion of the progress of photography itself, to be attained by an exposition of its most artistic specimens, a popular illustration of the scientific principles involved in their production, and a display of the varied and highly ingenious philosophical apparatus which have been employed in the attainment.

The Committee of the South London Photographic Society in inviting, therefore, your hearty co-operation in furtherance of the success of the Exhibition, beg to draw your attention to the appended regulations with the least possible delay.

RULES FOR EXHIBITORS.

The South London Society's Exhibition of British and Foreign Photography, to be held at the Crystal Palace, Sydenham, will be opened on or about the 15th of May, 1862, and will continue for a period not exceeding six, or less than three months.

All pictures intended for the Exhibition must be framed, glazed, and mounted, with a suitable margin. The names of the subject, process, and artist, must be written legibly at the back of each picture, together with any especial observations, to be inserted in the catalogue.

Photographs for exhibition must be delivered free of charge on or before the 1st of May at the Palace; each package to be addressed as follows:—

GEORGE GROVE, Esq.,
South London Photographic Exhibition,
Crystal Palace,
Sydenham.

*From (Name)*_____
*(Address*_____

Carriage Paid.

The cost of the return carriage, and all risk of breakage or injury to the pictures or frames, will have to be sustained by the exhibitors; every reasonable care will, however, be exercised, in order to prevent the occurrence of damage.

The Directors of the Crystal Palace Company will present to each exhibitor, upon the recommendation of the Committee, a season ticket available for six months, to be applied for to the Secretary of the South London Photographic Society.

The Committee of the South London Photographic Society, having entered into an arrangement with the Directors of the Crystal Palace Company to exclude all photographs unworthy of public exhibition, reserve to themselves the right of selection.

Coloured photographs will be admissible only when accompanied in the same frame with untouched specimens. This regulation will be strictly adhered to in every instance.

An adjoining but separate gallery will be appropriated to the reception of pictures, &c., illustrating the principles or history of photography, and the exhibition of apparatus. Cases for the protection of optical and philosophical instruments will have to be provided by the exhibitors.

The prices of copies of pictures exhibited intended for sale should be forwarded to the Secretary, so that they may be described accordingly in the catalogue kept in the gallery for the purpose. A commission of 20 per cent. will be charged upon all sales effected.

ALFRED H. WALL, *Hon. Secretary.*

Mr. NOEL E. FITCH then read his amusing and interesting paper, *Recollections of an Amateur Photographer in Portraiture.* [See page 103.]

The CHAIRMAN having directed attention to the very superior quality of the photographs (portraits and copies of engravings) with which Mr. Fitch had illustrated his paper, an animated though somewhat desultory conversation ensued on the amount of top-light which it was necessary to cut off in order to secure a good effect.

Mr. FITCH said he had two feet six inches over the head of his sitters absolutely opaque, while six feet of the glass roof in advance of that were stippled in order to admit a diffused light.

Mr. HOWARD had great pleasure in contributing his testimony in favour of the varnish used and recommended by Mr. Fitch. White hard varnish could be obtained at a moment's notice from the oil shop, and, being diluted with methylated spirit, was ready for use. He had found it stand almost any amount of solar heat in the pressure-frame, and it was also extremely hard. He (Mr. Howard) thought it no disadvantage that heat

was necessary to its successful application, as he had observed that many of the varnishes applied without heat became soft and tacky under the influence of the sun's rays.

Mr. Wall felt great pleasure in corroborating the statements of Mr. Fitch and Mr Howard on the subject of varnish.

The Chairman said, without exactly remembering the proportions, that white hard varnish was composed of lac, sandarach, and copal. He had observed that those varnishes which did not require heat at the time of applying them were generally very soft, brittle, and readily affected by solar heat.

Mr. Martin, sharing in the general admiration of the highly-successful copies of engravings exhibited by Mr. Fitch, asked that gentleman to favour the meeting with some details as to the method followed in their production.

Mr. Fitch, in reply, stated that the materials and manipulation were the same throughout as he had used for portraiture, the only difference being that he placed the print in full sunshine, which, notwithstanding that the object was so near the lens, he found to diminish the time of exposure considerably.

Mr. Davis thought that in the early part of the day it was very well to have the sitter facing the south, but not so when the sun was high in the meridian.

Mr. Wall intimated that the angle at which the light falls was determinable by the direction of the shadows on the face.

Mr. Howard, without desiring for a moment to detract from the high merit of Mr. Fitch's productions, must observe that every amateur was not so favourably situated as that gentleman. He (Mr. Howard), though devoted principally to dry collodion photography, had occasionally attempted the taking of portraits without a glass room, and the difficulties under which he laboured were such as to render success almost impossible. He might mention that he had on some occasions hung up his background, carefully posed his sitter, and retired to his dark room for the sensitive plate. On emerging with it he had had the pleasure of discovering his sitter actively engaged in supporting the background, blown down, in the meantime, by the wind. Ladies, too, he found it almost impossible to keep in position, as there was always some final touch required to ribbon or ornament; or perhaps a slight shower of rain had come on during his absence in the dark room, and on his reappearing the *lady-bird* had flown.

Mr. Harman thought it unnecessary to add silver to the developing solution: if pictures produced by iron development were hard, it generally arose from carrying the development too far. He (Mr. Harman) thought the advantage of iron developers was that they admitted of shorter exposure, whereby a more agreeable expression was secured.

The Chairman thought that Mr. Fitch, in saying that he used an iron developer in dull weather, was admitting by implication the superior energy of iron as a developing agent.

Mr. Fitch said he believed that if pyrogallic developers were properly mixed they would be found as energetic as iron: too much acid was generally added to retard its action. He could not say the proportions, as he usually mixed the ingredients until he found them work well. In reply to a question from Mr. Davis, Mr. Fitch further remarked that in toning he added carbonate of soda to the chloride of gold until effervescence ceased: he was careful to wash for two hours and sponge before toning, and maintained his toning bath at a temperature of 65° Fah. In washing he used five or six changes of water, being of opinion that the object in printing should be the permanent retention of the prints in all their pristine beauty.

Mr. Howard thought there was now good evidence in favour of the effectiveness of the alkaline method of toning. It had been in use nearly three years, and the prints produced by its means were not yellow; moreover the prints sold in the shops possessed an uniform and superior excellence compared to those on sale some three or four years back.

The Chairman then announced that, in the absence of Mr. Blanchard, Mr. Lane would open the adjourned discussion on Mr. Davis's paper.

Mr. Lane said he doubted if the point of view from which he regarded the manufacture of pyroxyline was one immediately connected with the objects of that Society. He was a civil engineer, and he would be glad to know if, by attention to the details of manufacture, it would be possible to obtain the explosive variety in a form possessing greater constancy of character? His object was to apply it to the purposes of tunnelling, as it possessed great advantages over common powder for that purpose. In using the latter article so many gaseous products were generated by the explosion that an hour and a-half sometimes elapsed before the men could resume their labours in the tunnel. Nothing like that time was required when gun-cotton was employed for blasting. But the great drawback was this: he (Mr. Lane) had experimented with two charges done up for him by Messrs. Hall, the eminent gunpowder makers; one charge was unnecessarily violent in its action, and the other produced scarcely any effect. It would thus be seen that no reliance could be placed on the article supplied in commerce as gun-cotton. Messrs. Hall had about £100 worth of the article sunk in the river which flowed near their factory, and he (Mr. Lane) was sure they would be glad to learn of some means whereby they could render it commercially available.

Mr. Harman suggested that the same pains were not bestowed on the preparation of explosive as of soluble cotton.

The Chairman added that if as much time and attention were given to the details of manipulation in the one case as in the other, explosive cotton could hardly be supplied at a price suitable for the purpose to which Mr. Lane had alluded. The experience of photographers went to show that the best pyroxyline was obtained when operating on small quantities.

Mr. Davis reminded the meeting that he had recommended in his paper that not more than 100 grains of cotton should be operated upon at a time.

Mr. Lane said he had experimented with gun-cotton sixteen years ago, and, having heard that the Austrians had adopted it for their small arms and rifled ordnance, he thought that some marked improvement had been attained in its manufacture.

Some remarks were then made in reference to some verbal errors in Mr. Davis's paper, which, if they had not been corrected in the journals, were so self-evident that the readers would naturally make the correction. For instance, three volumes of iodising compound were ordered to one volume of collodion: the proportion should of course be reversed.

The Chairman directed attention to the fact that pyroxyline made with a larger proportion of water than was usually ordered yielded a collodion possessing a milky opalescent appearance, and which always yielded a negative of great intensity.

Mr. Davis entirely agreed with the remarks made by the Chairman. He (Mr. Davis) had from the first advocated less water than Mr. Hardwich. He had found no advantage accrue from the use of a large proportion of bromides in collodion. The true use of bromides might be illustrated by comparing the pictures obtained when they were introduced with those obtained by collodion containing iodide of potassium alone. In the latter case there would be found great extremes of light and shade, while in the former there would be found a softness in the middle tints, and sufficient exposure might be given without losing vigour.

Mr. Harman had observed, in developing with pyrogallic acid, that it was not necessary the collodion should contain a bromide; but, when iron salts were employed as developing agents, the introduction of a bromide became advisable.

Mr. Davis entertained similar views, and had observed that a collodion containing all bromide of cadmium was much slower than when simply iodised.

The Chairman had noticed that with bromide alone four times the exposure was necessary than when the collodion contained four grains of iodide of potassium and one grain of bromide.

Mr. Davis thought the direction in which photographers should advance was that of aiming to communicate greater sensibility to collodion.

A somewhat desultory discussion then took place on the various causes of streaks on the plate and the methods of avoiding them, Mr. Fitch expressing it as his opinion that when the bath had that property inherent in it, any remedy short of a new one would be found unavailing.

The meeting was then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society held its usual fortnightly meeting on the evening of the 19th ult. R. H. Bow, Esq., Vice-President, occupied the chair.

A paper, entitled *Hints on the Nature of Pictorial Beauty and the Principles of Composition*, Part II., was read by Mr. W. H. Davies. [We are reluctantly compelled to leave over Mr. Davies's paper till our next number.]

When the reading of the paper was concluded,

Mr. Horsburgh stated that there was one great difficulty in carrying out the suggestions of Mr. Davies: it was that of getting all the subjects in sharp focus when they were arranged for the best pictorial effect.

Mr. Davies thought this difficulty was easily overcome, and pointed out a group of fifteen or sixteen gentlemen, taken by Mr. Tunny, all of whom were in perfect focus, although situated at varying distances from the camera.

Mr. Horsburgh said that in this case Mr. Tunny had the advantage of operating in the open air, admitting of his removing the camera to a greater distance; and, besides, he believed Mr. Tunny took his groups with a single-view lens, which secured greater depth of focus. He also thought it would be very desirable that the glass-houses of photographers were much larger than many of them are, to enable groups to be more artistically arranged.

A Member stated that the group by Mr. Tunny just alluded to had been taken by a Voigtlander orthoscopic lens, that being the lens Mr. Tunny preferred for such pictures.

The rest of the evening was spent in practical lessons in grouping, some artists who were present kindly arranging groups of two, three, and upwards, explaining at the same time the principles of composition involved, and further elucidating the points embraced in the paper.

The cordial thanks of the members were awarded to these gentlemen, as also to Mr. Davies for his paper.

MICROSCOPICAL SOCIETY.

The ordinary general meeting of the above Society was held in King's College, London, on Wednesday evening, March 12, 1862,—Mr. Farrants, President, in the chair.

The minutes of the preceding meeting were duly read and confirmed.

Dr. Guy read a paper *On the Preservation and Mounting of Objects in Capillary Tubes*, and exhibited several interesting objects, among which were some globular crystals of arsenite of zinc.

The thanks of the Society were awarded to Dr. Guy.

Mr. Richard Beck read a paper *On the Scales of the Podura and Some Allied Insects*, and illustrated his subject with numerous large diagrams from magnified drawings, obtained by using the camera lucida attached to the eye-piece of the microscope. He also presented seven slides to the Society.

Mr. Charles Brooke heard with great pleasure the account given by Mr. R. Beck of the result of his studies of the scales of the exceedingly interesting insect, the podura. The structure of the scales had been a bone of contention, and numerous modes of separating the scale for

viewing them had been described. Mr. Bowerbank pursued the plan of crushing the insects gently between two pieces of glass, so as not to cause the exudation of the juices of the insect, and yet obtain an adherence of the scales. There was one mode of proceeding which he (Mr. Brooke) had practised many years since, and which, he believed, had never appeared in print, viz., he placed a live podura upon a slide with a little test tube over it, upon which the insect began to hop on the slide, and continued to hop until tired. In the hopping process he deposited scales upon the glass slide, and falling and treading upon them partially obliterated the markings. He had many slides in his possession, by which it was palpable that each so-called scale was an uniform membrane: they were, in fact, epithelium plates with an imbricated structure, about in length and breadth like a number of rows of fingers placed one over the other, invariably exhibiting a flat form and not the tubular form exhibited by Mr. Beck. The appearance of the tubular form was an illusion consequent upon a peculiar illumination. In some of the podura scales which he (Mr. Brooke) had procured, and which had evidently been trodden upon by the insect itself, there was the selfsame obliteration of markings which Mr. Beck had depicted in his diagrams, and singularly enough attributed to moisture. There was occasionally a single plate standing out by itself, and others rubbed off—in some cases a considerable portion presenting the appearance of a smooth transparent membrane, having no markings. Wherever there was a single plate standing out it was always exactly parallel to the others. If they were taken, as he (Mr. Brooke) believed them to be, somewhat of the shape of the finger, the appearance of white light described in Mr. Beck's diagrams, would be the effect of light passing through a transparent cylinder, terminating with a round end like the shape of a finger, and that appearance would be the natural appearance of that structure—a fact remarkably easy of verification by the preparation of slides in the way he (Mr. Brooke) had described. He had many years ago examined podura scales under a twelfth objective, as opaque objects, and found that when they were turned under side up they had a perfectly smooth appearance; but whenever they were turned outside uppermost, they had the markings which, he contended, proved them to be longitudinal epithelium plates with an imbricated structure.

The thanks of the Society were awarded to Mr. Richard Beck.

The Chairman then announced that the Committee for the purchase of books at the sale of the late Professor Quekett's effects had, in purchasing some desirable lots, been obliged to purchase several works, copies of which were already in the library of the Society.

The works alluded to were then put up, *seriatim*, for competition among the members, and elicited a lively exhibition of acquisitiveness which contrasted with the usual grave demeanour exhibited at the meetings of this Society.

The following circular was distributed amongst the members:—

"Quekett Memorial Medal Fund.—The Council of the Microscopical Society of London, desirous of testifying their esteem for the late Professor Quekett, and to commemorate the value of his services rendered to the Society for nearly twenty years, have resolved to raise a fund, the interest of which, after payment of the books and instruments purchased for the Society at the late Professor Quekett's sale, shall be devoted to the purchase of a Medal, to be called the '*Quekett Medal*,' and to be given at the discretion of the Council (if possible annually) to such member of the Society who, in the opinion of the Council, has best promoted the interest of microscopical science.

"Gentlemen interested in the above scheme are invited to forward their subscriptions to the Treasurer, or to the Regent Street Branch of the Union Bank of London, on the account of the Quekett Medal Memorial."

A list of subscriptions to the amount of above £100 was appended.

Foreign Correspondence.

Paris, March 27th, 1862.

Mr. Warren De la Rue having forwarded to the Academy of Sciences the photographic pictures and designs executed under his direction on the occasion of the eclipse of the 18th of July, 1860, M. Faye (one of the first and most urgent in recommending the application of photography to such observations) has just presented to the Academy an interesting report thereon. He insists upon the importance of an idea suggested by your talented fellow-countryman, and which would give an additional value to the reproductions in question.

The distance of the planets is so great that they always appear completely flat. It would be impossible to apply to them the usual stereoscopic process; for, even by placing oneself at two opposite extremities of the earth, the angle obtained would be insufficient. Instead of varying the point of view, Mr. De la Rue varies the instant of observation. In this manner it is the object itself which changes place and not the apparatus. Two images of Mars obtained at two hours' interval correspond, for that planet, to a rotation of about thirty degrees. It is as if the photographer had made so much of the circuit round the planet in order to obtain the two photographic images. When placed in the stereoscope the two images produce a very striking effect, of which I was enabled to judge the other evening, as two copies had been presented to the French Society of Photography.

At the same meeting (Friday, the 21st), the President read the report of the Committee charged with the awarding of the prize for carbon printing processes, which had been offered by the Duc de Luynes. The whole prize (2000 francs) was adjudged to M. Poitevin. The committee proposed, however, that a medal of 600 francs should be given to M. Fargier out of the funds of the Society, for the modification introduced by him into the original processes.

A numerous collection of views, groups, and types was presented on the same evening. These had been taken in Nova Zembla, by a French missionary, Father Gavet. They are far from being perfect in execution; but the wonder is that they could be taken at all in such a climate, and in a country where a journey of 400 leagues is necessary to procure the most indispensable substances. As to their subjects these pictures are interesting.

M. Mathieu Plessy recommends a two-per-cent. bath of acetate of soda for positive pictures before toning them with gold salt.

A staff officer, M. Champlonis, who was in the Syrian expedition, brought back some views which he had taken on what he calls *wet-dry waxed paper*. When he has sensitised his paper, he puts it wet between two sheets of blotting paper, taking care to place first in a double sheet of white paper. In this manner the prepared paper is maintained in a certain degree of humidity, which is advantageous in a warm country. Before developing he again puts the sheet into the aceto-nitrate bath.

M. Hermann Khrow recommends that a small quantity of hypochlorite of lime should be added to the chloride of calcium which is put into the apparatus for keeping waxed paper. The same gentleman gives an account of an experiment he has made. He has sensitised paper by placing it upon a bath of nitrate of uranium, in the proportion of one part of nitrate to seven parts water. His paper was still good after a year, He had to prolong the exposure, and to develop with alcoholised nitrate of silver.

M. Potteau—whom I have already had occasion to mention in speaking of the collection of types of the human race, which he has continued with perseverance—has just presented to the Academy of Sciences a new and curious reproduction. It is a copy of the bones of the paw of a *Plesiosaurus*, which were found, separated, in the environs of Havre. M. Valenciennes—your scientific men are so wondrously patient!—succeeded in reconstructing with these bones almost the entire *hand* of the gigantic *Saurian*. M. Potteau has reproduced the specimen very skilfully, and with that mathematical precision which scientific subjects demand.

At the late Photographic Exhibition in the Champs Elysées the fine pictures sent by M. Albert, of Munich, attracted much attention. They were large portraits and ravishing copies of drawings by Kaulbach. It appears that during his stay at Munich the Prince of Wales *posed* at this artist's studio for a natural-sized portrait, which is to figure at the Universal Exhibition. M. Albert makes use of the amplifying process with convergent light, and employs Woodward's camera. He operates upon iodide of silver, and develops with gallic acid.

Some time ago there died a M. Sarvageot, who was celebrated for having made a choice and immensely valuable collection of artistic curiosities. During his lifetime, even, he had offered it to the Louvre Museum, on condition that he should remain its curator, as he wished to enjoy to the end of his days the pleasure of contemplating and caring for his beloved rarities. The *Administration* is at present having the museum engraved in its entirety. To secure greater accuracy, the artist charged with this important work has decided to employ the heliographic process of M. Niépce de St. Victor. It will be one of the most important works which photography has aided to produce. ERNEST LACAN.

Philadelphia, March 8, 1862.

Could I but find the means of writing with a dry pen and dry ink, I might hope to do justice to the dry fever now raging in our midst. This fever has been in existence for some time past; but it seems to have only become fully developed since the publication of Dr. Draper's process of treating tannin plates.

In my last letter I made brief allusion to this process, but could not then say with how much favour it had been received, and even now the accounts reaching us are of a very contradictory nature. The majority, however, seem to endorse it; and only yesterday I was assured by a very reliable amateur that he had exposed two tannin plates prepared at the same time, giving one three minutes' exposure, and the other only five seconds', the light being the same in both cases. The first was developed as usual, but was undertoned, while the five seconds' exposure yielded, when treated with cold developer on the hot plate, an excellent negative. This is all very remarkable, and may lead to good results. Certain it is that if a

developer with the silver in it was heated to 200°, the silver would be thrown down before it could be put upon the plate; but, by heating the plate to 200°, and heating the developer to about 90°, and pouring as little as possible on the hot plate, a violent reaction must take place, and all the good effects of a very hot developer be produced.

It would not, perhaps, be admissible for me in my communications to you to express my own opinions on photographic formulæ, only so far as I endorse some generally-expressed sentiment;* and in the present case I must say that very many intelligent amateurs are free to confess that while Dr. Draper's way of developing is a great boon, yet it does not go to the bottom of the matter. The tannin process is in high favour, but they think it is far from being all that is wanted, and even with this hot development does not fulfil all the requirements of a rapid dry process. They seem to think that a dry plate quite free from nitrate of silver can never be a quick plate. Hence they look with favour on any preservative material that will yield them a film in nature the same as when wet. Some of Dr. Hill Norris's instantaneous dry plates have been experimented with by various operators, and they seem to consider them still as very far ahead of any dry plate yet produced. Mr. George Quincy Thorndike sent me three of them last week, and a rare treat it was to develop them.

While giving the ideas and opinions of amateurs on the dry-plate subject, let me give their sentiments on the international exchange of prints. Mr. Robert Shriver, of Maryland, close to the borders of "Dixie's Land," and within ear-shot of the Southern war, writes that if this international exchange is to be a "free fight," please to count him in. His views among the Cumberland mountains and on the Potomac river are very, very beautiful; and I have near me now a cattle scene, the cows standing in clear water, with a background of high rocks and a foreground of a pebbly beach: it is one of his gems. He works with the wet process exclusively, and seems to think no dry process capable of giving him such charming gradations of tone as the wet always gives. I have authority, too, to add the name of Mr. F. F. Thompson to the list of those willing to exchange. Both the gentlemen above named are very prompt, and are enthusiastic amateurs, and I enclose their addresses.

In regard to printing and toning albumen paper, I have to corroborate my former statement in regard to the very general use of a bath of ammonio-nitrate of silver with ether for sensitising albumenised paper; but, as a general thing, the amount of the sixty or eighty-grain solution converted into ammonio-nitrate is not more than one-third of the whole bulk. There are very many kinds of toning-baths used, but still the simple solution of chloride of gold, made very slightly alkaline with bicarbonate of soda, is the one most in vogue. Some, however, are adding chloride of uranium with marked success; but two prints now before me, from Farris's gallery, on Broadway—remarkable for the artistic pose of the figures—are of a very rich black tone, and have been treated with an alkaline citrate of soda in a hot bath, very similar to that which Mr. Hardwich has always recommended. I cannot refrain from saying a word or two about these same prints: they are card pictures of two children, the elder perhaps ten years and the younger not more than five—both of them beautiful girls, and full of animation. The youngest is leaning forward over a pedestal, which is partially hid by the folds of a curtain; there is a look of earnest wonder on her bright face, and her plump hands, so full of dimples like her cheeks, are a little crossed, so as to hide the ribbon by which is suspended her hat and plume. The background is dark but plain: there is no object to attract the attention from the interesting, wondering face. I asked Mr. Peale, who arranges the sitters and attends to the artistic part of the gallery, how such a happy hit had been made. "Oh!" he exclaimed, "she was a wild little elf; but I held her attention by a bold feat of prestidigitation: I kept her still ten seconds while I *swallowed the focussing cloth!*" He then told me that he had been spending some weeks in the camps near Washington, and had done a large business among the soldiers—making photographs a little larger than the usual card size, so as to be enclosed in commercial envelopes. He says that his sleight of hand did not fail him even among horses, and he had obtained many good equestrian pictures by inviting the attention of the animal to a small wooden box in which he had oats, and which he could so shake as to produce a sound like throwing corn into a feed trough. I give these two instances as useful hints to the unfortunate operators who have to photograph babies and horses. Speaking of card pictures, the best are now being taken with half-size lenses, in place of the quarter-size heretofore used, with much increased sharpness and depth; and I think the taste for elaborate backgrounds is on the decline, most persons preferring the plain screens to fancy ones.

There has been much controversy going on as to what is the best way of strengthening a negative, some claiming that with good collodion there is no need of resorting to strengtheners. But still they are used by nearly all; and, while some discard bichloride of mercury *in toto*, others are using it in weak solution, and following its action with bromide of potassium, two grains to the ounce.

Business has been unusually brisk with photographers in our large cities, but they have been put to their wits' ends by the continued cloudy weather. Happy am I now to say that sunny days are once more coming—two and three in succession; and soon we may hope to clear off old scores of printing when our clear blue sky is without clouds for weeks at a time, as it is in spring and summer.

As the clouds are breaking away above us, so the political clouds seem rising, and a bright glimpse of sunshine is tinging the southern horizon. Most joyfully will we hail the day that will put us in communication with our photographic friends south; for, as Professor Frazer very justly remarked at the Franklin Institute a few days ago, science is cosmopolitan, and we must honour a man's scientific attainments even if we hang him for treason. Most gladly do we hail the news of peace with England, and when quiet is once more restored at home, most earnestly do we hope it will find us friends with all the world.

On Monday evening next, the 10th instant, the American Photographical Society is to meet; and gladly would I delay this letter until Saturday's steamer that I might make use of the Secretary's kind offer to forward me on the 11th the minutes of the meeting of the 10th; but with a stormy sea between me and my readers delay is dangerous; so I must close my letter without the budget of news that may reach me in a day or two. By-the-by, I must not forget to say that much good is being done by the makers of albumen paper, who sell with their paper printed directions in regard to toning and fixing, thus conveying to those of their customers who "do not take the papers" information that might not soon reach them. Sorry am I that there are too many who depend on the photographic art for a living who are quite guiltless of ever spending money on the journals; and I might add, as Professor Seely did, many hard things about their wilful ignorance. But it would be waste of time: they would never see what I should write.

With solar cameras some are using mirrors silvered with pure silver, and great advantages are claimed over the mercury plates in durability, &c. Both Dr. Draper and Mr. Rutherford have done much towards perfecting this kind of mirror, especially for telescopes.

I must squeeze into the end of my last sheet the memorandum that skylights are now being made of ground-glass, facing in some cases the south, instead of plain glass pitched so as to admit only the northern light.

COLEMAN SELLERS.

* On the contrary, we invite individual opinion, provided that it be expressed as opinion and not asserted as established fact.—Ed.

New Publications.

Portrait of H. R. H. the late Prince Consort.

Edinburgh: James Wood, 130, George Street.

There is, perhaps, no more striking illustration of the high estimation in which the late Consort of our beloved Queen was held by all classes of her subjects than the enormous demand that has been created for the numerous portraits of this estimable Prince which have been published both before and after his decease. It was only as we "went to press" with our issue of the 1st ult., that we sat in the Court of Common Pleas, at Guildhall, to watch the progress of an action—which was reported in our last number—having for its chief issue the possession of a negative portrait that had been taken but a short time before H. R. H's. departure from this world. This must have been a costly affair on both sides, and is evidence of the value of such a memento.

We have just had the pleasure of examining a lithographic portrait of the lamented Prince Consort, carefully copied from a photograph taken by Mr. O. G. Rejlander, of Wolverhampton—the lithograph having been drawn by Mr. Schenck, of Edinburgh, for Mr. James Wood, publisher, of that city. When we say copied from Mr. Rejlander's excellent photograph, we do not mean *merely* copied; for, while all the important parts are faithfully rendered—the likeness itself being wonderfully preserved—the subordinate parts have been very artistically kept as subordinates, and the general *entourage*—to employ a convenient and expressive word from our French neighbours—treated with a somewhat more free and sketchy interpretation than photography alone admits. We do not by these observations intend to convey the idea that there is anything hastily or carelessly done: far from it. There is, on the contrary, a most conscientious attention to the highest finish, but nothing over-done; and, as both lithographer and photographer are in the best sense of the word artists, each one has added something to the value of the production as a work of art. Those who desire a pleasing but faithful likeness, and prefer a proof in printer's ink to a photograph, cannot do better than procure a copy of the lithograph now before us.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—In reference to the communication of your correspondent, D. Hornby, contained in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY, will you permit me to state that, although I made some remarks (which appear in your report of the meeting of the North London Society, but not in that of any other journal that I am aware of) upon the pictures taken by Mr. Wilson, I most emphatically declare that I studiously avoided making any remarks whatever upon the lenses of other makers, as such remarks from me would have been out of place. I may inform your correspondent that I never publicly discuss the merits of other makers' productions. I may be allowed this opportunity of saying that it is a very rare occurrence for me to address any of the Societies of which I have the honour to be a member; and further, that upon no occasion do I so address a meeting without first having made myself at least somewhat acquainted with the subject under consideration.

I wish it to be distinctly understood that I do not in any way disparage the invention of the "triplet," as I have myself been engaged lately in its manufacture. I believe it to be a most valuable instrument for some subjects connected with the photographic art, more particularly for copying maps, prints, &c., and for some architectural subjects, in which lines are required to be absolutely straight and parallel.

I am not aware that I said anything which would lead your correspondent to the conclusion that I believe single lenses would give as large a field of view as the triplet; if so, I have not been correctly reported, and this I do not imagine to be the case, as I have found that the gentlemen connected with the photographic press generally report such matters with a fair amount of accuracy. It is quite evident to my mind that your correspondent is not acquainted with all the circumstances of the case, otherwise he would not have been led into the inference he drew. However, as I have neither the time nor the inclination to become involved in the mazes of a long correspondence, and, having recorded my protest against a statement arising from misapprehension, but which I sincerely believe was made in good faith, I am now anxious to dismiss the matter, hoping Mr. Hornby will become possessed of more of the details connected with the subject, and then he will, in all probability, come to the conclusion that *the very statement of a fact in which he has anticipated me will prove to be in perfect accordance with the truth.*

I am, yours, &c., THOMAS ROSS.

2 *and* 3, *Featherstone Buildings, High Holborn,*
London, March 24th, 1862.

THE PROPOSED SUPPLEMENTARY PHOTOGRAPHIC EXHIBITION.

To the EDITOR.

SIR,—M. Claudet is quite right, and the South London Photographic Society gentlemen, in my humble opinion, quite wrong. The Crystal Palace is *not* the place for a Photographic Exhibition, and I apprehend their attempt to establish one there will *not* be a "great success."

There has been, as M. Claudet states, an Exhibition of photographs at the Sydenham Palace for several years. Now I should be glad to know how many daily visitors disturb the monotonous and solitary life of the unhappy policeman who keeps watch and ward over that department. Judging from my own observation, he can have very little difficulty in answering.

Now this neglect of the Crystal Palace Exhibition on the part of the public does not prove their indifference to the art, but simply that there are in the building more attractive objects to the general taste; and that while according to photography all honour and credit, and admiring its beautiful results, they *prefer* the attractions of a Blondin, a Grisi, or the fountains.

I quite agree with M. Claudet that an Exhibition of Photography must be exclusively such, where people will go for the sole purpose and object of examining and studying its productions; and also that it must be in *London*—not in the country—and under the auspices of the Parent Society.

I demur, however, to the suggestion of charging rent to the exhibitors for any space they may occupy. Such a charge, I daresay, would not be seriously objected to by the profession; but it would most undoubtedly have the effect of excluding amateurs, for they would not pay for space.

With respect to the admission fee, I am of opinion that one shilling during the day, and sixpence in the evenings, is the price that will bring most visitors; and it would be unwise to have a half-crown day.

No doubt if a few gentlemen come forward as guarantors, it would be surer; but I really do not think there need be any fear of pecuniary loss to the Society this year at all events. Energy, activity, and judicious ventilation through the medium of the press, is all that is required to ensure success.

I hope the Society may soon hear of a suitable room for the proposed Exhibition, and that at their next meeting they may be in a position to announce their intention of opening it on the first of June next.

London, March 25th, 1862. I am, yours, &c., SUBURBAN.

ENLARGEMENT.

To the EDITOR.

SIR,—For some time past I have employed a process for enlarging similar to the one described in THE BRITISH JOURNAL OF PHOTOGRAPHY for the 1st of March, under the head of "Notes, Harmonious and Discordant." My success has been very good, but the chief difficulty I find is in the paper employed. With Saxe paper, simply iodised with iodide of potassium, and sensitised with aceto-nitrate, I can enlarge a *carte de visite* negative to cover a sheet of paper 17 × 22, the exposure required being, on a dull day, about eight minutes. The detail and finish is beautiful; but in drying they lose all their brilliancy, and sink so much into the paper that no varnish or polish will do them any good. Marion's Heliovelin paper gives a somewhat better result; but the exposure under the same conditions is three-quarters of an hour. Towgood's paper gives capital results, but the exposure is thirty times as long as that given to the Saxe paper. Turner's paper gives almost perfect results, but the exposure required is the same as Towgood's, and its small size (19 × 15) prevents it from being used where a rather large enlargement is required.

Can you or any of your correspondents kindly give me any information respecting any paper or process which is very sensitive without allowing the picture to sink in the paper?

Apologising for trespasing on your time,—I am, yours, &c., F. V. B.
March 14th, 1862.

[You do not appear to have tried what we regard as the best English paper for printing upon—*Hollingworth's;* and if you prepare this by *floating* on salting solution containing gum tragacanth, you will find the image keep well on the surface.—ED.]

DRY PROCESS—DARK CHAMBER—BATHS.

To the EDITOR.

SIR,—I am desirous of trying a dry process, and have waited in vain for the enthusiastic praises on Mr. Hislop's "revival." I am afraid your great guns do not look upon it with much favour, and, for that reason only, I am going back to your suggestion on page 358, Vol. VIII. (Fothergill process).

But I cannot find in your back numbers Mr. Hannaford *On the Fothergill Process,* nor Mr. Barber's suggestions referring to that paper.

At page 174, Vol. VI., I find—*Sensitive Dry Collodion Process,* by Hannaford. Can this be the paper?

In quoting Mr. Barber's suggestions for the albumen solution, you say—Vol. VIII., page 359, 10th line—"And a sufficient quantity of oxide of silver dissolved in ammonia. The sufficient quantity should be determined by trial."

How am I to try? as the paragraph does not tell me the object of the oxide of silver and ammonia.

If I send a dark chamber six feet high, of *solid wood,* to Calcutta, what *wood* would suit the climate? I thought inch pine plank.

Two years ago I doctored my bath (it contained aqua dis. 1 ounce, nitric acid $\frac{1}{20}$ minim, alcohol 15 minims, and nitrate of silver 30 grains—the silver saturated with iodide of potassium), by adding oxide of silver drop by drop, shaking well between each drop, exposing the same to daylight for three days, then filtering and *acidifying* with nitric acid. I obtained a bright clear fluid, but no picture, it being lost in a dense fog; but the bath at the present time is as clear as ever. What can I do with it?

The oxide of silver was Thomas's: can it now be of any use, it being two years old, whereas you are always saying it should be freshly precipitated? Take pity on an unfledged bird—quite A. GOSLING.
March, 21st, 1862.

[The mode of operating suggested by Mr. Hannaford, orally, at one of the meetings of some society, was to have a small portion of free nitrate of silver on the plates, and pouring thereon the albumen solution containing free liquid ammonia—thus converting the nitrate of silver into the oxide, which is soluble in ammonia. Mr. Barber's suggestion was to add to the albumen solution a given quantity of ammonio-nitrate of silver instead, as that would be more likely to ensure uniform results—a suggestion which plainly commends itself for its soundness. The use of the oxide of silver is to render the albumen sensitive to light, as it forms a compound with that substance which turns black on exposure thereto. We apprehend that the more oxide of silver the albumen will bear without causing the plates to fog the more sensitive they will be.

We do not consider pine plank at all suitable for India. *Moulmein teak* is the best material for your purpose; and, if you have the chamber framed, half-an-inch or even less will be thick enough for the panels.

It is probable that your bath may contain organic matter oxidised by the nitric acid. If so, you had better convert the silver into the chloride, and reduce it subsequently to the metallic state. We presume it is faintly acid to test paper.

Your oxide of silver is still available.—ED.]

PRINTING TRANSPARENCIES.

To the EDITOR.

SIR,—I have a camera specially constructed for taking small views or copying fine engravings. These negatives I take on wet or dry plates, as suits my purpose. Now, I want to reproduce them as positives for the magic lantern. As I have a good lens—Dallmeyer's No. 1 B—I manage to get a good negative, brilliant, sharp, and full of detail.

1. Which process would you recommend as giving the *best* results?

Wet collodion, and by transmitted light in copying camera, or with dry plates in same; or with dry, and by superposition in pressure-frame? I see some recommend camera-printing; but does the wet collodion give clear and transparent proofs? If so, I have a good camera for the purpose.

Which dry process is best for obtaining the negatives on the small plates—"tannin," or the one without preservation, by Langue?

My plates are 4¼ inches square; would you advise me in the tannin process to gelatinise them, for preventing the film from slipping, or can it be managed without? Is it necessary to gelatinise them?

Our Rector's brother has taken several transparent views for the lantern, he tells me, on albumen, and by superposition; but they appear specky and not satisfactory to my taste, while some of Negretti and Zambra's manipulation appear clearer. I have purchased small lots as samples lately—some by Mr. Highley are exquisite. However, thinking you would kindly aid me, I have thus ventured to take up your valuable time; and, if you will kindly notice my questions, it will be much esteemed by your subscriber, G. T. J.

Salop, March 21st, 1862.

[Very good results may be obtained in the camera, but better by direct contact printing; for which purpose we believe the tannin process to be decidedly the best, as it is noted for producing clean shadows and warm, pleasant tones. For the sized plates you name, we do not think you will need to give a preliminary coating with gelatine.—Ed.]

PIN-HOLES IN COLLODIO-ALBUMEN NEGATIVES.

To the Editor.

Sir,—I think that if your correspondent would iodise his albumen with ammonium in preference to potassium, and also if he were to thoroughly saturate his aceto-nitrate bath with iodide of silver, he would be no longer troubled with pin-holes. The bath should be saturated with iodide of silver before adding the acetic acid. Last year I was very much troubled with the same complaint, but having this year tried the above modification, I have not as yet noticed any. I may add that Mr. Ackland, of Messrs. Horne and Thornthwaite's, was my informant.

London, March, 1862. I am, yours, &c. S. CONWAY.

P.S.—The enclosed is a specimen print from an untouched collodio-albumen negative, clearly showing the absence of pin-holes.

A MULTIPLICITY OF QUERIES.

To the Editor.

Sir,—Will you again allow me to trespass on your valuable time by asking the following:—1. Which is flint and which is crown glass of portrait combination? 2. Can I get flint and crown glass from Mr. Forrest thick enough for ¼ lenses? 3. Can I get the peroxide of tin from the chemist? 4. Can you give me an easy method to find the exact thickness that ¼, ½, and ¼ lenses ought to be ground to? 5. Is the front combination joined by Canada balsam? 6. Are the grinding tools best made of brass or iron? 7. How to prepare paper portraits for oil painting? 8. Will the positive silver bath do for iron negatives? 9. What length of background do I require for *carte de visite* portraits?

With many thanks for past favours, I am, yours, &c.,

21st March, 1862. B. R. J.

[1. The convex lenses: those on the outside of the combinations as arranged in the mounting are crown or plate glass, the others are flint. 2. No doubt you can. 3. Yes. 4. It must depend upon the refractive and dispersive powers of the glass employed: we can*not* give you an easy method of finding what you require: you must study the theory of the subject, 5. Yes. 6. Iron will do very well, but perhaps brass is the best. 7. See Wall's *Manual of Photographic Colouring*. 8. It is not well adapted for it, being generally used with nitric acid, which is objectionable. 9. The same as for any standing figure—7½ to 8 feet.—Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In Messrs. Bury Brother's advertisement, "Cards for Album Portraits," an obvious typographical error occurred in our last number. For "Printed by Steam Power, 2000 per day," *read* 20,000. It would have occurred to the reader that the former number was quite inadequate for the capabilities of such an establishment. The corrected advertisement appears in the present number.

R. L.—We shall have much pleasure in introducing your name as you desire.

L. R.—We will consider it, and if we think well of the idea inform you in our next.

Thomas Robinson.—We are compelled to postpone your communication until our next, for want of space.

Old Subscriber.—Number 3 is not at all suitable to your purpose: you have quite mistaken the intentions of the advertiser. Apply to him direct.

Ag. O. N. O 5.—We have had similar complaints of the conduct of the writer you name with reference to similar proceedings. We are not surprised: it is of a piece with the rest of his policy, or rather impolicy.

Cyanide.—It would be unwise to act as you propose. Carry out your part of the understanding and put him in the wrong: you will then have the game in your own hands eventually, though you must bide your time.

An Amateur (Dublin).—A half plate portrait lens, of an English make, *reversed in position*—that is, with the back lens towards the negative. Stops in contact with the front lens.

I. J. (Bristol.)—A series of white blinds on light wooden frames, about a foot in depth, arranged at intervals along the glass roof like the leaves of a Venetian blind. They should be capable of removal in cloudy weather.

F. J. M.—We have nothing to do with the contemplated Photographic Exhibition at the Crystal Palace; but if you will write to our contributor, Mr. A. H. Wall, 35, Westbourne Grove, Bayswater, we believe he will give you every information.

Speculum.—You will perceive, by a notice under the head "Meetings of Societies," that the subject of photo-micrography will be discussed at the North London Photographic Association on the 16th inst. See also an article in the present number.

Portable Bath.—The so-called ebonite, that was tried by Mr. Ross and found to be brittle, was not the genuine article, which is not brittle. You will be able to obtain the right sort from the patentees, Messrs. Silver and Co., Bishopgate Street, London.

Spirit-Rapper.—Mr. Peter Le Nève Foster is the proper *medium* for your remonstrances to be conveyed to the *spirit world*, or higher intelligences of the International Exhibition Photographic Department. We hope they will not *rap out* a negative.

T. G. P.—1. Already answered. 2. We have sent this to Mr. Wall, who says in reply:—"The varnish most commonly used is the white lac. It should be used before a fire or after warming the surface; and is best applied with a small piece of soft linen rag, and a light sweeping touch. It is somewhat difficult to manage." 3. Print transparencies by the tannin process in preference.

J. Horsfield.—There is no need to make any apology for seeking our advice. If you want to stop down the lens you name for portraiture, put the stop in contact with the front lens; if for landscapes, place it between the two combinations, at a distance proportionate to their respective foci—that is to say, if the front lens be to the back as 2 to 3, the stop should be *two-fifths* of the whole distance between them, and nearer to the front lens.

Robt. Barclay.—We have lately examined the *universal microscope* introduced by Messrs. Smith, Beck, and Beck, and can warmly recommend it as efficient and very moderate in price. If you require an instrument in addition to your larger one, you cannot do better then procure one. The objectives to your larger instrument are not adapted to use with the "universal," nor would those of the same makers be so.

Resin.—1. Better use two single combinations for landscapes. We know nothing about the lenses you name. 2. We are not connected with photography commercially in any way, and have no idea of the value of negatives: write to the parties you indicate, and they will no doubt reply to your question. 3. See reply to query 1. With a little ingenuity you might make a stereoscopic camera for two lenses for your own use; and you could obtain a pair of landscape lenses for much less than you name. Your own tripod you could also construct. Your supposed test for rapidity will most probably deceive you: try foliage in shadow, or a yew tree any how, and then let us know about rapidity. As there is no indication of locality in your note we do not know where "*this place*" is.

W. S. (Belper.)—1. Mr. Hare, of Pentonville, advertised such a camera as you inquire about. We believe it to be well made and efficient. He would, no doubt, make one to your own pattern if you desire it. We recommend, however, a form introduced by Murray and Heath, of Piccadilly, called Marriott's camera, made to take plates about seven inches square, upon which two pairs of stereographs can be taken—provision being made for shifting the lenses before exposing the second half of the plate. There are several advantages attending the use of this camera, especially for dry plates. 2. Your manipulation appears to be very good. To judge from the specimens received the exposure might have been a *trifle* longer with advantage. The development is quite sufficient, the materials good, and properly prepared. Your artistic qualifications will however bear considerable improvement: to begin with, you want shade, especially over the heads of your sitters. We perceive you have a railing and stone steps behind your sitters: these would well support a piece of white calico, in the form of a canopy, to shade the direct vertical light. A screen also should be placed on one side or other—not close enough to be included, but to moderate the light on one side; and your step railings would also carry a good plain background—a piece of red or green baize for a dark one, a blanket for a light one, unless you are inclined to have one made on purpose. The lady in the chequered dress is the best posed. The pose of that one in which the dog is included is very ungraceful, as it makes her appear much shorter than she is in reality: the attitude is stiff and formal, and, owing to the absence of shadow, there is no foreshortening of the figure rendered visible. 3. The four and a-half inch are most useful.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 164, Vol. IX.—APRIL 15, 1862.

We have much pleasure in announcing that we have made arrangements with Mr. F. Maxwell Lyte for original contributions to The British Journal of Photography, which will appear from time to time, the first being included in the present number. Mr. Lyte's name, as an experienced scientific photographer, is too well known to need any commendation from us.

By inadvertence we omitted to make earlier a similar announcement with regard to M. D. van Monckhoven, from whose pen original articles have already appeared in the current volume, and others will follow in due course.

We may also mention that we have in preparation a short series of articles entitled—*Where to Go with the Camera.*

Chimenti's Drawings.—Our readers have doubtless noticed the controversy between Sir David Brewster and Dr. Carpenter that has been carried on relative to the question of whether a pair of pictures, alleged to have been executed in the sixteenth century by Chimenti, were or were not intended as illustrative of the laws of binocular vision.

Our issue of the 15th ult. contained an abstract of a paper read by Sir David Brewster at a late meeting of the Photographic Society of Scotland, and our last a report of a lecture delivered by Dr. Carpenter at the London Institution, both bearing on the same subject. Although we were favoured by the latter with the loan of photographic copies of the drawings, we abstained, as is our general custom, from offering any opinion until both sides of the question were fairly before our readers; but it now becomes our duty to give evidence upon the facts that are before us. That the two pictures differ from one another but slightly, there cannot be a doubt; and personally we have none that the producer of them did *not* intend them to illustrate the phenomena of binocular vision, because, had he done so, whatever other errors of construction he might have fallen into he would certainly not have committed one that is very palpable to the careful observer—we allude to the *vertical* difference existing between corresponding parts in the two pictures. Assuming Chimenti to have been the author of both the drawings, and that he was acquainted with the importance of the two points of view to the due appreciation of stereosity, he can scarcely have failed to have known, also, that in the vertical direction there should have been no difference. The pictures represent a young man seated on a low stool, with the left arm and leg extended towards the spectator: a pair of compasses are in the left hand, while the right hand is raised, as if holding a sheet of paper, and the right leg doubled under the figure. There is a kind of epaulet to the doublet, and, on measuring the distance between it and a point in the skirt in one copy, it is considerably *shorter* than in the other—so much so that an interval between the last-named point and the stool of from one-eighth to one-fourth of an inch is included in the same distance in one copy and excluded in the other. Again, the vertical length between the left knee and foot is greater in one copy. This of itself is a very important feature towards deciding the question before us; but, taken with others, it becomes of greater moment. In one copy the figure is looking downwards much more than in the other, and, when in the stereoscope, if the bodies are made somewhat to coincide, the heads will not combine at all. By shifting one a little out of the perpendicular, some kind of combination may be brought about between the two heads; but in this condition the heads present a pseudoscopic effect, while the bodies are altogether thrown out of adjustment. The stool is in one copy quite horizontal; in the other the top slopes downwards towards the back of the figure. That some kind of relief is apparent when the two pictures are placed in the stereoscope we admit; but we cannot, with the utmost latitude of imagination, concede the assumption that the artist proved himself by these drawings to have been at all acquainted with the theory of binocular vision. What, then, can have been the reason for executing two copies of one subject, and mounting them side by side? Now, however difficult it may be to answer this question, we cannot perceive that such difficulty adds to the strength of the stereoscopic theory assumption. But we have, for the sake of argument, temporarily supposed both drawings to have been executed by the same hand: is there, however, any sound reason for coming to this conclusion? It has been very plausibly suggested by Dr. Carpenter, in his lecture, that they may be studies of the same subject executed by Chimenti and his pupil simultaneously from a living *model;* and, if this conjecture be correct, it will fully account for the amount of apparent relief in some parts as well as for the discrepancies in others. It is altogether incomprehensible to us how so an acute observer as Sir David Brewster can have failed to have noticed the latter; and we are certainly of opinion that Professor Wheatstone's reputation as the first discoverer of the stereoscopic principle remains intact so far as the evidence of Chimenti's pictures can influence the question.

Since writing the preceding, the photographs to which allusion is made above were laid before the Photographic Society, as will be noticed in our report of the meeting; and our view was universally corroborated by many with whom we discussed the matter after the conclusion of the business of the meeting.

A visitor present during the sitting who made some suggestions deprecating the conclusion arrived at, fortunately had with him photographic copies of the same pictures, which copies we understood to be those that had been in Sir David Brewster's possession; and we considered them better for the purpose than those we had from Dr. Carpenter, as they presented the appearance of having been taken direct from the paintings, while those we first saw seemed to be copies of tracings made from the same. However, we took the precaution of comparing the two sets, and found them to agree together completely, so that there is no room left for any supposition of either having been tampered with.

One more remark, and we have done with the subject. There were several artists present at the meeting, and no fewer than three of them expressed the opinion that one of the copies was evidently by the hand of a master—the lines being firm and bold—and that the other was as evidently by a less practised hand, there being evidence of indecision and weakness of handling.

Photography at the International Exhibition.—We should almost imagine that the Royal Commissioners are desirous of discouraging to the utmost extent of their power the practice of photography. Not content with heaping contumely upon the productions by classing them with machinery, and cramming them into an absurdly insufficient amount of space, they, while asking for tenders for the exclusive right of taking photographs in the building, with singular inconsistency, refuse to afford the smallest accommodation for preparing and developing plates. They also impose the restriction that operators shall only be permitted to work before ten o'clock in the morning, and even this small amount of liberty to be subject to withdrawal at the caprice of the Commissioners or their officers. Why do they not prohibit the practice of photography within the building altogether? Should they do so, we fancy we know somebody who would take pleasure in outwitting them. There would be plenty of scope for the ingenuity of our Liverpool friend who converted his hat into a camera, and his umbrella into a tripod—(see No. for 15th July, 1858)—to say nothing of Mr. Skaife and his pistolgraph, by which (as he advertises) he can take portraits (or views) without the knowledge or consent of the individuals concerned!

We remember a good story in connexion with the Crystal Palace, when first opened at Sydenham. An amateur, innocent of the existence of any exclusive photographic privilege, quietly set up a camera in the grounds, but was soon pounced upon by a policeman with an intimation that he must desist unless he had a written order from Mr. Delamotte permitting him to operate. The photographer had just uncovered his lens (he was working the calotype process), and attempted to argue the point; but, finding the policeman imperative, *he left the camera in charge of the policeman while he went to seek Mr. Delamotte!* Of course he did not find him—told the policeman so on his return after the lapse of about twenty minutes—and reluctantly (?) shut up his lens and removed his camera; but, singularly enough, when he attempted to develop his sheet of paper he found a very good negative of the building, notwithstanding the fact of the camera having been in custody during the exposure, and we are not sure that he valued the negative any the less in consequence of the ingenuity he had to exercise to obtain it. Without exactly justifying the proceeding we could not help being very much amused thereat; and it would not surprise us to find analogous *ruses* resorted to, if need be, during the forthcoming season.

What pretence there can be for discouraging photographers in the rigorous manner at present in contemplation we cannot imagine. Should the artistic copyright bill now before Parliament become law, there can be no pretence of the repressive system being for the protection of those exhibiting works, which are valuable on account of their designs.

Carbon Printing and Prizes.—The reward of 2000 francs, offered a few years back by the Duc de Luynes for the best photographic printing process in carbon, was, at the meeting of the French Photographic Society, held on the 21st ult., adjudged to M. Poitevin by the Committee charged with that duty; and an additional prize from the funds of the Society, in the form of a medal of the value of 600 francs, was also conferred upon M. Fargier for his ingenious modifications of the original process.

A fatality appears to attend upon the system of offering prizes for the supposed encouragement of objects photographical; for very rarely indeed do the awards give universal or even general satisfaction. So on the present occasion M. Charavet, the purchaser and proprietor of M. Fargier's process, protested vehemently against the judgment of the Committee, and that in a manner which seriously ruffled the serenity of the members present at the meeting; and, if report speaks truly, M. Charavet concluded by making his exit from the room in a towering passion.

Is there no rose without its thorn?—no honey to be had without somebody being stung by the bees? We have long been convinced of the impolicy of entrusting the award of prizes to a number of persons conjointly, not any one of whom is personally responsible for any particular decision. It is, in our opinion, far better to leave the matter entirely in the hands of one individual, whose attainments are such as to command respect, and whose integrity is unquestionable. Unsuccessful competitors rarely, under such circumstances, complain of injustice, but rather attribute their disappointment to want of judgment only. Whatever mistakes may be made by the Photographic Society of Scotland with regard to prizes, it certainly acts most wisely in this particular point at least.

ON MEALINESS IN TONING, AND ON A HITHERTO UNOBSERVED CAUSE OF THE FADING OF PHOTOGRAPHS.

By F. Maxwell Lyte, F.C.S.

Two different kinds of mealiness may occur in albumenised prints—one being produced by an inequality of action in the toning bath, the other by a deposit which takes place in the body of the paper. The first of these may result from an unequal distribution of the albumen over the surface of the paper, from having been dried in a damp atmosphere, from an imperfect whipping of the albumen, from the use of stale albumen, from an excess of salt in the paper, or from the nitrate not having been properly washed out before the paper was placed in the salting bath previous to toning. Should the paper not have been rapidly dried, or should the albumen have been imperfectly whipped, the absorption of the albumen by the paper will be unequal, and a coating of variable thickness produced. Now, as a general rule, it may be said that the thicker the coating of albumen the redder the proof will tone, from the fact of its being less easily penetrated by the toning liquid, so that when an uneven coating of albumen is given to the paper the proof when finished will show a mottling of red and darker colour.

The use of stale albumen—the alkalinity of which acts on the size of the paper—seems to tend to a like result of unequal absorption.

An excess of salt in the albumen, or an imperfect washing out of the nitrate before the salt bath previous to toning, causes a deposit of chloride of silver on the face of the proof which shields its surface in parts from the action of the toning bath; and the former of the two last-mentioned causes also produces a porosity of the surface peculiarly favourable to mealiness. All these causes may be resumed in two words—"unequal absorption" of the toning bath. The other cause of mealiness, viz., the deposit in the tissue of the paper, seems mainly to belong to the use of stale albumen. It has been the practice with many of the preparers of albumenised paper to let the albumen get a little old, with a view of obtaining a finer and more equable coating. Be this as it may, stale albumen always gives a paper which rapidly embrowns on keeping, and some compound of silver seems to form in it which is insoluble in hyposulphite of soda, and leaves in the fixed and washed proof the deposit above alluded to.

One cause of the failing of positive proofs has remained hitherto unnoticed—that is, the employment of hyposulphite of soda by the paper-makers as an antichlore. It is obvious that the use of this material must induce a deposit of sulphur in the tissue of the paper, and it is highly probable that a slight excess of hypo. usually remains. I have before me a sample of cardboard which is so sulphurised that it is possible literally to extract the sulphur from it by sublimation. A piece of a proof pasted on this board, and placed in a damp situation, would become in a few months mottled all over with yellow patches. With this destructive element in our cardboard mounts, how can we expect our prints to stand? This fact will account for many of, if not all, the anomalies which are found to occur in the fading of prints. Very often when a batch of proofs have been finished and mounted some will stand perfectly, while others fade rapidly.

Again: this fact accounts for another peculiarity—that photographs have been found to fade more rapidly in the portfolio than when framed or hung up.

It is obvious that, if a picture be packed in a portfolio with the silver surface in direct contact with a sheet of sulphurised cardboard, it could hardly be placed in a position more certain to ensure its fading.

ON A RAPID DRY PROCESS, PRINTING TRANSPARENCIES, AND REMARKS ON "INSTANTANEOUS" PHOTOGRAPHY.*

By William England.

As it is most desirable that everything coming under the observation or practice of the photographer tending to the advancement and development of the art should be made known, I venture to occupy your time with a few remarks. An additional inducement to me to ask your attention is the interest you manifested in the pictures which I had the honour of exhibiting before you at the last meeting of this Society. It is to the method by which those pictures were produced that I propose to call your attention. I do not pretend that I have much to say with which many gentlemen present are unacquainted, neither can I lay claim to much that is original, therefore it is chiefly to the details of manipulation I shall confine my observations.

The process I adopt is that known as "Major Russell's Tannin Process." I have tried many others, but have not been successful. Taupenôt's gives impressions too hard and strong in the lights, faults which the utmost care in developing has not overcome. The same, too, may be said of the Fothergill process so far as my experience proves, besides the many difficulties of manipulation; such, for instance, as washing the plates too much or too little, and the unevenness of development, due no doubt to the albumen coating being porous in some places and horny in others, causing the print, when finished, to present a very patchy appearance. I do not say that all these faults are to be placed to these processes. Probably by very long practice they may be overcome and good results obtained; but I really believe that the simplicity of the tannin process places it at the head of all other methods, and that with it finer results may be obtained, not only as transparencies for the lantern or stereoscope, to which it is so well adapted by the soft and beautifully warm tones produced, but also in the production of negatives.

Much has been said and written upon the long exposure required for tannin plates, and the great inconvenience of the film leaving the glass during development. In answer to the first objection, I may say that with a slight modification, to which I shall presently refer, and the choice of a suitable collodion, I have been able to reduce the time of exposure to the average length given to wet collodion developed with pyrogallic acid; and I have no doubt that were it possible to prepare a solution of iron, or some other equally energetic developer, suitable for developing tannin plates, pictures might be produced absolutely instantaneously. As to the film leaving the plate, I at first found some difficulty, particularly with very new collodion. I could not make up my mind to albumenise or gelatinise my glass, previous to coating with collodion, as recommended by some operators, not only on account of the time it occupies, but also of the difficulty of getting a plate so prepared free from spots and dust. I can now, after considerable practice, prepare plates of large, and then cut to stereoscopic, sizes without injury to the delicate film, by which means a saving of time is effected.

The collodion most suitable, as far as my experience enables me to speak, is prepared in the following manner. To five parts of ether and three of alcohol, add sufficient pyroxyline to give a tolerably thick film. So soon as well settled, decant into another bottle, and measure off two portions of ten drachms each. To one add forty grains of bromide of cadmium, and to the other thirty grains of iodide of ammonium. Shake till dissolved, and put by to settle. When throughly settled, add one drachm of each to six parts of plain collodion. I have tried various methods of iodising, and prefer this mode to any other, not only on account of its being more free from the production of spots, but also that immediately after iodising it is in as good a condition for working as the usual collodion after being iodised some days.

During a great number of experiments in trying to increase the sensitiveness of dry plates, I found that the addition of honey has a remarkably accelerating effect, and by rendering the film less horny assists materially the development of the image. I am quite aware that the use of honey in photography is not new: we all remember the charming productions of Mr. Maxwell Lyte. But honey used simply or in combination with acid, as in the oxymel process, leaves the plates tacky and liable to injury from dust. This is not the case by using it in the proportions I shall presently recommend in combination with tannin. By following this method, and using collodion prepared as before mentioned, the time of exposure for stereoscopic pictures in a good light would average not more than from ten to fifteen seconds.

* Read at a meeting of the London Photographic Society, April 1st, 1862.

After cleaning and coating the glass, sensitise in a forty-grain bath, and wash in a second bath of distilled water, to which has been added thirty or forty drops of acetic acid. The plate may remain in the latter while a second is being prepared. The plate is then thoroughly washed under a tap, and coated with the tannin solution, composed of fifteen grains of tannin and fifteen grains of honey to the ounce of water. It is then ready to be placed in the box to dry.

I may here remark on the great care necessary to avoid stains. If possible a silver dipper should be used, being more convenient to hold the plate in washing. When necessary to handle the plate do so with a piece of blotting paper; also, in coating the plate with tannin, lay a piece of paper between the plate and fingers.

The drying-box I find convenient has three shelves, and up one side is fixed a tin tube, under which a spirit-lamp may be placed.

After the necessary number of plates has been placed in the box, it should not be opened till they are perfectly dry, otherwise a stain will appear across the plate where the action of drying has been checked by the admission of cold air to the box. Daguerreotypists will readily understand this from the difficulties they may have experienced in drying off Daguerreotype plates, particularly the larger sizes.

To prevent the film leaving the glass, an excellent plan is to pass a sable pencil, previously dipped in a solution of white wax and benzole, round the edge of the plate to the extent, say, of one-eighth of an inch. This for the purpose is far superior to spirit varnish. The plates may then be stowed away ready for use, and, if properly prepared, will keep six months.

On removal from the camera, place the plate in a bath prepared with ten grains of nitrate of silver and five drops of acetic acid to the ounce of water, allowing it to remain in about one minute. By the adoption of the plan above described for dry plates the action of the developer is almost as rapid as in the wet process. Develop with the usual three-grain solution of pyrogallic acid. The development is so similar to that with wet collodion that I need only remark that no fear need be entertained of the film breaking up, the edges being kept perfectly dry and tight by the wax border.

The second subject of my paper is the printing of transparencies. The mode of preparing the dry plates is much the same, except that for this purpose old collodion must be used. If of a dark red so much the better; otherwise in printing from a strong negative it is impossible to get an impression clean and well-defined, on account of the tendency of new collodion to solarise and present a weak and foggy impression. Better tones will also be obtained by reducing the coating solution to ten grains of tannin and five grains of honey to the ounce of water. The developer should likewise contain citric instead of acetic acid, as recommended by Major Russell; and unless a considerable amount of silver is added, the print is sure to be red or reddish-brown instead of purple. Pictures for the lantern should be thin, very clean, and well defined—not developed so deeply as those for the stereoscope.

I will conclude by making a few remarks upon instantaneous photography; and here I may say that a very large amount of patience is necessary, and that failures are very plentiful—bad light, the absence of the sun at the identical moment when the plate is most sensitive, the variations in the quality of the chemical agents employed, and, above all, the difficulties that attend the nitrate bath, which will sometimes unaccountably persist in giving foggy impressions. Again, sometimes we get beautifully clear plates but with very little impression beyond the high lights. Now all this is very disagreeable; but such is the case at present, and will so continue to be, I fear, until we have a dry process sufficiently sensitive. Where time of exposure is no object, of course we do not meet with these troubles.

The collodion used in taking the negatives of the impressions I have the honour of placing before you was prepared in precisely the same way as before mentioned, except that, in iodising, I use three grains of bromide of cadmium and the same amount of iodide of ammonium to each ounce of collodion.

I am an advocate for the liberal use of bromides, having experienced their beneficial effects, particularly in photographing objects presenting violent contrasts of lights and shades. Under such circumstances I should use the bromides considerably in excess of the iodides.

The nitrate bath should be of the strength of forty grains, saturated with iodide of potassium, and perfectly neutral.

I need scarcely remark that the utmost care is necessary in the preparation of the bath, also in the selection of nitrate of silver, which should be pure recrystallised, otherwise the amount of acid to prevent the plate fogging will materially injure the sensitive-

ness. We do not experience this so much in ordinary working, where the time of exposing the plate is not limited. With every caution in preserving the bath from injury, I have never been able in working instantaneously to use it more than five or six days; after that its sensitising properties diminish rapidly, but it is still very good for general purposes. Another important point, too, is to expose the plate within a very short time after its removal from the nitrate bath, or it will lose much of its sensitiveness. Here is one great cause of failure, as oftentimes the sun disappears behind a cloud just as the plate is ready. There is no remedy but to try again.

A word or two may here be said upon the form of lens best adapted for rapid working. For street views and public buildings, I find it a great advantage to be provided with three sets of double achromatic of the respective focal lengths of 5½, 4½, and 3½ inches. By this means one is enabled to enlarge or reduce the image to the size suited to the plate. I prefer using the first named, being with that enabled to use a larger stop; but in copying architectural subjects in crowded localities want of space oftentimes compels one to resort to a lens of shorter focus and consequently a smaller stop. In all cases it may not be convenient to be so liberally provided. To those not having at command a variety, I would recommend a lens of 4½-inch focus as being the one most useful. Cannot some of our best opticians construct for us a lens which would enable us to vary the size of our picture where distance, or rather the want of distance, confines us to one spot? What, for instance, displays worse taste than copying a public building, leaving out foreground and sky? And yet the operator is sometimes reduced to this or leave out altogether.

I have made many experiments in the mode of exposing the plate, in placing the shutter in front of the lens; also immediately behind it; and, lastly, near to the plate, which answers perfectly. I have found, by using the drop in front of the lens, a want of definition in the corners of the negatives. I mentioned this fact some time since to my friend, Mr. Dallmeyer, and should be pleased to hear if he had devoted any attention to the subject. By placing the shutter on the dark slide, and having a contrivance to lessen the size of the slot, we can get different lengths of exposure, which is sometimes an advantage, although, of course, it is advisable in all cases to give the shortest amount of exposure the sensitiveness of the plate will allow, otherwise moving objects will not be well defined.

The developer I generally use is protosulphate of iron, two ounces; water, one pint; acetic acid, the least possible amount, which I determine according to the temperature, varying from four to eight drachms. Should too much be added, it is not so easy to develop objects in the shade. After the impression is fully developed, strengthen with pyrogallic acid.

I have now, gentlemen, given you the details of my mode of operating, and should I not have made myself sufficiently understood, I shall be happy to answer any question. In conclusion, I beg to thank you for your patient attention, and to assure you that I shall be pleased if what I have said should elicit further information from the members present.

STRAY CHAPTERS FOR PHOTOGRAPHERS.

By James Martin.

CHAPTER III.

DIALYSIS APPLIED TO PHOTOGRAPHY.*

Science is indebted for the discovery of the process termed "dialysis" to the patient and laborious investigations of Professor Graham, F.R.S., and Master of the Mint, who has communicated to the world the interesting and valuable results in an original memoir on the subject, published in the *Transactions of the Royal Society* for 1861.

The process which has been distinguished by the above title depends for its successful practice on the power which animal membrane possesses of effecting the separation of liquids of different degrees of diffusibility, by means of a species of endosmotic action; and is found especially useful in separating from one another the two classes of bodies known to chemists as *crystalloids* and *colloids*.

To make this statement more fully comprehensible it is necessary to go somewhat into detail, and in some sort to follow the history of the successive discoveries which have led to the promulgation of what may now be regarded as a perfected process.

* The author reserves to himself the right of translation of the present, all previous, and all subsequent papers on matters connected with the chemistry of photography, contributed by him to this Journal.

First, however, a word in reference to the two classes of substances named above.

Crystalloids are generally substances susceptible of crystallisation, of which common salt may be regarded as the type: they are marked by a readiness of diffusibility through water, especially when compared to the second class of substances, *colloids*, which are allied to isinglass in their character, and amorphous in structure. The general distinction between the two classes of substances is, doubtless, one of intimate molecular constitution.

The memoir referred to contains, besides a description of the process which more immediately forms the subject of the present communication, details of the earlier methods adopted by the author in determining the relative *diffusibilities* of various substances. These methods were distinguished by the names "vial diffusion" and "jar diffusion."

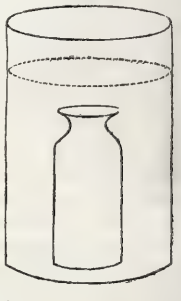
A more thorough appreciation of the interest attaching to these investigations will become possible if, at the outset, we acquire a correct idea of the meaning of the term "diffusion"—a term simple enough in its ordinary acceptation, but possessing in this connexion a peculiar significance.

If water be exposed in a shallow open vessel to a dry atmosphere, it is said to undergo *evaporation*, *i.e.*, its vapour becomes *diffused* through the atmosphere. This phenomenon may be regarded as the analogue of saline diffusion; for, if a solution containing about 20 per cent. of common salt be carefully conveyed by means of a pipette to the bottom of a tall jar, or other vessel of water, in such a manner as to avoid mechanical admixture, it will be found on examination after the lapse of three days, or even less time, that the salt has become so far *diffused* through the entire mass of water as to have reached nearly to the top of the vessel; that the solid salt has, so to speak, evaporated into the superincumbent liquid, just as much as the liquid in the instance above referred to evaporated into the gas air. Without aiming at the accuracy of a definition, diffusion, then, may be regarded as the evaporation of a solid into a liquid.

The method of manipulating which we propose to consider is one which has grown out of, and been adopted after, an experience of sixteen years. It will readily be imagined, therefore, that the earlier experiments were of a very simple nature.

In the *Philosophical Transactions* for 1850, page 25, Mr. Graham refers to the manner in which his earlier experiments were conducted. He gives to the plan which he then followed the name of "vial diffusion." The salt whose diffusive qualities were to be tested was dissolved in water in a certain known proportion, generally 10 or 20 per cent., and being placed in a two or three ounce vial, was carefully lowered to the bottom of a glass jar, about 8 or 10 inches deep, and 4 or 5 inches wide,—the jar having been previously filled nearly to the top with distilled water. It was then set aside for a longer or shorter period, at the end of which the outer liquid was examined.

FIG. 1.



In the case of a 20 per cent. solution of chloride of sodium, allowed to diffuse for eight days, Mr. Graham observed that 58·68 grains had passed out into the larger jar, the portion so diffused being called the *diffusate* (*fig.* 1). Other substances besides chloride of sodium were experimented upon, and the conclusion deducible from the results was that these substances differ materially from one another in the rapidity with which they diffuse. Solutions of the following substances, each containing the same proportion of solid matter, were allowed to diffuse for eight days, with every precaution for securing uniformity of treatment, and with the following results:—

VIAL DIFFUSION.

Substance.	*Diffusate.*
Chloride of sodium	58·68.
Nitrate of soda	51·56.
Sulphate of magnesia	27·42.
Sugar	26·74.
Gum	13·24.
Albumen	3·08.

A mere glance at the above table, in view of what has been said before, will be sufficient to demonstrate that, although "diffusion" may not avail to effect a *complete* separation of any two substances submitted to its action, it is nevertheless sufficient to determine a *partial* one, especially in a case where a highly diffusive substance, like chloride of sodium, and a feebly diffusive one, like albumen, are mixed together. And it is upon this obvious conclusion that the suggestion intended to be put forward in the present paper is based.

Before adverting to this, however, it may be briefly stated that the results obtained by Mr. Graham in his experiments with "jar diffusion" tend to corroborate those obtained by "vial diffusion." The method of manipulating in the former case has been already alluded to, and as it does not bear directly on the point under consideration it will be needless to enter into further detail.

It has been said above that the process of dialysis depends for its successful practice on the property which *animal membrane* possesses of separating crystalloids and colloids. Professor Graham, however, in addition to this says:—"The most suitable of all substances for the dialytic septum appears to be the commercial material known as vegetable parchment, or parchment-paper, which was first produced by M. Gaine, and is now successfully manufactured by Messrs. De la Rue and Co. This is unsized paper, altered by a short immersion in sulphuric acid, or in chloride of zinc, as proposed by Mr. T. Taylor. Paper so metamorphosed acquires considerable tenacity, as is well known; and when wetted it expands and becomes translucent, evidently admitting of hydration. A slip of 25 inches in length was elongated 1 inch in pure water, and 1·2 inch in water containing one per cent. of carbonate of potash. In the wetted state, parchment-paper can easily be applied to a light hoop of wood, or, better, to a hoop made of sheet gutta percha, 2 inches in depth, and 8 or 10 inches in diameter, so as to form a vessel like a sieve in shape *(fig. 2)*. The disc of parchment-paper used should exceed in diameter the hoop to be covered by 3 or 4 inches, so as to rise well round the hoop. It may be bound to the hoop by string or by an elastic band, *or by a second and smaller hoop of gutta-percha;* but should not be too firmly secured. The parchment-paper must not be porous. Its soundness will be ascertained by sponging the upper surface with pure water, and then observing that no wet spots show themselves on the opposite side. Such defects may be remedied by applying liquid albumen, and then coagulating the same by heat. Mr. De la Rue recommends the use of albumen in cementing parchment-paper, which thus may be formed into cells and bags, very useful in dialytic experiments. The mixed fluid to be "dialysed" is poured into the hoop upon the surface of the parchment-paper to a small depth only, such as half-an-inch. The vessel described, *the dialyser*, is then floated in a basin containing a considerable volume of water *(fig. 3)*, in order to induce the egress of the diffusive constituents of the mixture. Half a litre (about 18 oz.) of urine, dialysed for twenty-four hours, gave its crystalloidal constituents to the external water. The latter, evaporated by a water-bath, yielded a white saline mass. From this mass urea was extracted by alcohol in so pure a condition as to appear in crystalline tufts upon the evaporation of the alcohol."

FIG. 2.

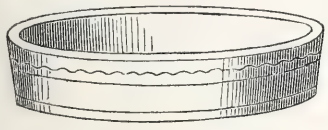
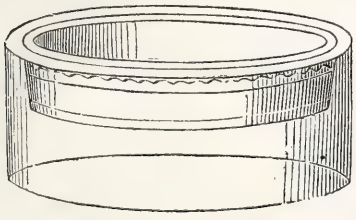


FIG. 3.



A consideration of this last fact, in connexion with the table given above, headed "Vial Diffusion," will suggest to the reader the applicability of this process of dialysis to meet the requirements of those photographers who albumenise their own paper.

(To be concluded in our next.)

ON PHOTOGRAPHIC REPRODUCTIONS.*

By Alfred H. Wall.

We have in photography a discovery which is to art what the printing press was to literature; and of the great masters in art it may be more truly *now* said than at any other time—"Their conceptions are no longer pent up in galleries open to but a few: they meet us in our houses, and are the household pleasures of millions. Works designed for emperors, popes, and nobles find their way, in no poor representations, into humble dwellings, and sometimes give a consciousness of kindred powers to the child of poverty." The engraver may translate into monochrome every line and tint of a painting accurately enough; but so surely will his own individualism, his own peculiar "*manner*," find expression in his reproduction, that even the finest of such are no less representative of the original painting than of the copyist and engraver. The truth of this seems very widely and generally recognised. The *Athenæum* remarked not long since, when speaking of the pictures at Hampton Court:—"Copies multiplied by this—the photographic—process would render more service to students than any lithographs or line engravings now current;" and *The Times*, otherwise no friend to the art-claims of photography, said not long since:—"A photograph of a drawing in black and white, sepia or gray, is hardly distinguishable from the original; and even when the original is in red chalk, the photographic reproduction, darkened as it is, has a precision and spirit that give it a value beyond the most careful copy that can be made by hand." Of paintings the same influential authority says:—"The practice of having their pictures photographed is largely spreading among our painters, and the fact shows, what no man who has the painter's feeling needs proof of, that photographs of pictures have qualities that more than make up for their inevitable untruthfulness in rendering certain colours. They render the spirit and expression of the originals with an effect that may well drive the engraver to despair. * * What line engraving can stand beside even the most unsatisfactory of these photographs as a representative of the original for those who love, above all, the essence and spirit of a picture?" But without further quotations it will be at once apparent that a branch of art which can reproduce with such extraordinary fidelity, rapidity, and comparative cheapness, the noblest and grandest works of high art—extending their influence, multiplying their admirers, and inspiring with their perfections the loftiest art-patron and the lowliest art-student—must, sooner or later, exercise remarkable power in educating and refining the popular taste in art.

The capability of photography as a reproductive art agent being admitted, there is another view of the subject to which I am desirous of next briefly calling attention.

In the year 1773 you would have found in all London only two small shops devoted to the print trade. These dealt chiefly in engravings *imported* from Germany, Flanders, Holland, and France; while the very few inferior English engravers in this country could scarcely preserve themselves and their families from destitution.* So rapidly did the art emerge from this degraded condition that only nine years afterwards it was stated in the House of Lords that, as articles of *export*, engravings produced the country £200,000 per annum. This great change was chiefly brought about, we must remember, by the application of engraving to the reproduction in monochrome of paintings and other similar works of art. William Hogarth, our great English painter, was the first to bring the obscure and ignoble art into high esteem and popular favour, by applying his skill as an engraver to the reproduction of his own immortal works; and, by thus demonstrating the commercial, educational, and industrial capabilities of engraving as allied to painting, awakened a spirit of enterprise which speedily created a new and very flourishing branch of trade.† Now, if the most important element of this branch of trade is, as appears probable, about to pass into the grasp of photography, it is of absolute national importance that so valuable a department should be properly cared for, cultivated, and encouraged. The difference between exporting and importing the productions of any art is the difference between wealth and poverty for its professors—the difference between ignoble obscurity and honourable eminence for the art. Remembering this, it surely becomes members of a Society like our own to give such department careful study, and its process their full share of culture.

If "the highest value of the arts of design consists" (as was said by one of our recognised authorities on the administrative economy of the fine arts) "not in their power to minister to the luxury and splendour of the few, but in their eminent capability to promote the fitting culture and education of all," then may photography fairly lay claim to such value. Indeed, in the mere act by which the Art and Science Department of the South Kensington Museum resolved, in 1858, to publish at cost price photographic reproductions of works by eminent masters, the claim of photography to such distinction was publicly recognised and acknowledged. In the face of such facts as these, then, it seems difficult to understand why Her Majesty's Commissioners for the International Exhibition could have evinced so little policy, foresight, or common sense as they did in classifying the tools of the art and its productions as the result of equal skill and intelligence. If only in this one of its very numerous and valuable applications, the art had the very strongest claims to receive at their hands a more than common share of honour and encouragement, instead of

*Read at a meeting of the South London Photographic Society, April 10th, 1862.

*Roquet.

†Alderman Boydell—once the poor engraver, afterwards as a follower in the steps of Hogarth, the great print publisher—being at the Royal Academy dinner, his health was drunk by Sir Joshua Reynolds, at the suggestion of Burke, as "the commercial Mæcenas of England."

this act of injustice and discouragement. For these reasons, therefore, I bring my subject unhesitatingly before you this evening, trusting that both upon this and upon future occasions it may receive from us that meed of interest and research to which it has so paramount a claim. For myself, as I have no new facts to advance, no scientific experiments to chronicle, no very great experience to speak about, some apology may be due, which I now duly proffer. My further remarks will be chiefly devoted to a few practical hints, rather intended to elicit in discussion more valuable conclusions and opinions than to stand upon their own consequence. There is one circumstance of some significance, however, which I may mention before proceeding. In the last French Exposition of Photography there were nearly two hundred specimens of reproductions of drawings and paintings by celebrated masters: in the London Exhibition there were, perhaps, not a dozen. I shall first speak—

Of Copying Engravings.

Choice rare prints are costly things, and their reproduction, as a commercial speculation, would doubtless frequently prove very remunerative. But the cost of copying and reproducing by engraving such works, say, as Marc Antonio's *Adam and Eve*, which sold for 150 guineas, or the celebrated sabre portrait of Rembrandt, which fetched £600, would be so serious a consideration as to be unworthy of any enterprising print publisher's attention; and thus many an invaluable work of art passes secretly out of existence. Aided by the camera this need no longer be the case, as few or many copies may be reproduced at an expense fairly proportioned to the number required. These old engravings are frequently so stained and discoloured as to render their copying a matter of no small difficulty; it may, therefore, be serviceable if I give a method, which will be found most effectual and easy, which restores the whites, and the clearness, sharpness, and strength of the lines. It is simply taking equal portions by weight of strong muriatic acid and water, and adding three parts of this to one of the red oxide of lead. The discoloured prints are then steeped in this and taken out when restored.

In copying from a flat surface the question of focus is very much simplified; but, as with a good lens the engraving is apt to appear tolerably sharp on the ground-glass when the perfection of sharpness is not yet reached, one ought not to be too easily satisfied. The collodion should give good intensity and not be too new: a slight addition of free iodine secures transparency in the blacks. I prefer copying in direct sunlight, and developing with a weak iron developer (iron eight grains, acetic acid twenty minims) not too new, intensifying afterwards with pyro. and silver. The collodion, although it should not be in what would be called its best state (for portraits or views), should record the most delicate lines with great clearness and precision. Of course over-exposure, over-development, and everything which tends to mar the perfect transparency of the blacks, or destroy the more refined details of the graver, must be avoided,—pure white and clear blacks being the elements of success. (I feel ashamed to mention these simple things here, although they may be useful in some quarters, perhaps.) When the destruction of the print is of small consequence and the margin is very much torn, stained, or discoloured, this may of course be cut away and the print be placed against a piece of white board or paper for copying. In selecting a print for copying we should remember that there is a vast difference between a really good proof and those feeble, chalky impressions from worn-out plates which are to be found in the shops of cheap printsellers.

But copying engravings is a very simple matter compared with the

Copying of Paintings.

Here more real and tangible difficulties meet us — difficulties which in theory look so truly formidable that one can only wonder when in practice they are so gloriously overcome. The amazing success with which Mr. Thurston Thompson has reproduced the wonderful creations of Turner's genius in the specimens before us, must convince us that such difficulties only exist to be conquered. But the victory is not always *easily* won. It is only after long experience and many experiments that in photographing the more difficult paintings we succeed in making every step in the process a triumph over some enemy or another, until the end is gained—getting over this in the exposure, mastering that in the development, securing something else in the intensifying, and managing other points in the printing, so as eventually to secure what, after all, some worthy gentleman amateur, who has just mastered a shilling manual, and taken his fourth "picture" from nature, will perhaps sneeringly denounce as *only* a copy. Knowing that the bromides are more sensitive to the colours called non-actinic, and the iodides to those of the other end of the scale, it at once strikes us that the judicious combination of both, with reference to the warm or cold characteristics of the painting, is the most hopeful thing for success. In a general way the bromised collodion will give the most satisfactory results.

And here I must pause. The simple fact is that I have now only just time to lay down my pen and start for this evening's meeting—my paper, in consequence of the accumulating business of the Society's Exhibition, having been delayed until there was not sufficient time remaining for its conclusion. I must therefore beg your pardon, and come at once to a few experiments made to test the power of certain combinations of the iodides and bromides in rendering certain coloured diagrams.

I took a sample of collodion and bottled off twelve separate ounces in twelve small bottles. No. 1 contained five grains of bromide of cadmium and two and a-half grains of iodide of ammonium. No. 2 contained five grains of bromide of ammonium, No. 3 five grains of bromide of cadmium and two grains of iodide of potassium. No. 4 contained as much of the iodide of potassium as it would take up. No. 5 contained five grains of iodide of ammonium. No. 6 two and a-half grains of bromide of ammonium, and as much of the iodide of potassium as it would take up. No. 7 contained one grain of bromide of cadmium, ditto bromide of ammonium, and as much as it would take up of the iodide of potassium. No. 8 contained two grains of bromide of cadmium to as much of the iodide of potassium as would dissolve. No. 9 contained the same proportion of the iodide of potassium, with two and a-half grains of iodide of ammonium. No. 10 contained iodide of ammonium four grains, bromide of cadmium one grain, iodide of potassium and bromide of ammonium ditto. No. 11 held five grains of bromide of cadmium; and No. 12 one grain of bromide of cadmium, two grains of bromide of ammonium, and five grains of iodide of ammonium.

Desiring merely to test the qualities of these various samples for reproducing the correct *chiaroscuro* of the coloured diagrams, I simply developed with iron without intensifying, and shall now lay the result before you in the twelve negatives and twelve prints from the same.

In conclusion, I promise to resume this subject at some future time, when, my engagements being less numerous and urgent, I shall be able to devote a larger share of time and attention to some experiments of a more conclusive character. I think in the specimens of my experiments some foundation will be found in a discussion of greater value than my paper—even had it been completed—could have boasted.

Thanking you for your polite attention, I now place the subject in your hands.

MY FIRST PHOTOGRAPHIC TRIP TO THE COUNTRY.*

By a Member of the Edinburgh Photographic Society.

We retraced our steps. No jubilant contempt for the small boys this time! No turning up of our mental noses at their juvenile jokes! We had *over-exposed* ourselves too much for that. Fortunately for our peace of mind we found that they had moved away on their holiday-making—some to church and some to play. In twenty-five minutes from the time of reaching home we were off again with an entirely new batch of baths and solutions, lightened considerably of many of the superfluities, and the bottles and general *impedimenta* distributed as much as possible among our pockets; for we began to discover the truth of the axiom in physics, "that it is not so much the actual weight, but the concentration of it in one spot, that crushes the bearer," be he human, equine, or ruminal.

Our developing box was lighter, and we were much heavier in spirit when we again started. But the slight breeze that awaited us and the bright sunshine which tempered its coolness made our walk very pleasant. Before we had got one mile of the three that we had promised ourselves, notwithstanding all our care, we began to need a rest; and where could we more pleasantly spend an hour than in the little village of Bonnyneuk (a place of about a dozen houses)? Besides, it was so picturesque, and the number of "bits" to be had so many, that we cheated each other into the belief that we must try a plate or two, were it only to see if the new stuffs would work. Was there not a new bath (Hennah's, by-the-bye), and new developer, and untried collodion, and so on. On a willing mind persuasion acts easily, and we in a few minutes pitched our camp in a pasture field facing a highly-picturesque corner of the

* Concluded from page 111.

village. There was a partly broken-down outside stair, on which an "auld wife" sat nursing a baby, and a thatched gable, some carts on end, a barrow which had come to an untimely end, several farm tools, and a whole legion of juvenile joskins. Up we set the box on its legs: the rods were fitted, trays placed and everything made ready for the yellow cloth being thrown over it, when—*O tempora!*—one of the urchins pulled the "Corinthian's" coat, and quietly asked for a "hapenny work o' sugar bools!" Think of the immaculate Flake White — the nobby "Corinthian"—the R.A. of a year or two hence—being taken for a peripatetic vendor of children's "goodies!" It was too much. With an expletive more emphatic than polite he requested the youngster to be off; and as we heard the colloquy we burst into such a hilarious jolly fit that he was fain to join in our guffaws. But before we were well done with our laughter, up comes a deputation of the older children to know what we did sell if not "sweeties?" It was no use saying that we had nothing to sell, for, if we had nothing to sell, what did we need with *a stand?* We stood our ground against the host of inquisitive questions, and got the yellow cloth—bright with all the glories of gamboge or chrome—drawn over the stand.

I may mention that we had a firm opinion that all the books must be wrong in recommending black cloth over the yellow. Was I not great in chemical authority? and did I not know that yellow had no actinic action? and if so, what was the use of working in the dark? Besides, had I not tried the box in my own room, to the great detriment, I confess, of sundry "anti-macassars," &c.? So of course it must be all right.

To work we went. "Hercules" got the picture focussed and the figures arranged with the help of the "Corinthian." I got the plate ready and exposed it. I must here abridge all the difficulties we had of explaining to the said "figures" that we only wanted a picture of them—a matter we could hardly get them to understand. The ancient dame with the child wanted to know what we could want wi' a pictur' o' auld John Tamson's byre an' granary? and as for hersel', what wad she do in a picture? The picture was exposed, and I disappeared, head and shoulders, into the tent, and developed a fair-looking picture, which, however, appeared remarkably white, and when brought to the light and fixed showed a dense veil of fog. Then came the usual string of interrogatories. Was it the bath? or the developer? or the collodion? We tested for each, and still no results, or rather not a whit better, till, trying a last plate, and holding my head up, wondering what could be the matter, and staring right up, I felt somewhat astonished to meet some direct rays of the sun through our immaculate new yellow cloth. *Peste!* was it not annoying to lose two hours of the best of the day and have no results? However, to work we went, and wrapped a large plaid round it, leaving here and there a corner for light; and now we found the work go on well. The next plate after that was all right, but, on consulting our watches, as well perhaps as our inclinations, we found there was no time to go to our old castle; so we moved our camp a little nearer, and having succeeded in interesting one of our villagers by portraitising her eldest and youngest "hopes" as accompaniments to "a cottage door" group, we got a roomy dark place used as a hen house to employ as a dark room, and plenty of water. We proceeded to make the best use of our time. I need not detail the whole of the plates covered, but will mention two. We had succeeded in getting a picture of an exceedingly fine patriarchal goat, which by some occult means had persuaded himself to stand steadily and quietly for a couple of minutes beside the girl who held him. It was a superb picture, with the corner of a lately-shorn wheat field, a ragged thorn, and the mountains beyond looming hazily in the distance: everything about it was perfect, even to the apparent browsing of the goat, which after all was only the old patriarch stretching his head to reach the grass—a feat which he did not accomplish. I proceeded with the development, and had brought it just about right: one more drop of silver and it would be complete, when—birr—splutter—went one of our good dame's hens, which had been on the roost unknown to any of us, right over the plate I held in my hand, and need I say that the "counterfeit presentment" of our friend the billy-goat was obliterated in the flapping of a wing. This was a complete disheartener. We announced to our friends that we would take but one more picture, and then be gone. There was a general demand among the villagers that we should take their "pictures:" so we agreed to try a group of as many as chose to stand, they having been very kind to us.

"Now is the chance for you my future R.A.'s," said I. "Show your power of skilful disposition of figures: you never had such an opportunity!" To work we all went: they to arrange and dispose the material, I to get the plate ready. When this was done, and our favourite the goat put just in the proper place—(you should have seen the patriarchal gravity with which the bearded and long-horned gazed with his mild eyes at our preparations, looking all the time as humble as a sheep)—I uncovered the lens, and stood with my back to the group, for fear of disturbing any of them. I had been in this position for twenty-five seconds (I like to be particular), when I heard a shout from Emerald Green of "Look out, camera!" I half turned, but it was only in time to see the goat, which had broken from the little girl, running full tilt against the person of the "Corinthian," who stood beside our developing box. Down went he and it, and, in the rush forward to save it from destruction, I kicked the legs from the tripod, tripped myself over the prostrate form of Mr. Flake White, and received the weight of the lens and camera on my legs, which saved it, while all else was apparently smashed. "Hercules" lifted me up (after the camera, by-the-bye): the "Corinthian" managed to scramble from between the lid and legs of the box, and found himself but little the worse. My knee was sprained. The tent was not injured, the shock having merely jerked out the supporting rods and caused it to collapse; but the negatives we had taken that day were in it, and, with the exception of one, were all smashed.

I can say no more. I leave you to imagine the picking up of the pieces—the limping home crestfallen—and, when there, having to describe how all the results of our long-boasted first day's photographic trip had "vanished, nor left a wreck behind"—save the lesson we received!

HINTS ON THE NATURE OF PICTORIAL BEAUTY AND THE PRINCIPLES OF COMPOSITION.*

By W. H. Davies.

Part II.

The previous portion of this subject was unavoidably curtailed, owing to press of business on the night on which it was read. To prevent me again occupying you too long I will refer in detail to one only of the subjects containing three figures of the class to be avoided, and for the present leave it.

Compositions of three figures have always been favourites with artists, ancient and modern; but I doubt much whether a search through all the galleries and portfolios in Europe would produce a match to this specimen of good photography and bad composition: and it is by no means an exceptional case. The portraits, as you see, are those of three smart school-boys—brothers. I cannot call it a group of them, for they are not grouped; nor a picture, for it has very few pictorial attributes; nor a composition, for it is not composed. However, there they stand, each in the same dress, and each with his necktie in the same uncreased folds: their belts at the regulation height—all in the same attitude—all staring full front at you: each with the first button of his tunic reflecting a spot of white, and, by a strange coincidence, the last buttons repeat the spots of the first as if to order, the intermediate being dark. Each holds his books in the right hand and the edge of the tunic in the left—the left-hand boy being varied very slightly; and, as if the upright figures of the boys were insufficient to secure perpendicularity, we have here introduced the photographic pillar on one side and the as inevitable photographic curtain on the other, securing in this way the rectangularity of the design. Thus we have five perpendiculars, inclusive of the pillar and curtain; and at right angles to these—1st, the dark line of the Balmoral bonnets of the same pattern; 2nd, the light line of faces; 3rd, the dark line of neckties; 4th, the bright white of the linen collars, newly starched for the occasion; 5th, the line of white spots reflected by the top button of the tunic; 6th, the dark centre line of their belts; 7th, the line of light formed by their hands and the light reflected from the lowermost buttons; and 8th, finishing with the dark line of shadow below, which is hardly broken by the slightly-patterned carpet on which they stand—the whole forming a complete series of rectangular lines, without a single curve or irregular line in the picture, and the boys being so like each other one cannot help comparing them to the Siamese triplets—not twins. Think you Mulready, or Collins, or Wilkie, or Webster would have so maltreated those fine boys? Never! I could show you what they have done with similar boys, and depend upon it it was nothing like this. They have taken more trouble with the arrangement of their pictures—have put thought into them—studied the composition, the light and shade, the pictorial effect of them—made

* Read at a meeting of the Edinburgh Photographic Society, March 5th, 1862.

pictures of their boys, in short—not mere front elevations of them, as this is.

I know that objection will be taken to the trouble and expense involved in taking so much care as I insist on with a mere 10s. or 20s. group of portraits. Why not place them in front of the lens—take them at once—and be done with them? But, if such giants in art as Titian and Tintoretto, Vandyke and Rembrandt did not disdain to study and practise the laws of composition, think you they would have made the name or fame or (let me whisper it) *cash* they did? Why, Titian records of one picture that he did a little to it every day for seven years till it satisfied him. Of Mulready, one of our greatest living artists, it is recorded that he kept one of his pictures beside him thirty years, always doing a little to it till he thought it complete. While, with more immediate reference to portraiture, Deschamps tells us that Rembrandt's sitters were compelled to wait patiently his long intervals of indecision as to choice of position, dress, attitude—in fact, till he had *invented* the picture; and that his sitters might consider themselves fortunate if they escaped some cutting sarcasm from Rembrandt if they objected to the pose or arrangement he chose for them, as he always expected that every model should submit quietly to his notions, or renounce the honour of forming the subject of one of his immortal masterpieces.

The inference I would have you draw from these facts is, that the utmost stretch of skill the photographer has should be used in all his productions, and that the best technical workmanship is as nothing against the want of artistic knowledge; and if he has not as yet mastered the elementary laws of composition he should begin now. "It is never too late to learn," for, when you are arranging a picture, it is as easy to do it well as ill, if you have the requisite knowledge, taste, and skill.

The third proposition or principle—"that the picture be so arranged as to its light and shade that the principal figure or incident comes naturally to occupy the most prominent part of the picture, and the secondary portions to subside by due gradation and subordination into their respective positions, so that it may produce a perfect whole"—seems almost like an axiom; but our worthy Secretary's orders are to treat the subject as if the whole of the members of the Society were profoundly ignorant of the subject, therefore bear with me while I urge the necessity of this almost self-evident proposition.

Photographs are different from pictures produced by hand mainly in their fine detail and finish. The exquisite gradation which the shadows from natural objects take in the camera are unapproachable by any hand-work of man's that I know of; and, from the earliest ages of painting till Turner's time—Claude, perhaps, excepted—no artist had succeeded in giving a proper rendering of the truth of nature, and even he failed to give all its infinite gradations. So that if we would view a true reflex of nature we must go to the glass screen of the camera: there it will be seen that the shadows of objects, whatever may be their colour, are deepest and strongest in the immediate foreground, and that they gradually get lighter as the extreme distance is approached by the eye till they disappear in the uniform grey, blue, or purple of the distance. The most prominent part of such a picture as I have indicated would be near the foreground, where the brightest light in the picture was in contact or proximity to the deepest shade; but the position in which this comes in the picture on the ground-glass may not be the point needed by the artist for his composition, and it then becomes his business to arrange his subject so that this indispensable matter may be made right, and the most prominent object in the subject to be arranged or composed brought to the place most suited for it. Suppose, for instance, that a portrait is the subject: what we want to see in it is—firstly, the head and face; and, secondarily, the figure and dress of the person. We want to know him in the portrait as we do in the life; and, to arrive at this, we make the most essential part, the head, to take the principal position on the plate, and, if we have the assistance of the whiteness of a shirt-front or a lace collar, to call immediate attention to it, we, in addition, gain the value of contrast between it and the delicate half-tints of the face, while the whole forms but one mass of light; and we keep down or subdue the rest of the person in order that the dress and other unimportant *et ceteras* do not fight for precedence with the principal. The face being a light object, we cause the background behind to be darker, in order to get the effect of relief. Were a tint the same as the face chosen, it would necessarily have the effect of being inlaid—be a drawing, as it were, of a face on the background. The same principle carried through the picture—always keeping in mind that there must be no brighter or more strongly contrasted mass than the face, and subordinating all the rest to that—will give you an effective picture. It were well to bear in mind that the most prominent tints are the lightest, and the most retiring the darkest; and that in a properly-balanced composition the portions of absolute white and absolute black should be almost infinitessimal.

Having thus summarised the leading propositions, we will pass the secondary principles shortly in review before attempting to apply them to finished compositions.

PICTURESQUENESS is the first of these, and is a term of rather difficult definition in words, although there are few things more easy than that of determining its presence in pictures by those who know what it is. It does not depend on the presence or absence of one or more objects in a picture, but rather in the arrangement of them, and in the point of view from which they are taken; and not alone these but also in the forms of the objects themselves. In the paper I read before you on landscape composition (vol. VIII., page 396), I tried to show that it was in the avoidance of strictly rectangular and parallel lines, and in the use of curved, wavy, and opposing lines, keeping in view that the objects themselves should be treated as if they were lines. This is the groundwork of picturesque combinations. We must have repetition of these lines through the picture; but they must be varied in value, each repetition being fainter and more of an echo, as it were, of the original or main line. To give these value there must be opposition of other lines in different directions, and it is by a judicious use of these that we secure picturesqueness of form. There must be balance in a picture; but it must be the balance of parts and masses rather than of forms. Above all, there must be variety of line, of form, of plane, and in another direction of position of expression, of occupation, of character, and of size; and with all these, unless you have true harmony and opposition both of parts and of light and shade there will be no picturesqueness and little beauty. Withal, there is no general recipe for any of these qualities, and picturesqueness may be called, paradoxically, one of the intangible attributes which is felt rather than seen, and easier to be seen than taught. You cannot have a better idea of what picturesqueness is than by taking a look at a sketch by Turner and at another by an architect's journeyman of the same place. The artist would tell you all about it—what it had been—what it was—and give a hint of what it was coming to. The other would give you the hard details and dry outlines of the spot—much as a verbal and verbose topographical dictionary might do; while the artist, by his disposition of light, his exquisite gradation of tint, his aërial perspective, and arrangement of figures just in the right place, would give it all the charm of a poem or a romance without losing the truth.

BREADTH I have mentioned as the second of the subordinate principles necessary to be observed in artistic composition, and it has in common with picturesqueness the quality of intangibility. I have defined it as that quality which gives a picture unity of treatment, harmonious arrangements of the places and forms of lights and darks, and which concentrates or masses them, instead of allowing them to be scattered over the picture in a spotty manner. Breadth is the opposite of weak scattered effect: it gives largeness and space in a picture whether its size be measured by feet or by inches. In photography its results are best obtained by attention to these requirements; and, when the subject is well chosen, there is hardly a limit to the ranging of the eye over the expanse of the landscape where, with an infinity of objects intricately involved, all are seen without the slightest confusion. You will recollect that in speaking of light and shade I urged the necessity of keeping the principal place of the picture for the principal object, and showed that with one simple light on a portrait we would get an effective picture: this would also have great breadth. But if we have more than one mass of light there must be three, and on the management of those lights will depend the amount of breadth attainable in the picture. The same rule as to the shape of the lights applies equally in figures and in landscape. As a general rule avoid giving prominence to minute detail in the foreground—especially if it be of a spotty or sparkling character—and cause the general effects of the picture to predominate over those of the details. By attending to this in the taking of the negative, and if spots are unavoidable—as is often the case—by toning them down with a pencil of sunlight, we will obtain the desirable quality of breadth.

I have defined the third of these subsidiary principles, CONTRAST, to be the mode of producing relief by projecting light against dark and dark against light, or light against lighter and dark against darker. In photographs contrast is often too easily got to the great detriment of the harmony and completeness of the picture,

more especially if it has been taken in sunlight, where we most generally find our lights and shadows intensified, thus causing a greater appearance of contrast than is to be found in nature, especially as the different colours do not affect the chemical surface equally. Excess of contrast is utterly destructive of breadth; but by its judicious use we may, like Rembrandt, give intensity to our lights and depth to our darks. The more delicate the contrasts we can produce the better, inasmuch as much of the beauty of a picture depends on the delicacy of its contrasts.

This, however, may be better discussed under the remaining head, GRADATION, which name expresses almost all that it is. The infinite number of shades between white and black, with all the various tones from brown-red to slate-blue which we can get in photography, allow of such a scale of variety that we can be at no loss either for gradation or tone. The camera lens is for us the true softener of lights and shades, and is the cunning workman who traces the delicate shadows on the roundness of beauty's cheek or on the dimples of innocent childhood, with such subtlety that we have nothing left to desire, and can only wonder at the exceeding accuracy of the result; but, while we are enabled to do this so perfectly, we have limits laid down which we have not yet reached. The loveliness of the sky, with its marvellous kaleidoscope of cloudland, is almost a *terra incognita* to us: we are approaching to it, but have yet made nought but shadows of its wondrous beauty. The beautiful foliage of the forest, the park, or the garden is almost equally unrepresented; and it is in the fading and melting of one tint and shade into another till they reach the line where they melt into sky and there begin a new succession of gradations of ever-varying beauty that we find our greatest difficulty, and of which we have made but slight progress in representing.

We have thus dismissed the fundamentals with which we started, and will now return to our task of dissection; for, in the artistic as in the medical and physical world, there can be no reconstruction without having discovered the "how to do it." We must analyse before we can recombine with anything approaching certainty; and, as I have before remarked, this must be done by the aid of rules such as I have endeavoured to show. Sir Joshua Reynolds says "that rules only encumber the weak, and that nothing can be repeated with certainty unless it follow some well-known rule." The pictures I have chosen for this purpose have been selected with a view to their being serviceable in the arrangement of photographic groups, and the first is that by Joseph Noel Paton, entitled *Home*. It represents the return from the Crimea of a mutilated, weary, travel-soiled soldier to the home he has left but a short year before. His wife has swooned, overpowered by a mixed play of feeling, when, on attempting to embrace him, she discovers the absence of that arm he has left in the trenches of Sebastopol which should now have supported her. His mother, with quicker perception, has seen it at once, and is bowed with sorrow on his shoulder, while his child slumbers in contented ignorance in the cradle beyond. The time chosen is twilight, and the room is irradiated by the cheerful, ruddy blaze of the sea-coal fire. As it is mainly to the composition I intend to confine my remarks, no further notice will be taken of the invention, light and shade, or sentiment involved in the picture. It will be observed that the general shape of the composition is angular, and that the leading line being angular it is repeated three times, and slightly varied on each repetition: first in the nearest leg of the soldier, again in the leg beyond, and again in the line of the wife's figure, going off with varied curves and angles in her skirt and dress; but, as too many lines in that direction would be apt to make the whole composition fall over to that side of the picture, the artist has introduced the counteracting lines of the soldier's body and greatcoat and the bent figure of the stricken mother, which, with the square and somewhat rigid lines of the table in the right corner, carried up to the top of the picture by the bed curtains, assist to support the picture there. On reaching the ground the eye meets with an agreeably-curved object in the helmet, staff, and bundle, which give variety of line there and assist in filling the vacant space between the figure and the table, and produce the necessary contrast of form with the horizontal boarding of the floor and the perpendiculars of the table and greatcoat beside it. On the other side of the picture, the perpendicular is repeated by the projecting line of wall, the uniformity of which is broken by the clock, the mirror, and the cast shadow of the chair, and it is again variedly repeated and carried round by the latticed window and cabinet. The horizontal lines are begun in the immediate foreground by the flooring boards, are continued past the hearth, with its irregularly cracked surface, to the side of the picture, by the handle of the tongs, and which are again repeated, going upwards, by the distant chair, the slight oblique of the soldier's thighs, and curved-ended table in the right corner. You will observe that neither of these lines are so purely or rigidly horizontal as those of the floor, by which the requisite variety as well as uniformity is gained. As we still proceed upwards, the bracket on which the clock hangs, the shelves, and the cornice of the cabinet again repeat, in another variety of line, the horizontal direction, which the eye is finally led to lose in the distance by the inward crossing lines of the rafters leading it to the window and the distance beyond, which is reposing in the quietness of the descending night. Observe, too, that, in common with all good pictures, we have the inward tendency given to mostly all of the principal objects. The figures are all on different planes: so are the objects. There is no confusion: everything has its proper place and room as well as reason for its being there, and the whole composition recedes from the eye, just as it would do in nature, by reason of its admirable perspective and execution.



(To be concluded in our next.)

Exhibition Gossip.

ABOUT THE CLASSIFICATION QUESTION.

To resume our gossip.—When, somewhere about this time last year, we first read in the *Gazette* how all the productions of our beautiful art were to be classed with agricultural implements and ship's tackle in the World's Great Fair of 1862, how astounded and indignant we all were! What a cry went forth against the monstrous injustice of such an absurd classification! and how sure most of us felt that it must have originated in some mistake which would be speedily discovered and promptly rectified! Then, when we were at length convinced that there really was no mistake at all in the matter, and that the authorities resolutely adhered to their unreasonable decision, how glad we were to read the Lord Chief Baron's powerful protest, and to see the seemingly resolute opposition of the central society, and to find the different sections of the press speaking out very nearly unanimously on our behalf! As to what followed—why, "the least said the less to mend," and so let the past sleep undisturbed. I shall think my thoughts and be silent.

But let us glance at our art as it probably appears to those who, like the Commissioners, judge it from the view-point of an outsider. It is sometimes very interesting to try and see ourselves as others see us, and, moreover, it is generally very profitable when we can succeed in doing so.

John Bull is only too apt to associate his ideas about the real value of every mortal thing with what it represents in so much hard cash, and to narrow his conceptions of the great and good to the most high in price and the most rare in the markets. Now, photographs are certainly cheap, and they are by no means rare. Twenty-one shillings will purchase John B. twenty whole length portraits; and he may pick his favourite photographer from a vast crowd of anxious rivals. For a few shillings he can secure a larger specimen of the art, either a figure or a landscape subject; and the most ambitious and laboriously-produced works of the most skilful photographers rarely secure a sufficiently remunerative sale at one, two, or three guineas each. Some, I know, attribute this to the inferiority of photographic pictures as works of art, but they are mistaken. Large publishers will inform you that the commercial success of photographic publications can rarely be traced to their intrinsic merit as works of art, but rather to some novel

feature, or some interesting associations, or some connexion with passing events in which the public mind chances to be unusually interested. Vile pirated copies of *carte* portraits, and worthless stereographs, manufactured wholesale by armies of ill-paid boys and girls, pay much better than the slow, studious, and self-executed work of real artists engaged in striving to elevate and advance photography instead of building their temporary success upon its degradation. There are signs that the photographic market must be speedily glutted with these inferior productions, and when it is there will certainly be a change for the better. Public taste will then demand works of real excellence, and John Bull will not grudge that hire of which he knows the intellectual labourer to be so nobly worthy. To raise the standard of the art, then, is to advance the prosperity and welfare of its professors; and to encourage and stimulate all engaged in this generous labour is the duty of every true lover of photography.

Injudicious, thoughtless friends are frequently as mischievous as actual enemies; and in photography we have a large class of operators and writers who do no small mischief in this direction. These will persist in talking, within hearing of John Bull, as if the process was the one thing needful, and every imaginable excellence was due to the proper condition of the chemicals and simple mechanical skill. I read in these pages, not long since, how at a meeting of the *Birmingham Photographic Society* one of its members* coolly attributed the great success of the late *Mr. Lacy* to—*mirabile dictu!*—to *the skilful manner in which he flowed the developer over his plate!!* Being very familiar with Mr. Lacy's peculiarities of manipulation—and knowing how in the dark room his mind was ever too absorbed in studying the growing details, half-tones, and general pictorial effects of his negatives, sometimes even to give *sufficient* thought to the manipulatory processes, although these are gone through almost instinctively by the practised hand—the Birmingham gentleman's funny remark was, I can assure you, very amusing indeed both to me and to others as familiar with Mr. Lacy, who was far too good an artist to give the hand precedence over the head. Another writer, recently, following, as I was sorry to see, in the steps of an active friend-foe and "brother secretary," seems to recognise photographers as belonging to two classes only—the scientific or experimental, and the practical or mechanical—ignoring altogether the third and most important class, viz., the artist. As Lake Price once said—"The practical result—without which the art would remain an optical and chemical theorem—is *a picture;*" and it is something more than scientific accuracy of formula and mechanical dexterity of hand which are required in its production, or else photography has small right to the claim we advance for it as an intellectual, fine, or beautiful art. John Bull never hears the scientific discoverer of new pigments lauded as the real producer of his artists' paintings—he never hears the painter speak of any great work of art as due solely to skilful stippling or an ingenious method of putting on colour; and yet both stippling and putting on colour are certainly not less difficult than coating a plate or sweeping on the developer, &c. So when he hears from the mouths of photographers themselves that in such gigantic efforts of the intellect as the mere acts of exposing, developing, and printing require, the greatest difficulties of our art are found—and that these thoroughly surmounted, perfection stares you in the face—why what wonder if John Bull shrugs his shoulders and says decidedly—"photography is *not a fine art.*"

But John Bull's great leading authorities in all questions of art are the R.A.'s, whose decision is said to have ruled the Commissioners in their very strange classification. Now, in relation to this question, it may not be amiss if we just glance back to a little matter of history in connexion with the R.A.'s, or what the late deeply-lamented Prince Consort used to call "the aristocracy of art."

The controversy between the Photographic Societies and the Exhibition Commissioners cannot but remind all who may be acquainted with art-history of the once hotly-fought battle which raged between the Royal Academicians and the engravers, and which thus fell out:—Four artists, from four different nations—but never an engraver amongst the four—each and all being duly shielded under the benign protection of George the Third, formed the original constitution and organised the first laws of our Royal Academy. And they agreed amongst themselves that engraving was not a fine but a mechanical art; and was, therefore, to be excluded from their aristocratic circle. Thereupon, the engravers banded together and proclaimed war.

At that time a more kindly and republican spirit of brotherhood united foreign artists, by whom engravers were recognised and received into their older and more stable academies, as younger and less ambitious, but nevertheless very worthy, brethren. But with a contempt for all foreigners, which was quite British in its quality, the newly-fledged academicians scornfully said, when this was urged as a precedent for them:—"The example of foreign academies can have no weight in the argument, because they are constituted on a wrong principle, and maintained by the funds and under the dictation of Government." In other words, the foreign societies were all wrong and they alone were right. But the engravers—who were not at all inclined to give vent to their protest and then relapse into supineness and inaction—fought on; and, gaining their ground inch by inch, at length, by words and works, won the general public to their side. To satisfy the public, the academicians then cried out, with a firm well-grounded faith in popular ignorance of art matters, that this part of their institution was based upon a law regulating the Royal Academy of Painting at Paris—the academy "constituted on a wrong principle!" Anything for a quiet life. But not so. No peace for the wicked: no peace until you become just and do right! cried the engravers. And they soon proved this rash assertion to be a simple falsehood—a mere attempt at imposition. But, when driven from their Parisian stronghold, the bewildered academicians cried out—Oh no! they meant not the Paris Academy—of course not—but that of St. Luke at Rome! Then, again, cried the unyielding engravers—If you go to Rome, do as Rome does! and showed how at that very Academy of St. Luke its members had overruled the old laws of their institution, and, in a full assembly of their body, admitted an engraver purely upon his merit as an engraver. And then the academicians of London did as certain ladies are wont to do—that is to say, being unable to reason, they began to scold; and they abused engraving and engravers to their heart's content, calling the poor art "ignoble, mechanical, and contemptible"—said its followers were "men of no genius," mere "artisans," "servile copyers of other men's work," &c., &c.; in short, said exactly all those generous things of engraving and engravers which have been recently dug up and cleaned to look like new for the special benefit of photography and photographers. Still all was vain. Even abuse failed; and the poor academicians were at length reluctantly compelled to admit a few engravers as associates, taking good care, however, by the passing of a spick-and-span new law, to exclude them from the Royal Academy's lofty honours and great advantages.* The field was won, but yet it was but a barren victory: the engravers remained dissatisfied, and nine of their most celebrated brethren publicly pledged themselves "never to become candidates for election into that body of artists" until the value and status of their art was more honourably recognised. They eloquently and most loyally petitioned the King, but he only referred them to the academicians. Mr. John Landseer also appealed formally to the academicians, setting forth, *exactly* as we might set forth in a plea for photography, how the art was one of great national importance—how it was advantageous to commerce, and served to spread vastly and make more widely popular the arts of painting, sculpture, and architecture—and how it made the great artist of world-wide celebrity by its faithful reproductions. Then, after urging the necessity in so important an art of supplying "*that powerful stimulus of honourable distinction by which the progress of other arts have been* accelerated and ennobled," he cleverly used his soft-soap brush, and insinuatingly added "*inferior* men—mistaking the present for the possible state of engraving" (or, as we might say, photography)—"might confirm the degradation of the art in England by stamping it with the reproach of an art without theory—if such a thing might be—and fixing it in the condition of a mere trade, obedient to the beck and subservient to the views of ignorance and avarice." But they—the *superior* men—recognising the advantage of uniting the manual and mental applications of the art, would, said Mr. Landseer, purify a stream "which should communicate a just and general taste in all the arts to the public at large."†

As my end is now attained in calling your attention to what has been said and done for an art not one whit superior in either its commercial and educational importance or intellectual pretensions (and far more narrow in its applications) to that which this Journal represents, I shall leave off gossiping about the R.A.'s and the engravers for the present, and detain you only a little while longer. It is for us to raise photography—not the Commissioners—by encouraging and emulating and stimulating to renewed exertions

* A gentleman well known by his really beautiful productions, too.

* Abstract of the *Instrument of Institution of the Royal Academy of Arts.*

† The Academy has since abandoned the position described, although quite recently, and now elects two engravers academicians. Is not this good argument for our art? We have good firm ground under us and ought to hold it strongly, *malgre* all the Commissioners and R.A.'s in the kingdom.

such men as Rejlander, Lake Price, Robinson, Bedford, Mudd, Williams, Wilson, and others—feeling that it is to their patient and laborious study in producing works of high character to which we owe the best hopes for the future of our art. We shall not raise photography by making prominent the mechanical at the cost of the mental, nor by sneering down honourable rivalry and generous competition for artistic honours; but by recognising the high practical mission of the art, and bidding it God-speed before a good strong puff from the united breath of pictorial, optical, and chemical science.

Just before I go give me leave to read you—by way of a parting hint upon the importance of bringing the public up to your standard instead of going down to theirs—the following quotation from Lord Shaftesbury's "Letter Concerning the Art and Science of Design"*:—

"Without a public voice, knowingly guided and directed, there is nothing which can raise a true ambition in the artist—nothing which can exalt the genius of the workman, or make him emulous of after-fame, and of the approbation of his country and of posterity; for with these he naturally, as a freeman, must take part—in these he has a passionate concern and interest, raised in him by the same genius of liberty, the same laws and government, by which his property and the rewards of his pains and industry are secured to him and to his generations after him. Everything co-operates in such a state towards the improvement of the arts and sciences—and for the designing arts in particular, such as architecture, painting, and statuary. They are in a manner linked together: the taste of one kind brings naturally that of the others along with it. When the free spirit of a nation turns itself this way, judgments are formed, critics arise, the public eye and ear improve, a right taste prevails, and, in a manner, forces its way."

Many little matters concerning photography's progress in connexion with the Great Show were to have found their way into the present gossipping paper; but, as I think it is really quite long enough, adieu.—A. H. W.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at King's College on Tuesday the 1st instant,—James Glaisher, Esq., F.R.S., in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman said that, at the last meeting of the Society, it was decided, at the conclusion of the discussion as to a supplementary Exhibition under the auspices of this Society, that gentlemen who could obtain information as to the situation and cost of a room suitable for the purpose should kindly send the result of their inquiries to the Secretary. In the interval which had elapsed no such information had been received, and it had been decided in Council that evening to appoint a Committee for the purpose. The gentlemen who had been appointed were Messrs. Claudet, Heath, and Shadbolt, who, he doubted not, would exhaust the subject by their diligent investigations, and soon determine whether the Society was to have an Exhibition worthy of itself or not. The Council had desired him (the Chairman) to name this to the meeting as the final result of their deliberations.

The following gentlemen were then balloted for, and duly elected members of the Society:—Major Stuart Wortley, of Naples; Mr. Horatio Nelson King, of Bath.

Some photographs of the eclipse of December 31st, 1861, taken at Trinidad, were then exhibited by Mr. George Wharton Simpson. They were accompanied by the following letter:—

Dear Sir,—I beg to hand you for exhibition at the meeting this evening a series of photographs of the eclipse of December 31st, which I think will interest members present. They were forwarded to me from Trinidad, having been taken by Mr. William Tucker, of Guapo, whither that gentleman, together with Lieut. le Messurier and Messrs. Cauger, Devenish, and Anderson, had, at the suggestion of Mr. Hind, gone to take observations of the eclipse. Considering the arrangements for photography were entirely of an impromptu character, the results will be regarded, I think, as satisfactory. A quarter-plate camera was attached to a Lerebour's telescope, of a focal length of 61 centimetres (24 inches). The first contact occurred at 7h. 14′ 30″ a.m., and the first negative was taken at 7h. 19′. Ten others of different stages in the progress of the eclipse were taken, the last at 8h. 53′ 10″. The exposure was instantaneous with a collodion containing equal parts of iodide and bromide, developed by iron.—Yours, dear Sir, very truly,

GEO. WHARTON SIMPSON.

Hugh Diamond, Esq., M.D.
Secretary Photographic Society.

The Secretary said that it had been suggested to him that the Society should take a more active part in the presentation of petitions to Parliament on the subject of copyright in photography. When this was mentioned by the Secretary to the President, Sir Frederick Pollock, he (the Chief Baron) had replied that he thought the matter could be more advantageously brought before Parliament if he had an interview with the Solicitor-General on the subject. Several photographers had written to the Solicitor-General praying that the contemplated changes might not become law, as it would exercise a pernicious influence on their business. It had been found, however, on inquiry, that the writers were gentlemen (?) who reaped benefit from pirating the original productions of others.

Mr. England then read a paper descriptive of the method followed by himself in the production of the instantaneous views of Paris, &c., exhibited at the previous meeting of the Society. [See page 143.]

At the conclusion of the paper, the Chairman invited discussion on its subject matter; but, as no response was made, the Chairman, after a suitable pause, specially asked Mr. Shadbolt to open the discussion.

Mr. Shadbolt said he had nothing to add to the very able paper by Mr. England, which was sound in principle, and further had been proved to be so in practice. He would, however, remark in reference to the instantaneous shutter shown by Mr. England, that it was perhaps the best he (Mr. Shadbolt) had ever seen. He thought its peculiar merit consisted in placing it very near to the sensitive plate, a position which admitted of the whole of the lens being in use for every part of the image, while it had the further advantage of exposing *parts* of the picture in rapid succession. He thought those were points which did not receive the amount of attention of which they were worthy from photographers generally; but the advantage of the arrangement would become clear to the minds of all, upon a little consideration. That shutter reminded him of a somewhat similar arrangement suggested and used by Mr. Kibble, of Glasgow. The arrangement adopted by the latter gentleman differed from that then under examination only in having a lateral instead of a vertical motion; the object of which was to have the shutter moving in a direction exactly opposite to that of the objects in the picture—a plan found especially useful in taking instantaneous photographs of steamboats, &c. The advantage of the arrangement had not appeared so forcibly to Mr. Shadbolt's mind when first mentioned to him as now; but the recurrence of the subject that evening, and the examination of Mr. England's shutter, had convinced him (Mr. Shadbolt) that it was the best possible contrivance for the purpose. In reference to the remarks of Mr. England on instantaneous dry plates, he (Mr. Shadbolt) assumed that most members present were cognisant of the accounts published by Dr. Draper in America relative to instantaneous dry plates, he considered those accounts might safely be received *cum grano salis*, as it was quite likely that what the Americans called instantaneity might not accord with English views on the subject. Tannin plates had been obtained so sensitive as to take pictures with a few seconds' exposure; in this case, however, development by means of hot (140° F.) pyrogallic acid solution had been resorted to, and he was of opinion that, if that method were applied to the process described by Mr. England, pictures might thereby be obtained with much shorter exposures.

Mr. England had tried the effect of heat with the object of expediting the development. It had doubtless had that effect; but it at the same time melted the wax which he had placed round the edges to secure the films, and the result was the destruction of the picture.

The Chairman felt assured it was unnecessary to do more than hint at the propriety of thanking Mr. England for exhibiting his pictures at the last meeting and describing the method of production at the present one, in order to elicit a hearty response from the meeting. He (the Chairman) at one time was not very sanguine as to the production of dry plates suited for instantaneous photography; but after what he had heard that night he thought he might entertain a reasonable hope of seeing the desire of all earnest photographers fulfilled. He was sure the meeting would accord by acclamation its thanks to Mr. England for his interesting paper.

In reference to the photographs of the eclipse exhibited that evening, Mr. Shadbolt would be glad to have the Chairman's opinion as to whether he regarded them as good specimens of celestial photography.

The Chairman, in reply, said he had forborne making any remark upon them—first, because the arrangement by which they were taken was an impromptu one, and thereby not calculated to yield the best results; and, secondly, because observations of that kind were not of any practical value in an astronomical point of view. It was necessary that the eclipse should be an annular one for the results to be useful. He might briefly say that he did not consider the photographs good ones.

Mr. Shadbolt explained that his object in putting the question was not to throw discredit on the productions, but rather to elicit, for the advantage of the members, the opinion of a gentleman who could speak with authority on the subject. Mr. Shadbolt then drew the attention of the meeting to the alleged stereoscopic pictures supposed to have been executed in the sixteenth century by Jacopo Chimenti. He might say that he did so at the request of Dr. Carpenter, who had recently delivered a lecture at the London Institution, in which he had expressed opinions totally opposite to those held by Sir David Brewster; and he (Mr. Shadbolt) now desired to add his testimony to that of Dr. Carpenter, by saying that he had examined the photographic copies (which he then begged to hand round for examination) very carefully, both in the stereoscope and out of it, and he felt bound to say that though he had observed some little relief, it was by no means such as would be produced by any person drawing two pictures with a knowledge of the theory of binocular vision. [He then entered into details, for which see Leader, p. 141.] The explanation of the matter which he regarded as the most plausible was that suggested by Dr. Carpenter in his lecture, namely, that probably Chimenti and a student drew the pictures at the same time from a living model, from *nearly* the same point of view, and that the stereosity was an accident, occurring without the painters necessarily knowing anything of binocular vision.

*Published in 1773.

Mr. England said he had seen the original pictures in the Museum at Lille, and possessing as he did the power of uniting stereoscopic pictures without the aid of the instrument, he was of opinion that the apparent stereosity arose from the outlines of one picture having been traced from the other, and these outlines being slightly interfered with by the colouring in some parts having a little overlapped.

Professor Macdonald said he was present at the meeting when Sir David Brewster read his paper: he had obtained copies of the pictures from Sir David a day or two previous to the lecture, but had not yet separated them (he handed them to the Chairman). He (Professor Macdonald) possessed the same power as Mr. England in being able to unite stereoscopic pictures without the aid of the stereoscope. There was considerable misapprehension about the power of the stereoscope: the production of stereosity depended more on internal cerebral arrangement than was generally supposed. Dr. Carpenter had shown him some printed matter, arranged for the stereoscope, where an attempt had been made to produce duplicate effects, and yet some lines, when united in the instrument, produced a stereoscopic, while others produced a pseudoscopic effect. He (Professor Macdonald) accounted for this by the fact of the focal length of the two eyes seldom being the same. His own case was an illustration; and he thought this fact would, in some measure, account for some being able to see *these* pictures stereoscopically, while others could not.

Mr. Shadbolt asked if the pictures seen by Mr. England at Lille were coloured? The photographs bore no evidence of having been copied from anything coloured.

Mr. England replied in the affirmative.

The Chairman said that the want of agreement in the focal length of the eyes would not affect the power of seeing stereoscopically, as there was not one pair of eyes in a hundred the focal length of which were exactly the same; and yet by far the greater number of persons could see stereoscopically with the instrument, owing to the wonderful capability of adaptation to circumstances which the eye possessed. He (the Chairman) would remind the meeting of the experiment with a needle and a sheet of black paper, in which, if a circular hole were made in the paper by means of the needle, and the paper were brought *within* the focus of one eye having elliptical vision (the other being closed), the hole resolved itself into a *vertical* line, while if the paper were extended *beyond* the focus of the eye the hole became a *horizontal* line.

Mr. Shadbolt wished to observe, in reference to the remarks which had fallen from Professor Macdonald, that if persons who were able to see stereoscopic pictures, *as a rule*, were unable on examination of these pictures of Chimenti's to see them stereoscopically, they might fairly be regarded as non-stereoscopic; and in those cases, too, the Professor's observations relative to internal cerebral organisation did not apply.

The discussion on the above subject drawing to a close, the Chairman informed the meeting that an opinion had been expressed by the Society's Council that evening to the effect that it was very desirable that members should unite their efforts with the object of making the Society's meetings more interesting than they had been for some time past. It was thought that tables might be disposed in different parts of the rooms, with stereoscopes and other objects of photographic interest for examination by the members. Members themselves might furnish those and pictures illustrative of their varied experience. Altogether, he thought that a combined effort in the direction he had endeavoured to indicate could not but result in the advancement of the objects for which the Society was established; and he felt assured it would be undertaken "out of a common feeling of general good to all."

The Chairman then stated that at the next meeting, which would take place on the 6th May, Mr. Vernon Heath would read a paper *On Enlarged Photographs*. He (the Chairman) had much pleasure in announcing, however, that previous to that, namely, on the 25th of the present month, the Society would hold its annual *Soirée*; for which occasion the Secretary would be glad to receive objects of interest for exhibition on that evening.

The meeting was then adjourned.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at the City of London College, Leadenhall Street, on Thursday, the 10th inst.,—the Rev. F. F. Statham, the President, in the chair.

The minutes of the last meeting were read and confirmed.

Mr. Martin exhibited some highly successful stereographs by Mr. Alfred Pettitt, of Grasmere, Cumberland. Among them may be mentioned the graves of Wordsworth and Hartley Coleridge, as having considerable literary interest attaching to them; but the most remarkable, in a photographic point of view, were those which at a first glance were scarcely comprehensible, so incongruous did the shapes appear, and yet on introduction into the stereoscope they resolved themselves into the most brilliantly-transparent stalactites of ice. These stereographs elicited general admiration.

Mr. J. J. Cole exhibited some stereographs contained in cases so constructed as to give the idea of a book. The cases were much admired.

The following gentlemen were elected members of the Society:—Messrs. Lloyd, J. Macarty, and W. Larchin.

Mr. T. S. Davis said he announced with pleasure to the meeting that such arrangements had been made with the Crystal Palace Company as were calculated to ensure a successful result in the matter undertaken by the Society. The Sub-Committee were, however, still desirous of enlisting the co-operation of other societies and of individual members of this one in order to secure an Exhibition in every way worthy of the position which the art of photography had attained.

The President announced that the *soirée* of the Photographic Society of London was appointed to take place at King's College on Friday, the 25th instant, and that the Secretary, Dr. Diamond, had kindly promised that any members of that Society desirous of attending should have cards of invitation forwarded to them on forwarding their names and addresses to Mr. Simpson.

Mr. Davis proposed, and Mr. Wall seconded, a vote of thanks to Dr. Diamond and the Council of the Society for their kind invitation. The motion was passed unanimously.

Mr. Wall (the Secretary) having been called on for his paper *On Photographic Reproductions*—[see page 145]—said he must preface it by an apology for its incompleteness, which arose from the number of calls which had been made upon his time in connexion with the organisation of the Crystal Palace Exhibition.

About midway in the reading of his paper, Mr. Wall paused to exhibit some photographs of rare excellence obtained by Mr. J. J. Cole, through the kindness of Mr. Thurston Thompson, whose productions they were. They consisted of a series of copies of some of Turner's most celebrated pictures, taken direct from the original oil paintings, as also some interesting copies of *terra cotta* bas-reliefs. The Turners were shown on this occasion for the first time in public, and called forth the warmest expressions in favour of their high merit. Special attention was directed by the Secretary to the copy of the *Ship on Fire*, as being an illustration of the difficulties in copying from oil paintings successfully overcome, as those who had seen the original would doubtless remember that the amount of red and yellow which it contained was very remarkable.

At the conclusion of the paper the President intimated that the thanks of the meeting were due to the Secretary for his important paper, and also to Mr. Thurston Thompson for the valuable assistance he had rendered in allowing the lecture to be illustrated with such appropriate photographs. In reference to that he might observe that Mr. Thompson had caused the pictures to be specially mounted for the occasion, and that the meeting was consequently in the position of a jury, called on to express an opinion as to their merits. He felt assured that that opinion would be unanimously in their favour, since he was of opinion if the great artist himself had attempted a copy in sepia he could not have succeeded better than Mr. Thompson in reproducing every detail and general effect by photography. He (the President) thought Turner's pictures the most difficult to copy photographically; but since *they* had been done so successfully, he thought it would be comparatively easy to reproduce the paintings of other artists.

The succeeding discussion having assumed a conversational character, confined particularly to the artistic merits of Turner's productions, the meeting was recalled to a sense of its photographic duties by

Mr. Howard, who said that, if offered a choice, he should have preferred copies of such paintings as Webster's, and others, possessing greater distinctness of detail than those of Turner's. He (Mr. Howard) was of opinion that the want of distinctness in the pictures then before the meeting was one of the points which prevented them from becoming popular.

The President agreed with the latter part of Mr. Howard's remarks, and, in reply to some observations by Mr. Davis, said he should be sorry if any remarks of his should be taken to imply an undervaluing of the productions of our English Claude. He referred especially to the suitableness of Turner's pictures to show the triumph of photography in overcoming, not only the difficulties inherent in the reproduction of *any* oil painting, but even in the very indistinct ones of Turner, desiring it to be inferred that if those could be successfully copied surely those of other artists could be reproduced with comparative facility. The Chairman then invited discussion on the other portions of Mr. Wall's paper.

Mr. Martin said he should like to ask Mr. Wall what effect was produced on old engravings intended to be copied when treated with the mixture of hydrochloric acid and red oxide of lead, described in his paper?

Mr. Wall replied that the yellow tint of age was entirely removed, and the blacks appeared to be brightened and intensified.

The President asked Mr. Wall to which of the twelve mixtures enumerated in his paper he gave the preference?

Mr. Wall was not quite prepared to give an unconditional preference to any one combination. He thought they possessed special advantages suitable for a variety of circumstances, and required only the exercise of judgment in their application.

Mr. Simpson, in reply to a question, remarked that, although Mr. Thompson had not published his method of manipulating, it might reasonably be inferred that it was not widely different from that adopted by other operators who had obtained equally successful results. Mr. Simpson further stated, in compliance with a request from Mr. Fitch, that his experience in that department of photography was not extensive: he could, however, recommend with confidence the use of bromo-iodised collodion in reproducing any dark oil painting. He (Mr. Simpson) had that morning made an experiment to verify one which he had made some years ago, and had found bromide of silver alone less sensitive to light

than iodide alone, and that a combination of bromides and iodides was more sensitive than either. With an exposure of four minutes in full aperture of a portrait lens he had not obtained a trace of a picture with bromide alone, but with one grain of bromide and four grains of iodide he had had a good impression.

Mr. Davis said that when the subject of collodion was under the consideration of the Council of the Central Society, Mr. Hardwich had recommended a collodion prepared with French pyroxyline iodised with a mixture of bromides and iodides. From his (Mr. Davis's) own experience he should recommend an old collodion for copying large pictures, as in that case the light was so much reduced that long development was necessary to bring up the required intensity. Now old collodion would bear this without becoming fogged. He would therefore repeat that an old collodion in which some organic change had taken place was the best for the purpose.

Mr. Blanchard was of opinion that one of the features in the method of Mr. Thompson was, that he placed the painting to be copied in the same relation to the source of light as was originally intended by the painter; and that point he should be happy to demonstrate, if Mr. Wall would allow him to direct the attention of the members to that photograph which best illustrated his opinion. Mr. Blanchard then selected a photograph, which bore evidence of that peculiar *heaping up* of colour for which some of Turner's pictures were so remarkable. In doing this Mr. Blanchard said he considered that the success which had attended these reproductions was due in a great measure to that peculiarity of the artist. The quantity of colour laid on had produced shadows, occasioned by the pure light falling upon them in a proper direction, which at once redeemed the picture from anything like flatness. He (Mr. Blanchard) had further ascertained, by his own experience, that it was imperatively necessary that everything opposite the picture should be darkened, so that the direct sunlight should fall upon the picture only in one direction. With regard to the kind of collodion to be used, he could say that he had not observed that the use of bromides had given a very marked increase of sensibility: their chief advantage, and the secret of success in their use, arose from the tendency which they had to *lessen contrast*. He believed Mr. Thompson used equal parts of bromide and iodide; and he (Mr. Blanchard) felt assured, from his own experience, that all those copies were done in direct sunshine, and that Mr. Thompson would never waste his time in attempting them by any other light.

Mr. Simpson, in corroboration of the opinion expressed by Mr. Blanchard, said that in copying the Cartoons at Hampton Court Mr. Thompson had had them placed outside in the open air. He (Mr. Simpson) was loath, however, to admit that the only pyroxyline suitable for the purpose was obtainable in Paris, though it must be admitted that Mr. England had expressed himself to the same effect in reference to pyroxyline suitable for his purpose.

Mr. Blanchard, in continuation of his remarks, said that the greatest brilliancy was generally obtainable when the light impinged on the picture at a long angle. That plan, however, was not applicable to Turner's pictures, where the colour was laid on so thick. It would be found in practice that separate arrangements and experiments had to be made for each picture.

Mr. Davis remarked that he had been very successful in his reproductions since he had used a Dallmeyer's triplet.

Mr. Wall said he had received a letter from Mr. Maddison corroborating the statement made by Mr. Davis.

Mr. Howard would remind the meeting that excellent copies of maps were exhibited at one of the London Photographic Society's Annual Exhibitions some years since, before triplets were thought of. That he mentioned for the encouragement of those who did not possess such an arrangement of lenses.

Mr. Harman asked Mr. Wall to state the proportions in the iodising compounds of the collodions used in taking numbers 1 and 7 of the photographs he exhibited, since he (Mr. Harman) regarded those as the most successful copies of the pictures.

Mr. Wall read the proportions given at page 146.

Mr. Blanchard, returning to the subject of bleaching old prints, asked Mr. Wall if he had tried chloride of lime?

A brisk discussion followed this question, in which Messrs. Wall, Davis, Martin, Blanchard, and the Chairman took part, the conclusion arrived at being that the effect produced depended on the bleaching action of chlorine,—Mr. Davis finally promising to experiment in that direction, and lay the result before the following meeting of the Society.

Mr. Simpson hoped that, notwithstanding the delay caused by adverse weather, some copies of the presentation print would be ready for distribution by the succeeding meeting of the Society.

Mr. Davis said he would take that opportunity of informing the Society that the experimental Committee intended experimenting on the use of warm developers, and how far they actually increased sensibility; and he expressed a desire that other members of the Society would institute similar experiments, and communicate the results to him (Mr. Davis), in order that they might be embodied in the report of the Committee.

The President asked if any steps had been taken with the view of bringing together the numerous foreign and English photographers who would visit London during the International Exhibition? He thought that the Parent Society should take the initiative in such a matter.

Mr. Wall was not aware of any arrangement being in progress with the object in view named by the President. He (Mr. Wall) was of opinion that it should be the result of the combined action of all the British photographic societies.

Mr. Blanchard having promised a paper *On the use of Bromides in Collodion*, the meeting was shortly after adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The fortnightly meeting of this Society was held on Wednesday, the 2nd inst. The chair was occupied by J. D. Marwick, Esq., President. There was a large attendance.

The following gentlemen were balloted for and admitted as members: — Stephen Adam, Esq., Afton Lodge; Isaac Anderson Henry, Esq., Trinity; J. C. Fraser, Esq., C. A., Register House; William Forrester, Esq., Treasurer, George Heriot's Hospital; Alexander Hill, Esq., Printseller to the Queen; R. M. Smith, Esq., Bellevue Crescent.

The meeting was devoted to an exhibition of portable tents for photography. These were explained by Mr. Nicol, who introduced the subject in the following remarks:—

On Portable Photographic Tents.

At the present time the great problem in photography is not how to take good pictures. Heath, Mudd, Wilson, and many others have already shown us how to do that. The great photographic riddle, to the reading of which all eyes are directed, and in which the hands of all photographic experimentalists are engaged, is a method of getting instantaneous pictures on dry plates; and, judging from what those hands and those eyes have already accomplished, I think it requires no great stretch of prophetic vision to say that, before the close of the forthcoming campaign, our dearest wish in this direction will be accomplished.

Believing this, as I do, you may think that the question of tents is rather an unnecessary occupation of your time; but it is not so, because we have not yet attained to the much-desired process, and our love for photography will not allow us to be idle while waiting for it. And besides, even if we already had it, there are still circumstances in which wet work would be desirable. A happy pic-nic in a lovely glen, the members of which in all probability could never again be got together, could not be trusted to even the most certain dry plate: we must see the actual negative beyond the reach of accident, and this the *wet* alone will enable us to do. In addition to this there is, to the out-and-out wet collodion man, a charm in the delightful springing into being of a wet picture that the dry process will never give, and which will always command numerous followers. On this account, then, I have thought it well to ask the Council to devote to me this evening, and hope to make it sufficiently interesting to justify it in acceding to my proposal.

My object in bringing the subject before you, and in exhibiting the various tents now in the room, is twofold. Photographers may be divided into two classes:—one with more money than inventive ingenuity, or perhaps I should say constructive ability; and the other with more constructive ability than money. By bringing together the productions of a number of the principal manufacturers who have turned their attention to this useful photographic appliance, I desire on the one hand to show those of the first class what has been done, and enable them, when they have made up their minds to buy, to select that which will answer their purposes best; and on the other hand, the members of the second class will, by comparing one with another, be able, when they set about constructing a tent for themselves, to pick out of each the best parts, and so succeed in making as nearly a perfect thing as their circumstances and ability will admit.

The difficulty of getting together a sufficient number of tents was greater than I anticipated. All the makers to whom I applied were very courteous, and several sent off their productions immediately. Some, however, stated that the demand was so great that they were in arrears, and could not comply with my request in time. Others were so busy with the preparations for the Great Exhibition that they could do nothing in tents just now. And one—Mr. H. Francis—refused to send anything, giving as his reason that some years ago he exhibited before the London Photographic Society a camera which one of the members of the Council a few days after patented in his own name, and that since then he had refused to let any of his productions come before any photographic society. This may or may not be strictly correct, but I am quite sure that Mr. Francis does not know the members of the Edinburgh Photographic Society, or he would decidedly have made an exception in your favour.

Tents as generally met with naturally divide themselves into two classes:—operating chambers into which the arms and head, or arms only, are put, and tents proper, large enough to admit the whole body of the operator. For the working of small plates the chamber is perhaps superior to the tent, as from its lightness and portability it is much more easily managed; but for large plates the tent is undoubtedly better. I have seen large plates successfully wrought in a chamber, but I am quite sure that any one who has experienced the comfort of having freedom of motion, and the ability to move about which a large tent gives, would never tie himself up to work a large plate in a chamber.

A number of chambers were then exhibited and their various peculiarities explained. Leake's, in consequence of its extreme lightness, was much admired, and Jeffery's also attracted attention. The latter

might be made a little stronger. A chamber shown by Mr. M'Glashon, in which the plate on which the prize picture was taken was prepared, was also very good. There were also a number of tents, each good in its way. Among others, Smartt's was considered very simple, roomy, and well ventilated. Mr. Nicol said that if the makers would line it with yellow instead of black, and reduce the price fifty per cent., they would confer a boon on photographers.

After an interesting discussion on the merits of the various tents exhibited, a vote of thanks to Mr. Nicol brought the meeting to a close.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting of this Society was held in the Religious Institution Rooms, on Thursday last, the 10th instant,—Mr. Andrew Mactear, Vice-President, in the chair.

After the minutes of the previous meeting were read and approved of, the Chairman called upon Mr. J. Jex Long to explain his new appliance, —*The Pneumatic Self-Regulating Filterer*. [Owing to the late hour at which Mr. Long's paper reached us we are obliged to leave it over till our next number.] By the aid of diagrams and a lucid description, as also by the exhibition of the apparatus in working order, the members of the Society were put in possession of a really simple, ingenious, and new application of apparatus already in every photographer's laboratory.

The members took occasion to compliment Mr. Long in very warm terms.

Mr. Long remarked, in reply, that if the apparatus found favour in their eyes, and the practical application of it proved beneficial, he was amply rewarded for any trouble he had been at in bringing the subject before their notice.

Mr. J. Spencer, jun., exhibited and explained a collodion filter, which was handed round and examined by the members, several of whom were already in possession of the apparatus, and testified to its utility. Regret was expressed that the name of the inventor of such a useful appliance was unknown.

Mr. Brown exhibited a portable tent which, he remarked, although home-made, was not his own contrivance. Its use was the best test of its value. He had used it on many occasions and found it exceedingly serviceable.

A conversation followed, during which different styles of portable tents were spoken of.

The Secretary (Mr. Ewing) said that, talking of tents, he thought their value could only be tested by actual trial, and the best means of establishing such was by having a holiday set apart for the purpose. He was sorry the photographers of Glasgow had allowed last year to pass without such a recess, seeing the midsummer holiday of the year previous had proved such a success. He would desire the Society, as a body, to recognise the propriety of having such a holiday.

The Chairman cordially agreed with Mr. Ewing, and requested that that gentleman would name a committee for the purpose of arranging a trip at which amateurs and professionals could attend.

Mr. Ewing then named five gentlemen, who expressed their willingness to act in concert.

Mr. Mactear gave notice of a motion for a new rule; after which he handed to the members present the presentation photographs, printed by Mr. Robertson from the negative by Mr. Brown.

These gentlemen were awarded a vote of thanks for the fulfilment of their promise.

After the usual compliment to the Chairman and gentlemen amateurs who exhibited on the occasion, the meeting separated.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

An ordinary meeting of this Society was held on Monday, the 31st ult. In the absence of M. Gabriel, M. Leon Vidal, Secretary of the Society, occupied the chair.

M. Teisseire, in the performance of the Secretary's duties, read the minutes of the previous meeting, which having been confirmed the President announced the following names of gentlemen newly elected as members of the Society:—MM. Pointier (active member); Bertier de Draguinan; Lamouroux fils, Calcutta; De Courcival, officer of French Chasseurs in Algeria; Captain Nicolas, of the *Genie*, at Toulon (corresponding members); MM. Millon, Melchior, Eymin Henri, Millon, M.D., Mecklenburg, Ferrier Poullin (subscribing members).

The President then commenced the opening of the correspondence of the month. He read, among other letters, one from Mr. Shadbolt, presenting to the Society, in the name of Mr. Greenwood, a copy of the *brochure*, in English, on the Tannin Process, by Major Russell.

M. Rey Gabriel, member of the Society, desired to undertake the translation of this little work.

Another letter from M. Courcival, officer in the regiment of French Chasseurs at Batna, expressed the desire which the writer had to join the Society, and promised occasional communications on the subject of his photographic experience.

A third communication was from M. Ernest Lacan, and was accompanied by a gift to the Society of the first proof of a medal, engraved after a design of which he was the author, representing in profile the three heads of MM. Niépce Nicephore, Daguerre, and Talbot, designed from authentic portraits which he had succeeded in collecting. M. Lacan promised to send to the Society an engraved copy of this medallion. This communication was received with acclamation.

A prospectus from M. Potonie, of Berlin, relative to the establishment of an International Photographic Exchange, was distributed among the members present.

The thanks of the Society were accorded to the above gentlemen for their gifts and promises.

The President, in speaking of the various monthly publications, called the attention of the members of the Society to the experiments which he had deemed worthy of attention in the various French and foreign journals sent to the Secretary of the Society during the last two months. He directed special attention to the experiments on dry collodion processes, which were frequently under discussion, more particularly in reference to the progress which had been made, which, according to English publications, had approached very near instantaniety. M. Vidal expressed a hope that this degree of perfection would soon be attained, and by a process of sufficiently constant character. He informed the Society that even in Marseilles itself some highly satisfactory trials had been made in that direction, and these would doubtless soon be communicated.

Passing to another class of subjects, M. Vidal called renewed attention to the question of property or copyright in photography. He was glad to be able to inform the Society that the British Parliament had been occupied in the passing of an act in which the art of photography would take its place by the side of the creative arts, and receive from English law a protection equal to that which would be accorded to the painter and the designer. The bill had passed its second reading, and its acceptance was then beyond a doubt.

The President desired the members to charge themselves, from time to time, with the preparation of a written report on the contents of the various photographic periodicals, which proposition was approved by the members.

M. Teisseire said he gladly undertook the task for the following meeting, so far as the French journals were concerned. M. Vidal promised to continue to inform the members on matters of interest contained in the foreign journals.

The President called on

M. Hudelot, who communicated the results of some experiments he had made by placing behind the collodionised plate black and white surfaces. The conclusions to which these experiments had led him were to the effect, that for a comparatively long exposure it was necessary to put behind the plate a black surface (velvet or cloth-paper for instance), and that for an instantaneous picture a white surface was necessary, or, better still, a highly burnished silver plate. He (M. Hudelot) also described the theory which had led him to these conclusions.

M. Teisseire exhibited positive proofs of some landscapes taken in the neighbourhood of Marseilles, which were remarkably successful, and elicited unfeigned admiration. The proofs were obtained from negatives on dry collodion, by the Taupenôt process. M. Teisseire was invited by the President to describe the details of a process which had enabled him to obtain results of such passing excellence, and which he seemed to accomplish with ease and certainty.

The President, in reviewing the explanation given by M. Teisseire, directed attention to the advantages possessed by the dry processes, and urged the members to make new efforts in that direction.

M. Eissot presented to the Society six reproductions of engravings, of which he was the author. These proofs were very successful, the printing of them, especially, being perfect.

M. E. Loire exhibited two portraits and some reproductions, which were new evidence of the steady progress he had made in the art.

The President, in the name of M. Guilleminot, of Paris, showed some iodised paper, prepared according to the Oppenheim process, and offered samples to those members who desired to try its qualities, simply stipulating that they should make known the results of their experiments at the next meeting of the Society. On behalf of the same gentleman he showed also samples of tinted mounts.

The President then asked permission to make a short communication in his own name. In spite of his numerous engagements he had gained time to try a few experiments on the vegetable substances best calculated to increase the sensibility of collodion, and, above all, to cause it to retain that sensibility. He had made comparative experiments on simply iodised collodion, and on the same collodions treated with a few drops of different essential oils. Oil of cloves, for instance, admitted of the production of a very sensitive collodion: it was the same with the oils of roses, citron, and others. Simply iodised collodion did not give an image in the dry state without an exceedingly long exposure.

The Society thanked MM. Hudelot, Teisseire, Eissot, Loire, Gabriel, Guilleminot, and Vidal, for their interesting communications.

The President proposed, in the name of the Commission, a project in reference to the general statistics of the art of photography in France. The statistical statement would comprise the whole range of this new art. It would come within its province to ascertain what new branches of industry had been opened up by photography—what were their different productions—what was the amount of capital engaged in the prosecution of those trades, and in the art of photography generally—what was the approximate number of practical photographers and amateurs — what were the various publications to which the new art had given birth—

what sales were effected — what was their commercial value — what were the applications of photography, &c., &c. The statistics thus obtained (continued the President) would prove that the art of photography was one more worthy of protection than had been hitherto deemed necessary, when, by the examination of statistics conscientiously prepared, it was shown that the special industries of that art deserved to be classed by their importance in the first rank of national industries. He desired the members to make, in reference to this subject, such notes as they thought best calculated to assist the Commission.

The project being put to the meeting, was adopted, and the Commission was desired to prepare a special report on the subject for the next meeting.

The PRESIDENT introduced another subject, which had been brought under discussion at the meetings of the Commission. The subject had reference to UNITY in photography. That (said M. Vidal) was a great question—the solution of which would be very advantageous to photography. Hitherto that *unity* had existed but partially: it was desirable that it should become more general in practice, as it had been attempted, for example, to bring about unity or uniformity in weights and measures. He (the President) directed the attention of other societies, both French and foreign, to the subject, and promised, so far as the feeble efforts of the Photographic Society of Marseilles were concerned, to state as soon as possible the basis of this unity which was so desirable, and henceforth to strive towards the realisation of that perfection by every possible means. The idea would be further elaborated and communicated to the Society, the object of the Commission being merely to mention it casually, if the expression might be allowed.

M. VIDAL (the President), before closing the meeting, thought it right to inform the members of the Society that the Horticultural Society of the Mouth of the Rhone and the Artistic Society had given in their unanimous adhesion to the project of Union of Societies of Encouragement. He then explained the project which the Society had formed in reference to a permanent Exhibition, and creating in that locality of united arts a photographic laboratory under the auspices and by the aid of the Photographic Society, without, however, the latter becoming financially involved. The laboratory would be under the director of an operator, who would have to reproduce all the engravings, sculptures, &c., deemed of sufficient interest to be exposed from time to time in the permanent Exhibition. The operator would prepare the course of public instruction in photography which would be carried out in the large room; he would give practical lessons to amateurs; he would prepare dry plates by the Taupenôt, tannin, and other processes; he would also sensitise positive paper and prepare the various products, which he would keep at the disposal of the members of the Photographic Society; he would further execute the enlargements from small negatives with which he might be entrusted, by means of an apparatus and appointments, *ad hoc*. He would have the superintendence and the direction of the experimental laboratory of the Society, and of the labours of verification of the special Committee. M. Vidal further remarked how much the art of photography and the advancement of the Society would be assisted by the existence of such an appointment as he had named.

The proposition, after some slight discussion, was unanimously approved of.

The meeting was shortly after adjourned.

AMERICAN INVENTIONS.

IN a recent number of *Humphrey's Journal* we find the following:—

A subscriber in New Jersey writes to us as follows:—

"In England they are saying a great deal just now about Sutton's panoramic lens, which, as I understand it, is for taking pictures to include 120° of the horizon at one operation; but it must be taken on a glass plate bent round to be all at once in focus, and that the printing press be also curved to the same shape as the glass. Is not this the idea?

"Now, if I am not mistaken, some years ago, when in Tennessee, I think I read in *Humphrey's Journal* about an instrument having been invented in New York by a Mr. Ross, a correspondent of *H. J.*, for a similar purpose, but not in any particular similar in construction to that of Sutton, if I recollect right. The American instrument was stated to be of the simplest description, having no box at all, and ought not to be called a camera, as it was only a 'block of wood with a long mortice in it, through which the light was admitted to the lens, and the picture was made on a flat glass plate.'

"This is certainly simple enough, if true—a flat glass being cheap and to be had anywhere, while a curved glass for Sutton's lens would have to be got from the original maker's, at the buyer's risk, and at a great expense. Now, what I would ask is—Did such an instrument ever exist? Or is it like the Hillotype, that had so very celebrated certificates of its existence from leading daguerreotypists of that day?

"Sheriffs, parsons, and many others, signed and certified to the existence of the Hillotype, and where is it now? Is this the case of the 'block of wood' instrument? If such an instrument exist in this country, in whose hands is it?—and why is it not known in New York galleries, if nowhere else? Surely it would be invaluable for taking large groups, which are so difficult with common lenses; or would not Sutton's answer for that purpose? The 'block of wood' was said to be capable of taking the whole circle of the horizon on three flat plates, and this is also claimed for Sutton's lens, although he has latterly drawn it back to 100°, or 20° less than one-third of the horizon. Where can a production of the wonderful 'block' be seen—if such exist—if the block itself be not accessible to ordinary mortals?

"Since writing the foregoing I have been assured, by an operator in Lewis's gallery, that the block instrument *does exist:* that there are more than one in existence, and that he has seen them, as well as pictures produced by them, both positives and negatives on glass—*flat glass plates*, —and that neither the instrument nor its productions can be bought, the latter being only given to the inventor's friends.

"I have *seen* two specimens—one one-third of the horizon, and another on three glasses containing the whole, exclusive of the overlapping where glasses join: the overlapping is about two inches.

"The inventor says everyone can invent one for himself; but the fact is, Mr. Sutton must get rid of his bent glass, as those I saw were flat. Can you not get him to give us some account of it?

"I have written this article for your journal, as not only myself, but many others, would be glad to hear that *Old* Jersey will have to try again before it beats New Jersey."

[Mr. Ross has the instrument, as our correspondent says, but he is not yet ready to give it to the public, or render any account of it whatever. He is, as some of our readers know, rather eccentric in his views of matters and things, and cannot be hurried in any way or shape—not even to gratify his brother photos.—ED. *H. J.*]

There are but few steps that have been taken in advancing our art that have not, according to Cousin Jonathan, been *first* accomplished on his side of the Atlantic; but, owing to his well-known modesty, he is always backward in bringing them into notice until they have become well established in what he calls the Old Country.

Now, touching this same panoramic lens, we certainly cannot be charged with sharing the enthusiasm of its inventor in supposing that it is destined to supersede all other lenses, but neither have we ever questioned its absolute novelty and its great ingenuity. It is so consonant with the Yankee character, also, that such productions should not be *purchaseable*. We also heard tell of this American instrument some two or three years back—surely time enough to have perfected it; but, like the Hillotype, we have little expectation of ever seeing it.

Scraps and Fragments.

CARTES DE VISITE.—We have been favoured by Mr. H. P. Robinson, of Leamington, the author of *Fading Away*, *Red Riding Hood*, and several other ideal art-photographs, with two of the most charming productions in the *carte* portrait style that we have hitherto seen. Besides being excellent as portraits and as photographs, they are truly works of art.

COPYRIGHT (WORKS OF ART) BILL.—On the 31st ult. this measure —so important to the interest of photographers—was read a third time and passed in the Lower House of the Legislature. In the Bill just printed for the House of Lords, the following important addition has been made to the first section:—"Provided also, that there shall not be any copyright under this Act, in any copy or repetition of any such painting, drawing, photograph, or negative of a photograph, after the copyright in the work itself so copied or repeated shall have ceased, either by the expiration of the period for which the copyright is hereby given, or because the same may not have been duly reserved to the author or acquired by any other person upon or before a sale or disposition of such work."

PHOTOGRAPHIC GOSSIP.—At the Architectural Exhibition a Mr. Skidmore has been trying—with some share of success—to prove that all stone architecture has been originally derived from *metal architecture*, some of his principal witnesses being photographs.——It is said the celebrated sculptures of fine old Worcester Cathedral are to be "*restored;*" and as restoration, in a case where so little remains, must literally mean the substitution of modern works as near the originals as guesses can take them, we ask anxiously has any one negatives of these interesting and invaluable relics of England's earliest art? Such negatives are likely to be earnestly asked for by architects and archæologists.——The present discussion about the site of the Holy Sepulchre, carried on in the *Art World* by Mr. Fergusson and Mr. Walter Thornbury, might be very much simplified by the production of photographs from the localities disputed about.——Speaking of the *Art World*, it is not a bad comparison that in which photographs of Halifax Chapel—from under-exposed, unsatisfactory negatives—are likened unto "smoked glass."—— We wonder who will photograph the opening ceremonial of the International Exhibition?——Ought we not to get a photograph of the beautiful State Paper Office before they pull it down?

PHOTOGRAPHING THE POWERS BELOW.—It is rather interesting to find that wherever human enterprise and energy create extraordinary monuments to their own honour and glory, photography is sure to have something to do with the matter. In the first trial journey of the contractors along the new underground railway in London, the notabilities—parliamentary, civic, commercial, &c.—in accordance with the above principle, were duly and properly photographed upon reaching the terminus—prints from the negatives taken being eagerly sought after as mementoes of the novel if not perilous transit.

GREEK AND EGYPTIAN PHOTOGRAPHS.—Messrs. Colnaghi, Scott, and Co. are about to publish a splendid series of photographs, made in Egypt and Greece, by C. G. Fountaine, Esq. These are taken from admirably-selected points of view of the countries in question, and present the ancient remains and famous localities with impressive grandeur. The effect chosen for representation is generally a softer one than that preferred by Mr. Frith in his noble collection. The Rock Temple of Abou-Simbel; the Eastern Colonnade of Philæ; the Hypæthral Court and Hieroglyphic Wall at the last place—are rendered with the greatest force and delicacy. Not less delightful are those from Karnac, Edfou, and Luxor.—*Athenæum.*

MOON PHOTOGRAPHS, SILVERING GLASS, &C.—The following remarks, copied from the *American Journal of Photography*, are by Mr. Rutherford:—"My study and practice of the application of photography to astronomical purposes began in 1857. In that year I made my first stereo. view of the moon. In 1858 I succeeded in producing perhaps the most perfect view yet made. Since that time, although I have often attempted, I have not been able to do so well. The chief difficulties under which I labour are the disagreement of the chemical and visual foci of the telescope and the atmospheric fluctuations. Moreover, the moon has north and south motion as well as east and west, and the machinery attached to telescopes are devised only to make corrections for the latter motion. These motions would do but little harm if we had a much more rapid process. Two and a-half years ago I read an article in *Comptes Rendus*, by Foucault, in which he advocated a reflecting telescope of which the reflector is a silvered glass mirror. He claimed, with Steinheil, that all but three per cent. of light would be reflected by such a mirror. Mr. Fitz and I at once attempted such an instrument, and the work was soon completed, with the exception of the silvering of the mirror. The tube is thirteen inches in diameter and ten feet in length. The whole instrument, now complete, weighs thirteen pounds. The telescope is of the Cassagranian style. The silvering was done this winter, after a week of study and experiments. The solution was thirty-two ounces of water, in which seventy grains of ammonio-nitrate of silver were dissolved, and the necessary quantity of milk sugar added for the precipitation. About one-fifth of the silver was deposited on the mirror in half-an-hour, the rest precipitating on the sides of the containing vessel. Since the instrument was completed there have been but few suitable evenings for a trial, and those at an early hour. But, on account of the trembling of the earth in the city, I am afraid that any success is hopeless. These movements are greatly multiplied in the reflecting telescope. This is the only difficulty with the new instrument, for it gives good definition, and thirty-six times more illumination than my refractor."

Foreign Correspondence.

Philadelphia, March 23rd, 1862.

To quote from a New York letter:—"We are all in '*hot water*' here. Try Dr. Draper's process, and you will soon be *warm* in your praise of it." Much positive information has reached me, all tending to prove that it is the greatest discovery in the art that has been presented to us for several years. It is one of those remarkably simple discoveries which we cannot but wonder have not been developed sooner. As far as I have been able to learn, it has only been applied so far to tannin plates; but there can be very little doubt that it will be of equal advantage in the treatment of other dry plates. At the last meeting of the American Photographical Society, the only one who seemed to be doubtful as to the advantage of the hot water was Mr. Rutherford, who merely said it had not been so successful in his hands as with others; and he asked for further information regarding it. Mr. C. W. Hull comes boldly forward at once, and, in the last number of the *American Journal of Photography*, in an article from his pen, bears the strongest testimony in favour of it. Mr. Hull has, however, been remarkably successful with dry plates manipulated in the usual manner; and his charming proofs from dry plates would leave little room for improvement.

In a corner of the last sheet of my last letter I said a few words about skylights: since then I have made inquiries from various sources in regard to them. One operator, who has been connected with the art for years, says he does not like the high skylights. He prefers them of ground-glass in clear weather, but would like to have plain glass for cloudy weather. He objects to the very lofty lights on account of the shadows not being so decided. With a glass roof about ten feet high, and a side light extending to within five feet of the floor, he claims to be able to produce the most pleasing effects. I asked him about the blue glass with which several rooms have been glazed, and his only objection was—"I don't like any light that causes one lady to say to another, 'Oh! how horrid you look!'" Having made the pose of his sitters an especial study, he was able to give much information as to the proper management of the light. For vignettes he places his sitter far back, not under the glass roof, and places on her lap a piece of blue glazed muslin—the dull side uppermost—thus throwing a blue shade up under the chin.

Speaking of vignettes, Mr. F. F. Thompson sent a very interesting one from New York a day or two ago. The background had been white, and, after the head had been printed, it was covered, and the remainder of the card printed very black; thus showing on a black card a gradual fading into the clear white of the centre, where the head was clear and sharp on this white ground, just like an opening through a very dark cloud.

The great fault with card pictures is the great sameness of the attitudes. Each operator has his set series of positions, into one of which his subject must be forced. When fancy backgrounds were in vogue this sameness was intolerable; and the seated or standing figure before a plain, dark screen was a pleasing relief. It has often been a matter of astonishment to me that some enterprising photographer, who has earned some celebrity for artistic taste and good work, has not opened, in connexion with his regular gallery, a separate establishment, with a neat front door, no show cards displayed, but, by means of a simple silver plate, the world should be told that John Smith, photographer, was to be found within. Here, with comfortable parlours and dressing-rooms, every effort should be made to please visitors, who should have certain hours appointed for each, just as a dentist makes his appointments in advance. Many, very many, would gladly pay five times the cost of an ordinary picture to have the satisfaction of not waiting hours for their turn, as is now the case. In our crowded galleries may be seen every day plenty of distressed, anxious faces of visitors, wearied with waiting, and in no condition to put on their very best looks.

The card pictures have become so important a branch of the photographic art, that we find several of our leading papers publishing two-column articles on the subject. The *Philadelphia Press* had a very interesting article on the subject, showing the commercial value of these pictures; for, as an article of manufacture and trade, I dare say we shall soon see General M'Clellan, President Lincoln, and so forth, quoted in the price-current lists, as follows:—"Card pictures rather uppish: some slight advance on former rates. Note the sale of 2000 portraits of *Mrs. Lincoln in Ball Dress* to one *party* at two dollars per dozen. Considerable inquiry for proofs from the suppressed plates, but owners refuse to sell." I cannot but notice that the name "*cartes de visite*" is being rather dropped and the plain English card-picture used instead. Our language is quite capable of expressing all our wants, and there is little need of our befogging ourselves with the belief that card-pictures are not visiting cards but are *cartes de visite.*

Some day I want to tell your readers all about some large book-binding establishments which are now almost exclusively engaged on albums for these pictures, and a short sketch of the way they are made may not be uninteresting. In this country of ours we are very apt to do everything we can by machinery, and the machinery is often quite as interesting as the work produced. Some English writer in speaking of this tendency in America to do everything by machinery says:—"They can do so readily; for in America they use machinery to make the machines for making their machinery."—*i. e.* the work from beginning to end is done by machinery. To illustrate this—if I may be pardoned for digressing from photography—one firm having received an order for many thousand projectiles for rifled cannon to be delivered at the rate of one thousand each day, in the short space of two months had designed and executed machinery to produce the required number, so that now these shot are being made at the required rate, and are drilled and tapped for the fuse-plugs by four machines, attended to by three men; and

these thousand shot per diem have their lead cups cast on to them by machinery, with only two men to manage that part of the operation. This is occurring under my own eye, and illustrates the enterprise of our people in introducing mechanical contrivances. While on the subject of machinery, I must add that several new styles of rolling-machines for photographic purposes are in progress of construction—some of them adapted for amateurs, and so simple in their design as to be furnished at a low price. Some very excellent cast-iron printing-frames have been made—the frame being a very light casting, or rather two castings, with a sheet of woollen cloth between to make a soft bed to receive the negative, and the hinged backs are made by cementing flat sheets of tin to the woollen cloth with gum shellac, and afterwards soldering on stiffening pieces to which are attached the holding-down spring. The cloth itself forms the hinge. I could send a sketch of these and other useful little devices, but I fear the kind Editor would object to printing them. In photography applied to the arts one machine-maker writes to inform another that some device he is using is the property of the writer, and warning him against the continued use of it. Upon being applied to for further information relative to the invention, he encloses a stereograph of one of his machines, on which is clearly seen his patented device and the notice of the date of patent. No letter is required: the picture tells the whole story.

There has been a good deal of talk about the merits of "composed" pictures, and many of our connoisseurs banish from their collections the made-up semi-theatrical pictures of the shops. But the members of our Amateur Photographic Exchange Club were thrown into convulsions of laughter a few days since by the receipt of a stereograph from Professor Rood, the gentleman who has made such fine stereo-microscopic pictures, and who wrote about the *Pleurosigma angulatum*. The subject was the *Ghost Scene in Hamlet*. The scenery was card-board, inked in with marking ink; the stage an office desk; the foot-lights cut out of paper and stuck along the front; and the actors stuffed owls and blue jays, with paper spectacles and card-board swords. There is no good reason why those who like them should not be gratified by scenery, composed pictures, comic or instructive.

Photography is following the army south, and very many good operators are finding employment in portraiture in the camp, while at the same time occasionally very interesting camp scenes reach us. One of the camp photographers tells me that his dark box folds up so as to be readily carried on horseback, and he finds no trouble in managing his various solutions in the field. He has in his dark box two baths side by side—one containing the silver solution and the other salt water. After development with iron he immerses the plate in the salt bath, then coats with glycerine, and fixes and strengthens at his leisure. His iron solution is carried in small bottles securely stopped to exclude all air, and contains, besides the usual amount of acetic acid, one drop to the ounce of formic acid. He treats his bath in a very simple way to keep it in good order—boiling it down in a porcelain bottle (which he carries for the purpose) to about one-half its bulk, then adding water and some fresh crystals of silver; finally shaking up with it some freshly-prepared iodide of silver which has been well washed, but has not been exposed to the light—this iodide of silver in its flocculent state acting mechanically to carry down many impurities. He also stated that, in his experience at home, he found his bath immediately after filling, full of minute crystals of nitrite of silver, which seemed to cover each plate with minute pinholes. This condition of the bath he could always correct with iodide of silver and then filtering.

While on the subject of baths let me add that, as there is no doubt clean plates conduce to clear solutions, it is of the utmost importance to have a good method of cleaning glass. What seems to be most in favour in New York just now is a solution consisting of equal parts of commercial nitric acid and water, to which a quarter of an ounce of mercury per pint of acid is added, making an acid nitrate of mercury. This solution can be kept in an open vessel in the room, and the plates, whether varnished or not, can be thrown in and should remain there for some days until needed: they can finally be washed under a stream of running water, and stood up to drain. They may then be used without polishing. There is claimed for plates so cleaned an entire immunity from all metallic iridescence under the films in the clear shadows.

At the last meeting of the American Photographical Society Mr. Pike stated that he was working tannin plates which, after being well washed, had been immersed in a five-grain solution of silver; and that plates so prepared were quicker and more reliable than the ordinary tannin plates, but would not keep so well. As some have advocated coating the plate before applying the collodion with thin albumen, to cause the film to adhere, Mr. Hull asserted that he had been in the habit of running a narrow margin of albumen around his plate, and that the portion so covered with albumen was not nearly so sensitive as that on the clean glass. This is an important fact, and is an experiment worth trying.

I had intended devoting a portion of my letter to the various strengthening processes in vogue; and to have alluded to Professor Seely's experiments with palladium and iridium; but too much space has been already occupied, and I have only room to subscribe myself, with due regard, COLEMAN SELLERS.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

EQUIVALENT FOCUS.

To the EDITOR.

SIR,—In your Leader on "What a Lens Will Cover" you deduce from certain experiments, &c., the equivalent focal length of a No. 1 triple lens supplied by me as = 8·82, which, however, is considerably in excess of the true amount. Having recently been requested to determine the exact equivalent focal length of a No. 1 triple for one of our first metropolitan artists, who desired to use it for enlarging purposes, I took occasion to compute the focal length with all possible care and accuracy, and found it to be = 8·14. I may mention that the original calculations upon which the No. 1 triple is based assigned the value of 7·8, but owing to some slight variation frequently occuring in the optical properties of the glass, as obtained from Messrs. Chance, the focal length may vary by a fraction over or under 8. I unhesitatingly assert, however, that in no instance has a lens of the kind been supplied by me, the focus of which = 8·8. The constant and daily-increasing demands upon my time and attention do not permit me to point out the several sources of error in the deductions by which you arrive at the above results, but I doubt not that on verification of previous experiments you will discover a discrepancy somewhere, and that the final and correct result arrived at will very nearly, if not quite, coincide with my statement.

In the article referred to you also come to the conclusion that a certain picture shown to Mr. Hornby was a reproduction. This conjecture also I must beg to contradict. The picture in question is a *View of Wippingham Church*, taken by Mr. Ernest Edwards, a member of the Amateur Photographic Association.

I have already stated elsewhere that Mr. Wilson, and perhaps not a few others with him, are of opinion that the No. 1 triple covers more than a single view lens, in proof of which he has sent me two "views" taken from the same spot, with the No. 1 triple and with a view lens. The former includes about one-fifth more of subject, and the definition at the margin is of the two superior. So much for the facts of the case. Another important point in connexion with this last-mentioned subject should be borne in mind, viz.:—When taking a view with the single combination (no matter of what form) including an angle of about 40°, the angle of deviation or displacement of objects at the extreme margins of picture amounts to no less than 4°, and of course so much on each side of the axis. Those who advocate the use of single view lenses for even larger angles, would do well to remember this.

I am, yours, &c. J. H. DALLMEYER.

[We will certainly re-examine the experiments we made at as early an opportunity as we can make. Meanwhile we are proceeding with some others in reference to the question at issue: up to the present time, however, we have no reason to alter the opinion already expressed relative to the "angle of view" capable of being included respectively with the triplet and single lenses. Certainly the triplets are of the highest value for certain purposes, but we cannot admit that they are better than, nor even so good as, well constructed single combinations for *general landscape purposes*. It is not a question between Mr. Dallmeyer's lenses and Mr. Anybody's, but between triple combinations and single for certain other purposes; and we have no doubt that we should for the purpose specified have no fault to find with single combinations constructed by Mr. Dallmeyer, whose talent as a theoretical and practical optician we have already stated we hold in *very* high esteem.—ED.]

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—When I made the communication on which you commented in your last, I was aware that *all* opticians, in estimating the focal lengths of their lenses, measure from the surface of the lens nearer to the back of the camera, instead of from that point which would coincide with the optical centre of a single lens equivalent to the compound. I was not, however, prepared to learn that a difference of more than 1¾ inches could

exist between the so-called focal length and the equivalent or true one of the lens in question.

It appears to me that your method of determining this focal length introduces several elements of error, of which I will mention two :—

1st. As to the determination of the focal length of the spectacle lens. The longitudinal aberration of such lens is proportional to the *square of its diameter*; therefore, when not stopped down, the aberration will be very considerable. *Within the limits of this aberration* you cannot say what is the focal length, and therefore an error to the extent of the aberration may creep in; and as the aberration is great, so may the error be. That it is *impossible* to determine the focal length of an uncorrected lens, like that you used, is experimentally seen by taking up any cheap opera-glass or telescope. It may frequently be turned through more than an inch without either increasing or diminishing the distinctness (or rather indistinctness) of any object seen through it. That the lens you used was guilty of great aberration you admit; for you say afterwards that, in making use of it in the camera, "the *definition was so unsatisfactory* that you reduced the aperture to $\frac{1}{8}$ths of an inch," and that then "a *fairly* distinct image was formed."

2nd. The distortion produced by the spectacle lens would also be very great; and, therefore, in measuring the distance between the images of the window bars formed by it, another great error might be introduced, unless care were taken to measure the *widest* distance between them.

But could not the focal length of the triplet have been calculated directly by the first method you indicate (for the determination of that of the spectacle lens) on page 121. Or, what seems a simpler method still, has suggested itself to me; and as I do not know that it has appeared before, perhaps you will allow me to describe it fully.

Choose any long horizontal line, as nearly as possible the height of the camera—say the top of a wall: proceed as if to take a view of this, and, having obtained a distinct image of it, take the following measurements:—1. The length of the line (*i.e.*, the top of the wall). 2. The length of its image on the ground-glass. 3. The distance between the planes of the wall and ground-glass. Then divide 3 into two parts proportional to 1 and 2 respectively: the latter will be the focal length required. Thus if the length of the top of the wall is (a) inches, of its image on the ground-glass (b) inches, and of distance between wall and ground-glass (c) inches, we have to divide c into two parts proportional to a and b respectively. These are $\frac{a}{a+b}c$ and $\frac{b}{a+b}c$; and therefore the focal length required is— $\frac{b\,c}{a+b}$ inches. This method is exceedingly simple, the only measurement that requires extreme care being that of the image on the ground-glass. The planes of the wall and ground-glass should be practically parallel, and the camera-stand opposite to the middle of the line. Then, assuming that the distance of the wall from the camera is not small, so that a pencil from any part of it may be considered made up of parallel rays, by this method you easily obtain the focal length with slight chance of error—in fact, the only chance is incorrect measurement of the image on the ground-glass.

I have not tried my lens by this method, but intend to do so shortly; but a friend tells me that he has tested his by the first method (that given by you), and finds its focal length 7¼ inches. I must confess that even this is more than I had expected, and fancy that the focal length, as measured in the *usual* way, must therefore be more than seven inches.

That I made another slight mistake in my last I must also confess; but as, by some provide ntial dispensation, frequently happens, the errors are such as compensate each other. I stated that a picture eight inches square had been taken with the lens: the truth is it is ten by eight. The picture was not a reproduction, but a view of a church, and exceedingly sharp and distinct it is to the very edges. A print from the negative is in the Amateurs' collection at Mr. Melhuish's, 26, Haymarket. There, however, it is cut down into an elliptical shape—longer axis, exceeding nine inches. The negative was taken by E. Edwards, Esq. (whose pictures in that collection were generally commended). He tells me that he uses Mr. Dallmeyer's triplet continually for ten by eight plates, and always considers them well covered by it.

I have just seen two pictures taken by Mr. Wilson from precisely the same spot, for the purpose of comparing this lens with the single one with which he had previously been working. A far greater angle is included in that taken with the triplet, with, to say the least, an equal amount of distinctness.

That it is an advantage, and *a very great one*, to work with a lens of large angular field, I was painfully convinced this summer, whilst in Rouen and other continental towns, where I was exceedingly "cabin'd, cribb'd, and confin'd," most of my pictures being spoiled through my not being able to get in just *a little more*. It is in architectural subjects, far more than in landscapes, that I have always felt that deficiency, which *I am sure* is partially remedied by Mr. Dallmeyer's triplet.

I am, yours, &c., D. HORNBY.

[1. This objection might be sound, were no precautions taken to ascertain approximately the amount of longitudinal spherical abberration. But, supposing an error to have been made, as the focus of the centre of an uncorrected lens is longer than that of the margin, this error must of necessity have been in favour of the triplet, as the focal length of the spectacle lens was determined with the larger aperture; but in focussing the window frames the diaphragm was used: it is therefore scarcely possible that the actual focus of the spectacle lens could have been shorter than we observed it to be, while it is possible for it to have been somewhat longer; and as the distance between the window frames depicted on the ground glass was *greater* with the triple than with the single lens, it follows that, if we committed an error of the kind supposed by our correspondent, the triplet must have had an equivalent focus *still greater* than that we calculated to have been the case.

2. We omitted to mention that the diaphragm we used we placed *in contact* with the single lens, and therefore there was no distortion by displacement. We have no objection to the method preposed by our correspondent for ascertaining the equivalent focus, provided the "wall" be at a sufficient distance; but then we fancy the trouble will at least not be less than by either of the other methods suggested. The phrase "the focal length measured in the usual way," we would amend by interpolating the word "erroneous" after "usual." We will endeavour to obtain a proof of the church mentioned from the entire plate, without being trimmed at all. This is a question we mean to push to "an absolute focus" before we have done with it. We do not question the superiority of the triplet for architectural purposes.—Ed.]

MODIFICATION OF THE FOTHERGILL PROCESS.

To the Editor.

Sir,—Your answer to A. Gosling's query in the last number of The British Journal of Photography, respecting a modification of the Fothergill dry process, is not strictly correct. The method was specifically given, with the why and wherefore, in the report of the South London Society on the dry processes, and not orally suggested at a meeting.

I mentioned that it was the practice in manipulating these plates to leave a portion of free silver thereon after washing, and that on pouring on the albumen solution, which, as commonly used, contains a large excess of ammonia, the silver would form a *soluble* compound with the preservative, and not an insoluble precipitate, as was generally stated. Thus if a portion of albumen solution be placed in a measure, and a few drops of silver be added, the white precipitate of albuminate of silver at first formed would quickly be dissolved by the ammonia. I therefore argued that, instead of *partial* washing, and the subsequent combination of the free silver with the preservative taking place *on the plate*, it would evidently be neater to *thoroughly* wash, and flood the plate with albumen solution containing a definite quantity of silver.

The exact formula, given as nearly as I can recollect, was this:—Thoroughly wash after sensitising, and thoroughly drain: pour the preservative on and off five or six times, and again thoroughly wash: drain, and dry. The preservative was made thus:—Albumen, one ounce; water, five to ten ounces; thirty-grains solution of silver, one drachm—part of the bath may be used for the purpose—and sufficient ammonia added, drop by drop, to dissolve the albuminate of silver. Beat, or well shake, and the solution will get limpid in the course of a few hours. The preservative thus made may be used over and over again, so that the quantity given will coat a great number of plates.

I cannot see that Mr. Barber's suggestion of forming ammonia-nitrate of silver before adding the albumen instead of after, makes any difference in the resulting mixture. It is certainly neater, but the end is the same.

I should mention that the addition of silver to the albumen preservative had been suggested by Mr. Bartholomew, in a letter to the *News*, some time before I remarked on the subject; but I need scarcely say it entirely escaped my recollection, even after it came under my notice at the time. This was probably owing to the fact that the reasons for the formula were not given, and, therefore, it is possible I may have passed it over with a single glance, thinking it only another of the *novelties* we see so frequently in the pages of our photographic journals.—I am, yours, &c.,

MICHAEL HANNAFORD.

QUERIES FROM THE OPERATING-ROOM.

To the Editor.

Sir,—I shall feel obliged if you will answer the following in your next Journal:—

1. If I mix *equal quantities* of iodised collodion over six months' old and the other freshly-iodised, will it be of the same sensitiveness as if the collodion were three months' old?

2. I wish to dissolve some nitrate of silver in *plain* collodion. How can it be done?

3. Which method do you think best for decolourising the nitrate *printing* bath—kaolin or citric acid? If the latter—how? I now have some kaolin in my bath; but I find it rather troublesome in the filtering.

4. Wishing to test the permanency of my prints, I put portions of my worst pictures in a bottle with a little water at the bottom, and corked it up tightly (according to Mr. Hardwich's *Manual*), and kept them three months. They are all nearly covered with yellow patches (as you will see by the two enclosed pieces). The other portions which I kept in a portfolio are all quite unaltered. Please to inform me of the cause. I use a seventy-grain silver bath, and the carbonate of soda and gold toning, and sometimes the acetate of soda and gold, which keeps—as per Mr. Hughes's book. I wash the chloride off before toning, and also wash a little after the toning, and I use the hypo. one ounce to four of water, and immerse for fifteen minutes; but I do not mix it fresh every

time. I thought of mixing a quantity, and using a portion of it every time I print a batch, and then throwing it away.

5. Do you think that the best way, and can I keep a *fresh* solution of hypo. for any length of time?

I generally wash in a syphon trough for about six hours.—With thanks for past favours, I am, yours, &c., AMATEUR.

April 8th, 1862.

[1. We are not in a condition to give any authoritative reply to this question in general terms; but we apprehend much would depend upon the constituents of the collodion as to the condition of it after the lapse of three and six months respectively. Some kinds may alter much at first and but little subsequently; others may keep well up to a certain point, but go off rapidly when once decomposition of any kind has "set in." Again, the time of year would no doubt influence the result.

2. Dissolve the crystals in alcohol, and add as much as you desire to the collodion.

3. That with citric acid. First make the bath decidedly alkaline by the addition of liq. ammoniæ; then add solution of citric acid, until the precipitate carried down has decolourised the bath; then decant and filter.

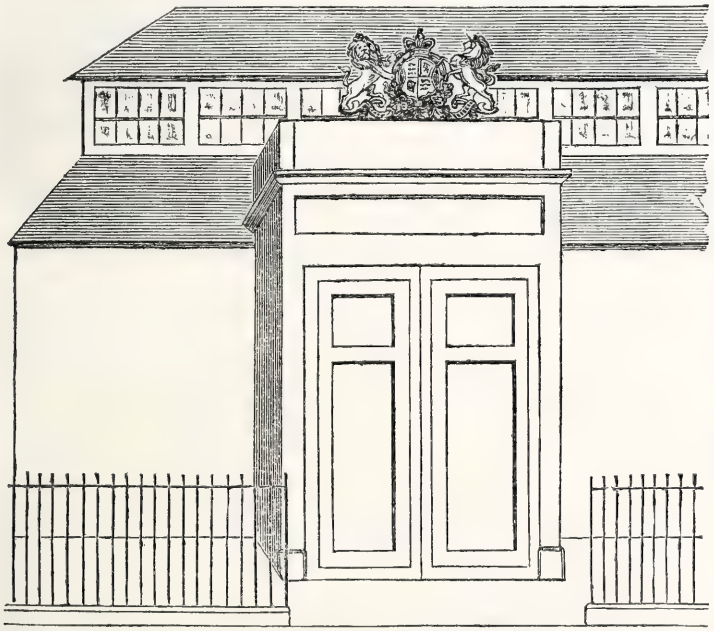
4. We have no doubt that the yellow stains are due to imperfect washing, which the *experimentum crucis* that you have applied has discovered. This is another instance in favour of our frequent condemnation of the lazy method of washing. You may depend upon it the economy is bad.

5. We know no reason why you should be unable to keep an unused solution of hyposulphite of soda for an indefinite time. You will find a practice which we adopt for the fixing bath very convenient. It is as follows, viz.:—Into a bottle full of the crystals of hyposulphite of soda pour as much water as it will hold, let it stand and shake it up alternately until the solution becomes saturated. When about to use it, mix one measure of this saturated solution with two measures of water.—Ed.]

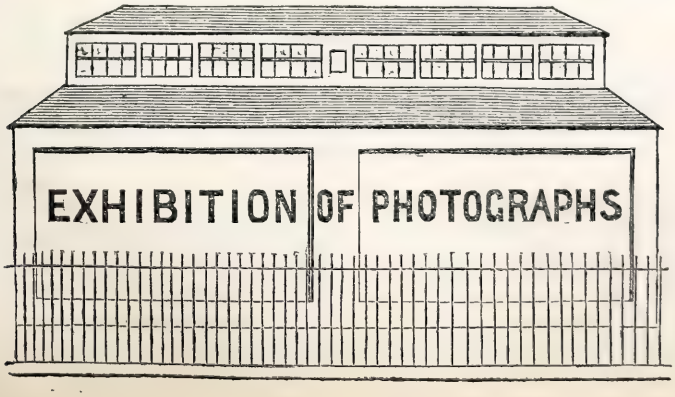
SUGGESTION FOR A SUPPLEMENTARY EXHIBITION OF PHOTOGRAPHS.

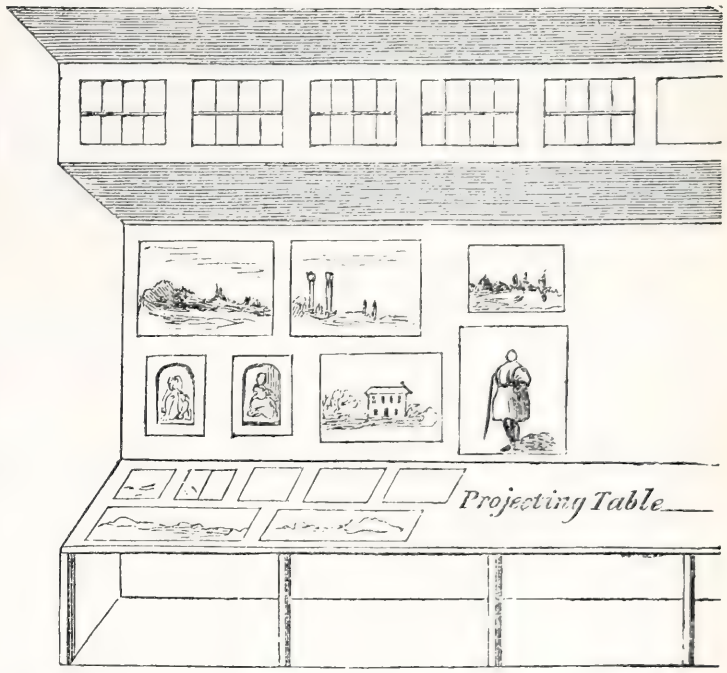
To the Editor.

Sir,—I send up by this same post some sketches illustrative of my idea of what might have been done, or may be done now, for an Exhibition of Photography. Height is not wanted, but length, breadth, and a good light. Take (say) the ground in Leicester Square, and run up a wooden



building after the manner of the sketch, with boards overlapping, and in their full lengths, so that nothing need be cut or wasted, while the outside rails would be a protection to keep off idlers and boys. The windows for light may be composed of sash-frames the usual size for houses, so that they could be used for that purpose when done with.





The inside to show photographs to the height of ten feet, with a projecting table all round, breast high, and on the slope. This carried out on an extensive scale, open during the day, and by gaslight at night, would, I have little doubt, be a good paying concern. In the out-of-the-way places that I am working about, I only occasionally hear of what is going on, or I should have tried to have hit on something of this sort before. There used to be a place in Old Bond Street, the Western Exchange, with a good light.

This is the time Herr Paul Pretsch's photogalvanographic move ought to have been in operation, and, by taking copies of the various articles in the Exhibition for catalogues and illustrated papers, it would have had a good chance of success. I am, yours, &c., J. F.

March 28th, 1862.

MULTIFARIOUS TROUBLES.

To the Editor.

Sir,—If you would kindly answer me the following queries, in the next number of The British Journal of Photography, you would greatly oblige me:—

1. Sometimes in intensifying a negative with pyrogallic and silver, after developing with iron and fixing with cyanide, there forms a *reddish-brown* film over some parts of the plate which effectually prevents it from printing. At other times a *bluish* film covers the transparent parts of the negative, such as the shadows under the chin and under the arms, &c., which takes away all the detail, and when printed gives quite a *fuzzy* appearance. I noticed this very strongly on two or three men with large beards and whiskers, which were rendered as if they had a roll of flannel round their faces. What is the cause? The enclosed print of the chancel of a church shows the fault of the red film before intensifying. The picture was beautifully detailed in all the shadows.

2. When washing my albumenised prints, after removal from the hypo. bath, I have noticed small blisters all over the albumen.

3. In the *Development Printing*, given in your impression of February 1st, M. Oppenheim says:—"To this iodised serum of milk add an equal quantity of *similarly prepared* albumen," &c. What does he mean by "*similarly prepared?*" Is it to be treated with tartaric acid, boiled, and filtered? or is it to have iodide of potassium added? Or, if neither of these, what is the way to prepare it; for the word "*similarly*" may be applied either to the "tartaric acid," or the "boiling and filtering," or the "iodising," or the "clarifying" by means of albumen. I began to try the process, but was cut short here. Again, when the nitrate of silver and acetic acid were mixed in the gallic acid solution, it turned the colour of wine and water. Is this right?

4. Please to give me your opinion of the enclosed negative of *Wargrave Rectory*. It was taken with an ordinary market half-plate lens, single combination, half-inch stop, developed with iron, and intensified with pyrogallic and citric acid, toned with chloride of gold and carbonate of soda. [The sky was blocked out in consequence of a stain.]

I am only an amateur, young in practice, and shall therefore be glad of your opinion on these matters. S. S. L.

[1. The brown stains and foggy blue film no doubt both arise from imperfection of manipulation; the former probably from a trace of the iodide of silver not being quite removed from the film, while the latter may

have something to do with the iron solution. A more thorough washing between each operation is what we should advise, and the use of hyposulphite of soda as a fixing agent, in preference to cyanide of potassium.

2. We believe blisters in albumenised paper to arise from defective paper: most likely there is something wrong with the sizing.

3. "Similarly prepared albumen" evidently means "iodised albumen" not treated with tartaric acid, &c. The gallic acid should *not* have become discoloured. The fault is, most probably, in the acetic acid, which, if added in the quantity directed, was of insufficient strength: add more acetic acid next time. You should use *distilled* water for the gallic acid solution.

4. Your lens is undoubtedly good: we doubt whether you would be able to improve upon it. Your picture is also good, the point of view well chosen, and the manipulation clean. You may become a first-rate photographer if you go on as you have begun.—ED.]

PRINTING BY DEVELOPMENT.

To the EDITOR.

SIR,—I have been endeavouring to carry out the formula for *Printing by Development* (as given in a late number of the Journal), by M. Oppenheim, of Dresden, and have met with results somewhat different to those I expected. I therefore give you a statement of my *modus operandi* and the difficulties I have met with, and shall be very glad to be set right if I have made any fundamental mistake in my process, or to receive any suggestions you can give me that may aid me in carrying out this process, if in your opinion it is capable of realising the advantages attributed to it.

My mode of proceeding is thus:—I first made a ten-grain solution of tartaric acid, and, having heated skimmed milk till it steamed freely, I commenced dropping into it the tartaric acid, stirring meanwhile. As coagulation proceeded I tasted the mixture frequently, and found it neutral to the taste. I continued dropping the acid in till coagulation ceased and a slightly acid taste was perceptible. I then roughly filtered the curds away and set it to cool. When cool I filtered it, and added twenty-four grains to the ounce of iodide of potassium, which it dissolved very freely.

I next took some albumen, and, having mixed it to homogeneity, I commenced dropping in the tartaric acid, and continued it (as I had done with the milk) till coagulation ceased and a little acid was perceptible to the taste, when I filtered it through paper, and added an equal quantity of the iodised serum to it. The mixture was a full lemon colour. I then took Canson's plain negative paper and floated on the iodising solution thirty seconds, and pinned up to dry.

The next morning I found that the inner surface of the glass vessel into which I had put the iodising solution was covered below the surface of the fluid with small sparkling crystals, which I filtered out, but have not tested, beyond proving that they have no acid reaction. The iodising solution, in twenty-four hours later, was quite full of mouldiness, and good for nothing. On looking at the paper I found that free iodine was liberated on the surface, and a light-brown colour produced, which was driven off by heating the back of the sheet at the fire; but, as often as I do this, on cooling the brown colour reappears, so that both the iodiser and the paper are imperfect. I have thought of neutralising both the serum and the albumen with ammonia before mixing them. Is it probable that I should gain anything by doing so? The expression in the formula given—"similarly prepared albumen"—led me to treat it with the acid. Did I do right? Ought the iodising fluid to have keeping qualities? Can it be used more than once or twice? I shall be obliged by any information you can give me, or for any other process for iodising paper (for enlargements) that is both certain and tolerably quick.

I am, yours, &c., THOMAS ROBINSON.

[You have omitted referring to the volume and page where the process about which you inquire may be found, an omission which entails much loss of time and also needless trouble on us. It was an error to have added the tartaric acid to the albumen, and on mixing the latter with the iodised serum, decomposition of course ensued. The crystals you found were, most probably, tartrate of potash and free iodine liberated. Since the preceding was "in type" we have received another letter, referring to this subject, from "S. S. L.," which see.—ED.]

TRANSPARENCIES FOR THE LANTERN.

To the EDITOR.

SIR,—Having had some experience in the production of transparencies for the magic lantern, I beg to submit to your readers the method of producing clean, sharp pictures. I give the preference to thin, flatted crown glass—it must be free from scratches and air bubbles, and well cleaned and dried immediately before use. Good negative collodion, bromo-iodised, and with one grain of resin added to each ounce. The nitrate bath:—forty grains nitrate of silver, distilled water one ounce, saturated with iodide of silver, glacial acetic acid ten minims. Let the collodionised plate remain in the bath three to four minutes, then wash it well with clean water: drain and dry by artificial heat. The exposure under a negative varies from one to ten seconds in the shade. To develop, immerse the plate in water for one minute, drain, and pour on enough to well cover the film of a ten-grain solution of nitrate of silver; let it remain on half-a-minute; pour off the superfluous silver solution, but not to drain the plate. If intending to exhibit the picture with the oxy-hydrogen light, develop with pyrogallic acid two grains, citric acid one and a-half grains, water one ounce, alcohol ten drops. If paraffin or Argand lamp-light be used, I prefer developing with protosulphate of iron twelve grains, acetic acid twelve minims, water one ounce, alcohol five drops. Fix with cyanide of potassium. In either case varnish with mastic spirit varnish. If to be coloured, paint on the plain side of the glass.—I am, yours, &c.,

April 8th, 1862. H. R. NICHOLS.

ANSWERS TO CORRESPONDENTS.

PARIS CORRESPONDENCE.—Up to the hour of going to press M. Lacan's letter had not arrived. This is the first of our esteemed Correspondent's interesting letters which has failed to make its appearance at the proper time.

A. J.—Received: thank you!

COLEMAN SELLERS.—Received: reply shortly.

C. RAYDON.—We shall probably continue it in our next.

J. E.—Correspondents should write on one side of the paper only.

TYRO.—We always prefer to employ collodion containing a bromide as well as an iodide.

ALBUMEN.—We have no doubt that simple white of egg is intended in the formula given.

M. M.—The award was announced in our last issue, which was at press when your inquiry arrived.

AN OLD CALCUTTA SUBSCRIBER.—Received: your letter, with replies, will appear in our next publication.

FRAS. VINCENT.—See numbers for August 15th, September 15th, October 1st and 15th—all of the year 1859.

SICCUS.—If you obtain all you desire with your present process we advise you not to change. Let well alone.

O. O. O.—For large plates plain paper is, in our opinion, far better for prints than the albumenised paper: for small ones the latter is a disagreeable necessity.

G. P.—The number of good negatives is very considerable; but it is somewhat singular that the ten-by-eight size presents an overwhelming majority of them.

RAMOTH.—Your exposure has evidently been too long, and the light thrown too full upon the sitter. Arrange matters so that the light may fall more obliquely..

R. D.—The addition of iodide of silver to your iodising solution is really superfluous. We remember when it was considered a great advantage; but experience teaches us otherwise.

Y. M.—You must mount the object, as if for microscopic examination, in Canada balsam before you can use it in the way you propose; but, even then, we fear it will not be sufficiently transparent.

QUERIST AGAIN.—You had better decline the lens about which you inquire, and wait until you can afford to buy an unquestionable one: you will find that the most economical course in the long run.

NORTH LONDONER.—You will have perceived by our last report that the presentation print is ready for delivery, and may be obtained from the Treasurer on application, by those who have paid their subscriptions.

F. L. D.—1. Put more pyroxyline into your collodion. 2. Use pyrogallic and acetic acids for your developer, and do not hurry the development. 3. Print slowly in a weak light; and never mind the toning, which is unnecessary for your object.

TRUANT.—You will, no doubt, have found many improvements during the two years of your absence; and it is no wonder that you are a little "at sea." Your best plan of getting up in all that has transpired is simply to look through the file of the journals.

SPECTATOR.—Those who fancy they know everybody are sometimes mistaken; and the worthy Secretary was in this predicament when he intimated that the Earl was not known as a photographer. We can prove to you that if he were not known he deserved to be so, which is more than can be said of some who are known.

SALVATOR.—A Nicol prism is better than a tourmaline, both for polariser and analyser, if you are particular about the purity of the tints; because the tourmaline, being itself coloured, somewhat modifies the tint shown. The field of view is, however, larger with the tourmaline. Many of the animal membranes, in particular the dermal appendages, are highly active on polarised light.

AMATEUR.—The *best* and *most portable* tent is certainly *not the cheapest* in regard to cost. If you consult our last two volumes you will find descriptions and illustrations of nearly every kind that has been introduced. If you adopt a dry process of any kind you do not require any tent; but if the wet one, perhaps Rouch's box will best suit your requirements. But we advise you to examine the different forms for yourself. You must have read very little if you require information relative to "the comparative merits of the wet and dry processes, and the cost, mode of use, and equipment in either case." These points have been *repeatedly* discussed in our columns; and to answer all, would require that we should write a manual. There are several good ones in the market, and we recommend you to procure one at once.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 165, Vol. IX.—MAY 1, 1862.

The International Exhibition.—About the time these lines will be before our readers' eyes, the first steps will have been taken towards the commencement of the ceremonial for inaugurating the opening of the International Exhibition; and, as the majority of our readers will clearly not be present, they will no doubt be gratified to learn that, through the aid of their favourite pursuit, they will stand a fair chance of being hereafter eye-witnesses of the scene by what we may designate a scientific second-sight.

Many have doubtless already learned, from the pages of the daily newspaper press, that the exclusive right of taking photographs of and in the building during the continuance of the Exhibition has been purchased for a large sum by the London Stereoscopic Company. It would not be discreet to name the exact amount paid for the privileges conceded, but we may mention that the sum of fifteen hundred guineas was paid down on signing the contract: the total amount the Commissioners will ultimately receive under the arrangement entered into will certainly be upwards of three thousand pounds. For this handsome sum several of the absurd restrictions proposed to be insisted on, and to which we drew attention in a former article, have been rescinded, and every reasonable concession has been made by the Royal Commissioners, to the intent that the work may be thoroughly and usefully performed.

Most extensive preparations have been made for photographing the opening ceremonial, and the chief posts for the execution of this important duty will be occupied by very able and responsible officers of the Stereoscopic Company.

An erection fifteen feet high is, while we are writing, in course of construction immediately in front of the Portuguese department, for the purpose of commanding a view of the throne when all the exalted personages who will take the initiative part in the impressive ceremony of the inauguration will be grouped together, and the task of obtaining a permanent record of the event will be entrusted to Mr. W. England, whose admirable instantaneous views, which we have recently described, are sufficient guarantee for his peculiar fitness for this very responsible post of honour. Of course he will be attended by an appropriate staff of assistants.

On either side of the western dome, where the address is to be read, will be stationed Mr. W. Russell Sedgfield and another photographic artist. The selection of Mr. Sedgfield to take a prominent part in the task of securing a photographic representation of this imposing spectacle is a happy and appropriate one.

Another "base of operations" somewhat further removed in the nave will be situated so as to embrace the orchestra, and give a *coup d'œil* of the whole. This very important post will also be occupied by a highly accomplished and artistic photographer, Mr. Stephen Thompson, with whose photographic works some of our readers are familiar, and we may presume that all are so with his literary productions, seeing that his contributions appear in our columns. Mr. Thompson will likewise be accompanied by his subordinates. From two other "posts of observation," one to the extreme right and the other to the extreme left of the orchestra, a sort of cross fire will be maintained in the reverse direction to those already indicated, bearing upon the spectators of the scene, amongst whom we may safely calculate upon a majority of ladies being included. It will be the task of the operators occupying these positions—we ought rather to have said the privilege—to secure a record of such a collection of beauties as perhaps never before for abundance can have been equalled: there is probably no other country in the world than our own where ladies form so large a proportion of the attendants at any public ceremony, and certainly none in which the sweet English faces can be surpassed. Acting as a foil and in curious contrast to these will be the Japanese Ambassadors, with their tawny complexions and splendid costumes.

The first proofs from the various plates secured are to be immediately forwarded by express to Her Majesty at Balmoral. Orders have already been received by the contractors from one firm alone for no less than fifty thousand prints; and we understand that any attempt at piracy will be stringently prosecuted.

The time of year is much in favour of photographic success, the actinism being perhaps at its maximum during the month of May. We sincerely trust that the weather will be propitious for the occasion.

Having glanced at the active phase of photography in connexion with the Exhibition, let us now advert to its passive existence there, which is far from presenting anything like so satisfactory an aspect. Our readers are already aware that the promised separate apartment has been reduced by one-half, but probably few of them know that, in order to gain access thereto, they will have to execute a feat about as fatiguing as going up the Monument; and that, having accomplished the "perilous ascent," with its accompanying evolution of vital heat, they will find due care has been given to secure them from taking cold, the temperature of the room in which the photographic collection will be displayed being, even in the middle of April, a trifle under that of the calidarium in a Turkish bath. We may therefore safely conclude that only a small per-centage of the visitors to the Exhibition will see the specimens of English photography at all; while those of our foreign exhibitors, being displayed in their respective departments, will be sure of being seen, if not examined, by everyone. Truly this is a worthy ending to the mismanagement of the whole affair from the commencement.

Before concluding, we may mention that the jurors selected by the Royal Commissioners to adjudicate upon the merits of the photographs exhibited are Lord Henry Lennox, Professor Tyndall, Dr. Diamond, M. Claudet, and Mr. Thurston Thompson.

Photographic Soiree.—On Friday, the 25th ult., the annual *soirée* of the Photographic Society was held in the large hall at King's College, London, at which a very numerous gathering of members and visitors, including a considerable proportion of

ladies, assisted. Prominent amongst the specimens displayed for the entertainment of the company was a very large collection of, or rather selection from, the works belonging to the Amateur Photographic Association. In addition to the immense album containing about eighteen hundred pictures, and a smaller one with about two hundred, there was a large portfolio of separately mounted specimens and several heaps of stereoscopic slides; and, to crown the whole, the slopes down both sides of the long hall were more than half filled with separate mounted specimens of the Association prints. There were of course many other contributors, but each to a very much more moderate extent than that we have just noticed.

M. Claudet exhibited a goodly array of his elegant portraits, both coloured and plain; a few photographically enlarged, which were very effective; and two or three life-sized pictures, that can only by a very extreme stretch of courtesy be considered as connected with photography at all. These, if we are rightly informed, were produced by projecting the enlarged image from a small photographic negative upon a paper screen, *sketching in the outline by hand*, and then filling in the details, &c., with colour—also by hand.

Mr. Mayall contributed a number of whole-plate and extra-plate portraits of celebrities, executed in his usual happy manner; and these were additionally interesting from having the names conspicuously appended to each one.

Mr. Williams contributed only a few specimens, but those few were artistic gems. They included a finely-vignetted head of the Earl of Tankerville, and an elaborately-coloured portrait of Mrs. Windham.

Mr. Thurston Thompson's reproductions from Turner's pictures attracted much attention; but we must candidly admit this was in a great measure owing to the fact that a very numerous proportion of the spectators could not at all make out what they were intended to represent, and mystery notoriously has its attractions. That the task of reproducing such works as those of Turner in monochrome is a most difficult one nobody would be likely to deny; that Mr. Thompson has executed his part of the work as perfectly as the photographic art would permit him to do, most people who understand the subject will readily concede; but that Turner's pictures, photographically rendered, are, to the general public, of much interest, we could not now admit, had we previously entertained any doubt upon the subject. As studies for artists they may be invaluable; but as pictures for the public they are almost valueless.

Mr. Stephen Thompson displayed some of his cabinet pictures in a convenient and novel manner—two being slid into light leather frames, hinged together like the sides of a portfolio, so that when closed the pictures faced one another. This allows of their being conveniently examined in the hand without risk of injury.

Messrs. Caldesi and Montecchi's collection of illustrations of antiquities, chiefly from the marbles in the British Museum, taken on plates of large size, were much admired.

Mr. Hockin exhibited a proof from an untouched heliographic copperplate, being the representation of one of Albert Durer's works.

Mr. H. P. Robinson's *Lady of Shalott*, and one or two other of his compositions, attracted much attention.

Unfortunately many of the works had no names or descriptions appended, and consequently we are unable to indicate many that we should otherwise have noticed. We recognised, however, the works of Mr. Rejlander and Mr. Mudd amongst them.

Messrs. Murray and Heath, Negretti and Zambra, and many others, exhibited stereoscopes, with beautiful transparent slides; Mr. Ross a complete set of panoramic camera and apparatus; Messrs. Horne and Thornthwaite a very large collection of apparatus and photographic chemicals, in addition to a table filled with microscopes.

There was plenty of animated and interesting conversation. Amongst other scraps of information we gathered was one that Mr. Bedford's tour in Egypt and Syria, in attendance upon the Prince of Wales, is as satisfactory in a photographic point of view as otherwise. He has already secured eighty interesting negatives, of which upwards of fifty are views on the banks of the Nile. Mr. England showed us some very promising portraits of stereoscopic size taken upon *dry plates*, with exposures of ten and twelve seconds. The details were fully out, and the half-tones everything that could be desired. Mr. England is still continuing his experiments with a view to competing for the prize offered by the Marseilles Photographic Society for the best instantaneous process. And, now, time and space warn us to conclude our remarks.

Photographic Copyright.—An idea has occurred to us that may be of some use in case any accident should defeat the measure of justice now under the consideration of the legislature, by which photographic copyright is proposed to be secured in common with that of other works of art. It appears to us that advantage may be taken of a law already in existence, by which spurious copies of any photographic work may be branded unmistakably with the merited stigma of piracy; and though this may not altogether put a stop to the nefarious practice now unhappily so common, it will, in all probability, exercise a very wholesome restraint. The law to which we allude is that which renders it illegal to employ a *facsimile* or even a colourable imitation of a *trade mark*. Of course, if photographs are not works of art, they are manufactured goods, and as such would be privileged to protection by the addition of a distinguishing trade mark. Now an appropriate trade mark might be readily affixed to every copy issued, in the form of an impressed stamp of the initials or monogram of the artist, previously to the photograph being mounted; and, as it is illegal to copy a trade mark, few would be inclined to attempt to do so, while the issue of an unmarked copy would at once betray its spurious character.

ON PHOTO-MICROGRAPHY.*

By J. Bockett.

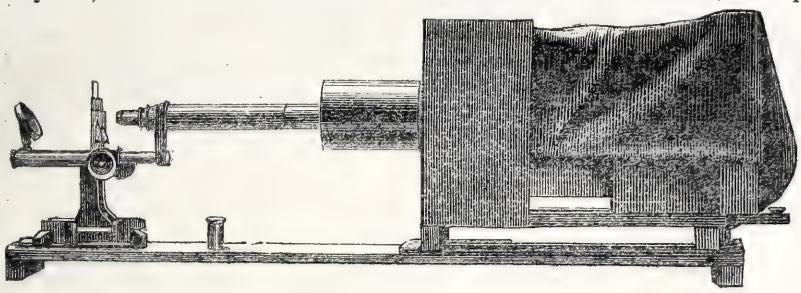
The term "photo-micrography" is used in contradistinction to micro-photography—the latter process being that by which larger images are greatly reduced, to be again magnified in the microscope: in the former, the minute objects themselves are enlarged by means of the microscope's objectives, and the enlarged image thrown upon a sensitive collodion plate.

The uses to which this application of microscopical and photographical science can be made available appear to be various. In botany, woody fibre, ducts, cells, starch, are all capable of being depicted. In physiology, muscular fibre, its markings; blood, its discs, nerve papillæ, &c., are all to be delineated. I would here particularly direct your attention to the structure of insects, photographs of which under this process appear to give some of the most pleasing and useful results. Another use to which this science can be applied is the furnishing the groundwork to the draughtsman who, by dividing the enlarged photograph into squares, can, by careful drawing, produce larger drawings thereof, which must be free from any extraneous finish which, perhaps, is sometimes used where drawings are taken direct through the instrument by means of the camera lucida, or neutral tint glass. Might not copies of photographs so taken be passed round a class during a lecture with more facility than having a series of microscopes with several (all must be more or less different in their preparation) of the same objects upon their several stages? Again, would not such objects, if conveniently mounted, find a place in the several *carte de visite* albums with which nearly everybody is now provided? At all events, the matter seems to have engaged at different times the attention of several eminent scientific men, and the only wonder is that, seeing such talent expended upon the subject, photographs of enlarged microscopical objects are not more often seen than at present is the case. Lately, in nearly every scientific paper, some inquiry or reference is made to attempts or results obtained; and as there may be many among you here who are possessed of instruments which they would like to use for the

* Read at a meeting of the North London Photographic Association, April 16th, 1862.

purpose, were they certain that they could do so without injury, I beg to submit the humble contrivance before you, which completely answers the purpose, and leaves the microscope intact when the operation is over.

I have great diffidence in meeting a society of gentlemen distinguished for their position in photographic studies, such as the North London Photographic Society is, and trust that you will kindly look upon me as an individual wishful to obtain, as well as to accord, any information. With your permission I will describe the contrivance before you, and point out the why and the wherefore of several of its parts which have, during the last three or four years, been added to or altered.



The instrument consists of—1st, a deal plank or base-board, about four feet long, upon which at one end is firmly and evenly screwed an ordinary half-plate camera. The body of this camera as it was originally constructed did not cause the disc which was thrown upon the screen to appear large enough, and the difficulty was obliged to be met by having an inner body made which fitted the fore and after part of the old camera. At the back of the base-board a piece of wood is screwed in which there is a slot, through which the screw for securing the position of the camera when drawn out is inserted. When this is tightened, all chance of the focus (when once found) being lost is avoided. To the front of the camera is affixed, by means of an ordinary adapter, a piece of brass-tubing three inches in diameter, having one end filled in with a disc of brass, in the centre of which is fitted a brass collar carrying a piece of tube sprung similar to a telescope joint. We now come to the focussing-screen, a proper material for which is extremely necessary. The original ground-glass was far too course, putty gave a very uneven surface, sensitised collodion was too transparent, flatted glass too rough, and white opal flashed glass too thick. So, at last, I ground myself a piece of glass with emery sifted through two thicknesses of linen, and combined the siftings with a portion of putty powder: this gave me a very fair ground surface, and answers the purpose better than anything that I have tried hitherto. In the sprung collar already alluded to is adapted a tube which fits the inside of the body of the microscope and is thrust through the collar. To the end so inserted into the camera another piece of tube can be fitted which will, if necessary, carry the eye-piece belonging to the instrument employed. I would here remark that I have never been successful whilst employing this eye-piece arrangement: of course the image is very much amplified, but the loss of light is very great. At the other end of the base-board three holes are cut to hold the feet of the microscope, the body of which has already been brought into exact juxta-position with the orifice in the large tube attached to the camera. The feet are firmly secured by three large wooden buttons. The objective best to use for all ordinary purposes, and which should undoubtedly be employed, if the object be to produce pictures for either of the purposes before pointed out, I find to be the one-inch, and the manipulation therewith is not very difficult; but, as the chemical and visual rays do not coincide, care must be taken to find how much farther away from the object the glass is to be turned after a sharp picture is shown on the focussing-screen. In practice I found it advisable always to take two pictures—one focussed sharp for the top of the object, and the other focussed sharp for the bottom thereof. Between these two extremes satisfaction is generally obtained. The magnifying glass I use for focussing consists of a double convex glass, an inch and a-half *in* focus, fitted to a brass tube, and so adjusted as to be in exact focus with the rough side of the screen. In the arrangement before you the field that this instrument gives upon the focussing-screen is small; but I have preferred to have the whole of the adjustments, both quick and slow, within reach, having intended to take the pictures for inserting in albums, and having the idea that further enlargement from the small negatives could be obtained by means of an enlarging camera.

Although I have at present but very few specimens to lay before you, my time being very limited—and in fact, the matter having again taken hold of me from the extreme success that appears to have welcomed Professor Rood, of America, and Mr. Parry, of Manchester—I still hope to achieve during the forthcoming summer better and more difficult subjects than those which I have done.

As you will see by the subjects before you I have selected those of a peculiarly difficult colour to photograph, viz., a dark brown; such being, I think, the average colour of the chitine of insects and many wood sections. As regards the exposure requisite for an impression, I shall touch upon that when we treat of the manipulation.

In the apparatus just described, nothing is added to it either for illumination or for centrilisation of the image after it is magnified; and, I am afraid, seeing the many improvements that appear to be made, and likely to be made, in that direction, that I may be guilty of only going over very old ground. I allude more particularly to Professor Rood's apparatus, described in No. 153 of THE BRITISH JOURNAL OF PHOTOGRAPHY; to Mr. Parry's (of Manchester) mention of a a-plate lens for the reception of the image, in No. 160 of the same periodical; and also to Professor Neyt's efforts, lately described, and which I do not thoroughly comprehend, and other communications which have from time to time appeared in your Society's Journal. Before, however, discussing these matters I will, as briefly as possible, give the manipulation adopted in my own case:—

1st.—The glass employed should always be patent plate.

2nd.—Cleaning same, for which purpose I always use old collodion, which consists of a mixture of all sorts which have become too old for use.

3rd.—The collodion to be used should give a remarkably tough film, one that will bear any amount of intensifying without, after having obtained a good picture, finding that it splits across in contracting, or dries off the plate. The best I have found to answer is half Thomas's ordinary negative with half Ponting's, and I would also add Mawson's new iron negative collodion (this latter being perhaps the best of any), all of which are used with a slightly acid bath.

4th.—The developer, which is simply a fifteen grain to the ounce solution of protosulphate of iron, together with fifteen minims of acetic acid, and one ounce of water. If this does not come up to the mark, intensify with pyrogallic acid and silver solution before fixing them: fix in saturated solution of hypo. Should the negative after this be not sufficiently dense, I employ a solution of iodine in water, with sufficient iodide of potassium to procure a solution of the iodine, and then pour on until the film is changed to a greenish colour, again using the pyrogallic and silver. Of course great promise must be given that the negative is worth this outlay of time and patience, as in nearly every instance it is possible to decide at once when the iron developer is poured on.

I now arrive at a very essential part of the operation, viz., the exposure; and I will frankly confess that the whole of those that I have done have been by diffused daylight. The light from the sun would, if brought to a correct focus or point upon the object, very soon unsettle the balsam with which it is mounted; and I have always found that a piece of white card, slid in the groove which carries the under stage plate, enabled me to arrange the illumination of the object, and, at the same time, protect the lens in use. Direct sunlight has the disadvantage of causing unnecessary glitter, which is extremely difficult to manage, even if the whole of the connecting tube is blackened; and, although the difficulty might be obviated by using black cloth to line the body of the microscope, still some small portion must remain unprotected to admit of a range for focussing by the rough adjustment.

I cannot reconcile the time of exposure given by the current literature on this subject at all. In all the photographs of insect structure and woody fibre before you the exposure was from four to five and some eight minutes, and some would have borne another thirty seconds with advantage. Yellow, such as the cricket's tongue and palate of slug, appear to take just as long; but in the case of the *Diatoms*, taken with a quarter-inch objective of 95° aperture, made by Anderson, the exposure was almost instantaneous, the mere fact of raising the dark shutter and lowering it again being sufficient.

Although I have repeatedly attempted it I have never got satisfactory results with artificial light, although I have done away with the mirror and used two bull's eyes for concentration. The exposure I have tried has varied from ten minutes to thirty, and

although a picture has been formed, still nothing from which a satisfactory print could be got has been obtained.

The lamp used is before you, which is of a somewhat novel character, and is one which I have had constructed for my other microscopical purposes.

I believe the great difficulty to be overcome appears to be the difference between the visual and chemical focus; and although when that difference is once ascertained, it is very possible to keep a record of it, still more or less it appears to vary with every object—the thickness of the object and its covering very probably being the cause. Although this also appears to have been combatted by means of employing a lens posterior to the objective, I have not had any experience in its effect, and should be much obliged by any gentleman stating the benefit of his own experience with an objective so fitted.

I am well aware that it is almost hopeless to expect to secure photographs that shall vie with the objects themselves as seen in the microscope; but still the desire to secure a representation of such objects must, I am sure, be more or less implanted in the mind of any gentleman given to microscopical pursuits.

Again, the extreme beauty of some of the objects prepared for the microscope would, I am certain, well fit them (as photographed) to be used as a basis upon which designs might be made for ornamentation or otherwise.

The doubts and uncertainties which from time to time arise, too, in microscopical examination, might also perhaps be solved, could we, as it were, commit them to paper. By the aid of photography they would be open to discussion as viewed by everyone, and in all probability the verdict of the many would, perhaps, ultimately convince the few.

These ideas somewhat crowd upon me when we take into consideration the microscopical examination of those beautiful structures the *Diatomaceæ*. Some, no doubt, among you having spent many a pleasant hour in bringing out the lines and depressions exhibited upon nearly all of them. Of course the higher the power used the more delicate becomes the operation of finding the focus, as in the higher powers that point must be in a very circumscribed space. Still, for obtaining the ultimate resolution of the structure of any object, it would be necessary to push the magnifying power.

I am afraid that in the arrangement before you there is little that is new—the one novelty only being that it keeps the microscope intact, and that the object can quickly be found and focussed. Neither am I in a position to say what is the effect as regards the lengthened exposure when polarised light is used, or whether dark ground illumination exercises a retarding effect upon the sensitised film. These are queries upon which I should gladly hear the opinion of some other more able operator; and if my statement shall in any way have contributed to wile away half-an-hour, and be the means of causing any suggestions towards the manipulation or use of the microscope to be brought forward, I shall be glad. With these concluding remarks, I beg you will accept my thanks for your patient hearing of what I fear to many must indeed be old news.

ON THE EXPENDITURE OF SILVER USED IN PHOTOGRAPHIC OPERATIONS, AND ON THE SAVING THAT MAY BE EFFECTED.*

By William Tudor Mabley.

In the early days of photography but little was thought of the expenditure of salts of silver: we were only too happy if we gained satisfactory results, irrespective of expense. As the art advanced it was observed that but a very small portion of the silver employed entered into the composition of the picture; and those who practised it largely began to turn their attention to the saving of that which had been allowed to flow away from the sink.

At present professional photographers, for the most part, economise their expenditure of silver solutions, but the great bulk of those who practise the art as amateurs do to this day throw away a considerable quantity, which may be easily saved: there are indeed some among professional photographers who still do so.

The purpose of my observations this evening will be to show what quantity of nitrate of silver is taken up by floating paper for printing purposes, how much of that quantity may be recovered, and what savings may be effected from other sources of waste.

It has been asserted that only five per cent. of the silver employed in sensitising paper goes to form the picture. This may be; but what I propose now to do is to state the amount that can, in ordinary manipulation, be recovered with very little trouble, and without any great aptitude for chemical operations. It must be understood, therefore, that larger quantities than those I shall mention may be obtained if the processes be followed out with chemical accuracy. I may state that the results I shall bring before you are reliable, they having been arrived at by working with considerable quantities, and having been verified by repetitions.

To carry out the first point—viz., the expenditure of silver—I floated fifteen whole sheets of paper; and this I did the one after the other, so as to avoid any error which would arise from allowing the solution to remain any length of time in the dish, or from the pouring of it backward and forward. These fifteen sheets were floated upon a bath of nitrate of silver, containing fifty-six ounces, at seventy grains to the ounce. Immediately this was done the solution was again measured, and was found to have lost seven and a-half ounces; but, at the same time, it had decreased in strength down to sixty-two grains to the ounce. The original bath, therefore, contained 3920 grains of nitrate of silver, and the bath, after the floating of the paper, 3007 grains—showing a diminution of 913 grains, and an appropriation by each sheet of sixty grains, or one drachm, which, with nitrate of silver at four shillings the ounce, is just sixpence in money value. It must, however, be remarked that the result will somewhat vary accordingly as the paper has more or less albumen, more or less chloride, or is thick or thin. The paper that I used was of an average quality of albumenised paper, and the result may fairly be taken as an example.

I now proceed to state how much of this may be recovered. The first thing is to save the drippings. The most convenient method of doing this, to my mind, is to suspend the paper from a cord, which is placed in an inclined direction over a board, or anything that will carry a cup to receive the drippings: the remaining moisture may be drawn off by a piece of bibulous paper. In this manner I saved from the fifteen sheets of paper one and a-half ounce of solution, containing eighty grains of nitrate of silver.

The next point is the recovery from the washing of the prints before toning. This operation of freeing the prints from nitrate of silver is not so easily accomplished as might be expected. It adheres to the paper very strongly, and the bulk of it can only be removed by at least three changes of water. The prints should soak in the first water for fifteen minutes, and be afterwards moved about: the operation is greatly expedited if hot water be at hand. Prints washed in this manner gave for the fifteen sheets of paper a solution which yielded 350 grains of chloride of silver.

I now come to the hyposulphite fixing bath, which is thrown away more frequently than the water used for washing prints. This, for the fifteen sheets of paper upon which landscapes had been printed, yielded 180 grains of metallic silver. The methods adopted for precipitating silver from the washings and fixing baths are to be found in all books on photography. I may, however, mention that it will be found desirable to keep two stock jars—one for the washings, and one for the fixing baths. From the former of these chloride of silver may be precipitated by the addition of common salt; but such a proceeding cannot be adopted in the latter, as chloride of silver is soluble in hyposulphite of soda. Another course must, therefore, be adopted, and the most simple is to add sulphide of potassium, and thus precipitate the silver as a sulphuret.

My reason for recommending the use of two jars is, that when chloride of silver can be precipitated, it is of a known value; the sulphuret, however, arising from the use of sulphide of potassium is a variable compound, and the quantity of silver it contains can only be ascertained by trial. Sulphide of potassium has, however, a very disagreeable odour, and the operation should, therefore, be conducted out of doors. There are other methods which do not involve this inconvenience, and for which I refer to Hardwich's *Photographic Chemistry*, &c.; but the plan I have mentioned is the most simple, as the precipitation may be done in the old way, and may be continuous.

If an excess of chloride in the one case, and sulphide in the other, be kept in the jars, the operation goes on, and it is easily ascertained whether they be exhausted, by removing a small portion of the clear liquid, and testing it with a fresh solution of chloride or sulphide. As the latter substance, however, is sometimes slow to act in the case of weak solutions, a small quantity of sulphuretted hydrogen gas may be used; but a better method is one which I have adopted at the suggestion of Mr. Caro, an ingenious chemist in the establishment of Messrs. Roberts and Dale. It is simply this:—Take a test tube, and partly fill it with some of the clear

* Read at a meeting of the Manchester Photographic Society, April 2nd, 1862.

solution; in this place a small quantity of caustic soda, so as to make the solution caustic, drop in a fragment of grape sugar, and heat the whole over a spirit lamp or gas-burner: if there be a trace of silver present it is immediately precipitated in the metallic state.* This method is indeed the best that can be adopted for dealing with the bulk of the solution, if the trouble of heating it be not regarded.

So far the savings treated of have reference to the printing process; but there are other sources of loss to the photographer. For instance, it is a common practice to wash out vessels which have contained nitrate of silver at the sink. I find that a dish for floating a whole sheet of paper, and which is 24 inches by 20, retains upon its surface a quantity of solution, at sixty grains to the ounce, which after close draining yields 25 grains of chloride of silver; and when we consider how often this operation of washing dishes, measures, bottles, and other utensils takes place, it will be seen that a great loss is sustained.

Again: it is a very common practice to throw away filter papers. I find that such a piece as this, and which is 8 inches in diameter, retains 15 grains of nitrate of silver, the solution used being 60 grains to the ounce.

In preparing dry plates, which have to be washed after leaving the silver bath, there is much to be saved. In washing a series which gave a combined area on one side of 480 inches, and which were sensitised in a 30-grain bath, the washings afforded 35 grains of chloride of silver.

There is also a continual waste by spilling solutions, and these may be recovered simply by keeping blotting-paper at hand to absorb the fluid.

In developing collodio-albumen plates a large quantity of silver is often required to get up the intensity, and a very small quantity of this goes to the picture: as it is renewed when it becomes dirty a great sacrifice is made. This refuse may be added to the stock jar containing the hypo. baths.

HINTS ON THE NATURE OF PICTORIAL BEAUTY AND THE PRINCIPLES OF COMPOSITION.†

By W. H. Davies.

Part II.

Our next analysis is of a much more complex, although apparently more simple, character of picture, and, being one which shows the inventive power of the artist, deserves our careful consideration. Observe that it was Titian's business to make portraits of the *Marquis de Guasto and his Wife, Mary of Arragon.*



And here we see the boldness of genius; for, instead of two plain, uninteresting figures, he has made of so simple a subject a picture in which we can take great pleasure without a thought that they are merely portraits. The skilful introduction of the Goddess of Beauty and her son is made symbolical of the loves of the principals in the composition; and, as if he felt that they would otherwise have had no purpose in being where he has placed them, he has introduced the servant bearing a basket of fruit, suggesting refreshment—the introduction of which balances the figure of the lady, and prevents the composition from being one-sided.

I need hardly point to the varied turns and positions of the heads, as they explain themselves; but note the easy way in which the almost photographic closeness of position is managed. Were you to place any five figures *so*, there would be no difficulty in focussing the whole of the heads.

It is a specimen of a totally different form of composition from that of the *Home*, being a good example of the circular, and one which we will find valuable as a study for our purpose. Although I call it circular, it is by no means rigidly so, although the line of the heads, which we must take in this example as our leading line, suggests circularity most decidedly: it may more properly be called the elliptical, as the circle is in perspective. Although the mass of the lines are of a flowing, graceful character, yet Titian knew too well that there must be contrast; and accordingly he attains that by placing a perpendicular line near the centre of the picture, which by its very rigidity makes the upright mailed figure of the Marquis appear comparatively graceful. As a contrast to these perpendiculars, you will observe the horizontal line formed by the arm of the lady, and continued across the picture by the straight bundle of rods or arrows which the Cupid carries on his shoulder, and which serves as a basis or support to the whole composition. Although this suggests the horizontal, notice how carefully the artist has broken the line in various parts to prevent its being obtrusive or objectionable—first by the boy's head, then his hand; then again by the sphere, the lady's hand, and the curved line of her arm; then by the drapery which leads by the shoulder to her head, which forms the second point on this line, and brings us directly to the strongly-pronounced and masculine head of the Marquis. From this point the line divides the outermost, catching the basket of fruit and the head of the bearer of it, and sweeps inward by the graceful little Cupid in the foreground, returning to the globe from which we started. You will observe that I have not spoken of the head of Venus, but would now instance this as an example of the scientific knowledge of Titian in bringing her within the circle, and apparently breaking it, but in reality creating another within the outer—thus getting the needed repetition of the circular line on that side of the picture. Note how skilfully too he has avoided bringing any of the heads immediately under the other, thus giving the appearance of accidental combination to what is in reality the result of the most masterly, scientific contrivance.

We will turn now to the *Marriage of St. Catherine*, by Albano,



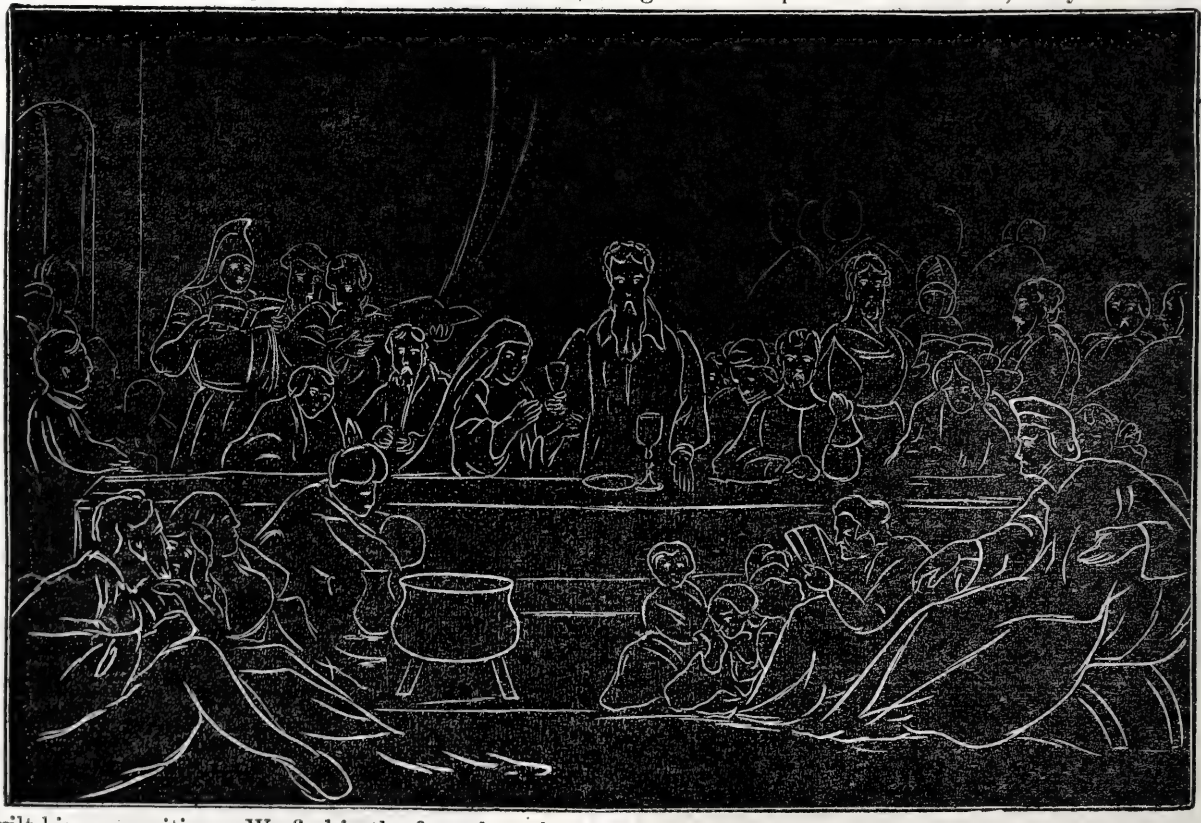
* Mr. Mabley illustrated this experiment.

† Concluded from page 149.

a picture of eight figures, which is likewise a circular composition, and a much plainer example of it. The circularity of the basis of the picture will be at once apparent. Starting from the figure of the Pope on the right, the composition sweeps inwards and outwards to the Virgin and infant Jesus, where it again returns by the St. Catherine to the figure of St. John, who most exactly balances the kneeling Pope, and whose hand serves as an index to direct us at first sight to the point of interest of the picture, thus fulfilling the requisite I have already insisted on of the desirability of leading the eye at once to the principal object in the picture. The figure of the Pope would have a strong tendency to fall out of the composition did not the rigidly upright line of the pillar at his back at once prevent this. As we found in Noel Paton's *Home* the line of the floor carried right across the picture by the tongs and other horizontals, so here we find the foreground horizontal lines repeated similarly by the cushion on which the Pope kneels, balanced by the legs of the kneeling St. John, the lines of the steps, and higher up by the moulding on the architecture, finishing with the palm branch in the hand of the floating angel. The perpendiculars are not carried across the picture, but the balance is got by the mass of foliage on the left and supported by the cross of St. John—thus illustrating another of our principles, viz., that mass rather than form should produce the necessary balance—although this is not carried out through the picture. The figures of the St. John and Pope being both oblique and outwards in inclination are almost equally balanced—and at first sight the cross might seem to follow this inclination too rigidly; but a moment's investigation will convince that if it had been placed on the opposite angle, bringing it cutting against the principal figure, it would have been very objectionable. This picture in the figure portion may be looked on as an example of the principle of balance carried out almost to formality, and which is yet picturesque by the skilful breaking of the lines of the composition. Floating boys, of course, would be difficult to be got as objects in a photographic group; but their absence in the composition would not spoil it for our use as a guide.

The next and last of our etchings from the Scottish National Gallery is that of *John Knox Administering the Sacrament at Calder House*, the last work from the hand of our immortal countryman, Sir D. Wilkie, and of which his lamented and untimely decease prevented the completion. However much we may regret the loss to the world of what promised to be the artist's *chef d' œuvre*, for our present purpose it is better that it is left so, as we are thus enabled to see the actual groundwork of lines drawn by the artist on his canvas, and on which he has placed his figures and built his composition. We find in the first place that, like Leonardi da Vinci, in his *Last Supper*, he has divided his picture by a central perpendicular line, on which he has placed his principal figure, Knox, and that he has also divided it horizontally into four equal parts by lines. The upper line of the table is brought slightly below the central horizontal line, and the heads of Knox and of the standing figures in the picture are near the one above; but observe here that he only uses this line to give what we may paradoxically call a varied uniformity as no two of the heads are exactly the same height, or occupy precisely the same position in relation to each other, which is (broadly stated) the fundamental principle of all picturesque composition. Mark, while looking at the picture, that the heads of the standing figures, with the book and tray on the left of Knox, make an agreeably varied concave curve; while those to his right form another but different form of the same curve, till it reaches the highest figure of that group, where it changes to a convex. Knox's head is purposely left isolated to give it importance, while the rest of the figures are grouped in twos and threes. This is a very important feature in this picture. As noticed in the others, all the objects and figures have an inward tendency in the direction of the central idea of the composition and point of interest of the picture. As a proof of this, try the reversal in idea of one of the foreground pictures, and place him with his feet outwards, and you will at once discover the incompleteness of the composition. The long uninteresting line of table has been skilfully broken and hid by the figures and objects which come on and in front of it, and which prevent it in any place becoming disagreeable. Starting from the right-hand figure, the feet of the foreground figures make an irregular semicircle, leaving the space in the centre only open, which leads the eye directly up to the commanding figure of Knox. It may be urged that it would be impossible to group and focus correctly such a number of figures, and in so many planes, which may be partly granted; but still I can show you as difficult feats of focussing by using orthoscopic and single combinations with sensitive chemicals instead of the ordinary portrait lens. Would it not be better, then, that where groups of scholars, church sessions, municipal bodies, and such-like pictures are wanted, that there was at least the attempt to group them picturesquely instead of in the usual regimental rows we are accustomed to see. Surely that were "a consummation devoutly to be wished for."

I have thus indicated what seem to me to be the chief points necessary to be observed and acted on in the composition of pictures, whether produced by the chemicals and work of the painter (for all colours are chemicals, and several of them produced by the highest development of the science) or by the chemicals and work of the photographer. I know that artists proper will object to this classification; but the time has arrived for insisting on it, especially as we see those in power putting our work quietly down among that of mechanics and machinery. If the same rules of arrangement apply to the two arts in mostly every case, with the single exception of colour, where can be the great difference between them? But I expect no concession on this matter that we do not conquer; and it rests with you to prove, by the application of the laws I have indicated, that we mean to compel recognition of our claims by the sheer force of quality, and by showing that in a newer, fresher, and, in some respects, better field, our art is as well fitted to teach through the eye as is that of our brethren who have so long held that monopoly. Remember that there was a time in the history of painting when its professors neither enjoyed their present amount of reputation nor had they done so much to deserve it; for



painters have had to grope their way through the long, lanky saints and disjointed apostles of the Byzantine and Greek artists of the earlier centuries, up to the advent of Cimabue and Giotto, and improving through their disciples up to Brunelleschi, Ghiberti, Mantegna, Massaccio, Perugino, and culminating in Leonardi da Vinci, Michael Angelo, Raffaelle, Domenichino, and Titian.

Surely this ought to afford us good grounds of hope, for our art has hardly taken more years to grow to what we know it to be than painting has taken centuries. Looked at in this light, it seems to have been, like Minerva, born full-grown, armed, and equipped. Let me hope that we will adopt her spirit of wisdom, and go on till we reach perfection.

THE SELF-REGULATING PNEUMATIC FILTERER.*

By J. Jex Long.

In all our operations there are three great and material points that demand our special attention and calculation, viz., simplicity, economy, and certainty.

In the arrangement of the apparatus I am about to exhibit to you I have endeavoured to combine all three. How far I have succeeded I leave to your able judgment.

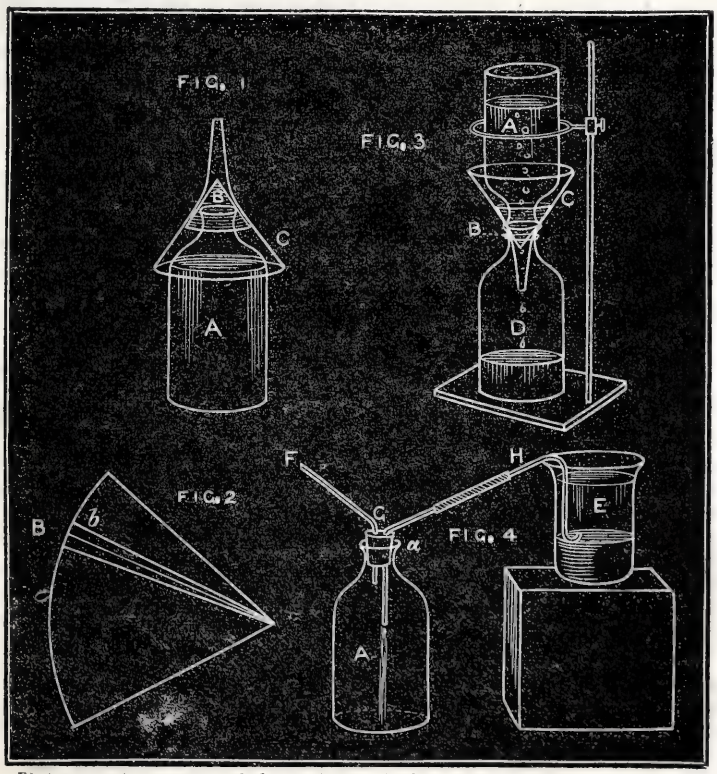
1st. The management requires so little skill that the most inexperienced tyro will find no difficulty in using it.

2nd. It involves no additional expenditure, as every manipulating room already contains the necessary vessels, &c.

3rd. When once set agoing it needs no further attention, but continues its action with the greatest regularity and certainty, no matter how long the operation may require for its completion.

It has also another great recommendation, as almost an unlimited quantity may be filtered through a small surface of the filter. As air is the regulating power, I have named it the "Self-regulating Pneumatic Filterer."

It is a well-known fact that liquids will not flow from a vessel except air is admitted to fill up the vacancy; for, if you take a bottle filled with water, and invert it, the water does not run from it in a continuous stream as through a funnel, as the air exerts an upward pressure, thereby preventing the liquid from falling; but the weight of the column of water forms a partial vacuum at the upper part of the bottle, a bubble of air is drawn up through the water, and in consequence a like quantity of water flows from the bottle, and so on in succession.



Taking advantage of these facts, I place the liquid to be filtered into a common stoppered jar or other vessel having a smooth circular rim, as shown in *fig.* 4, A*a* (which forms a part of the decanting apparatus to which I shall presently allude), and proceed to fold a plain filter of sufficient size to extend about half-an-inch over the rim of the jar A. The outer fold of the paper I double several times (as seen at B *b*, *fig.* 2), and place it into the funnel C. I then invert C with the filter B over the rim of A (as seen in *fig.* 1), holding it with the left hand, and, by the assistance of the right, steadily but quickly invert the whole over the vessel D to receive the filtrate, supporting A by the ring of a retort-stand, as shown in *fig.* 3. Bubbles at once begin to ascend through the liquid in A as the liquid descends through the filter into D, the air forcing its way through the space between the funnel and the rim of the jar A, formed by the several folds in the paper filter, as shown at B *b*, *fig.* 2. It will now continue its action without any further attention whatever.

The saving effected in filtering silver and gold solutions by this method will be apparent to you all, as the surface of a crown piece will suffice to filter any quantity.

When the precipitate is bulky, it would be better to allow it to subside, and decant the solution. *Fig.* 4 shows a simple method and apparatus. The long end of the tube H is drawn out a little smaller and bent up at the point: this prevents the current from disturbing the precipitate.

Place the vessel E in a raised position, so that the longest tube in A stands below the end of the tube H. Apply suction at F: the liquid will pass over from E to A, on the principle of the syphon, until the liquid in E falls to the point of tube H. The liquid in A can then be filtered, as before described, with facility.

* Read at a meeting of the City of Glasgow and West of Scotland Photographic Association, April 10, 1862.

THE NEW PICTURE GALLERIES.

By A. Claudet, F.R.S.

[We have been favoured by M. Claudet with the following pertinent reply to an impertinent and, we must add, ignorant, attack upon our art, which was transferred to the pages of the *Journal of the Photographic Society*.—Ed.]

The *Journal of the Photographic Society* has inserted in its No. 118 (Feb. 15), an article from the *London Review*, in which, alluding to the rage for photographic *cartes de visite*, a writer has drawn a sarcastic description of these "New Picture Galleries," with the apparent intention of turning generally into ridicule the mode of producing portraits by means of photography.

Although, by printing this article without comment, the *Photographic Journal* has shown that the art can witness such attacks with the greatest indifference, I had hoped that in the following number of the Journal some member of the Photographic Society would have replied to it; but as that has not been done, I desire to express the indignation I feel at the unqualified aspersions of the critic in question.

If the writer of the article on "The Picture Galleries" had been content to criticise the unsuccessful attempts of inapt practitioners, he might have found ample ground for exercising his wit, and would have been perfectly justified in endeavouring to deter incapacity from meddling with photography. In doing so he might have rendered a signal service to the art. But he has generalised his remarks, striking, not the failures, but the art itself and its principles, accusing it of all the miserable productions of those who are incapable of understanding it; and he has arrived at this strange and absurd conclusion, *that no true likeness can be taken in this way*.

Does this conclusion agree with the remarkable fact that every one has his likeness taken by photography in preference to any other process? For, notwithstanding its supposed defects, it is the surest way to obtain likenesses perfectly true and characteristic, and in this respect more satisfactory than those which are embellished by the portrait-painter, which, according to our critic, are "*the result of study and generalisation, qualities lacking in an ordinary photograph.*"

Still, there is a class of persons who instinctively hate photography as heartily as socialists hate aristocracy—those whose features are either common, ugly, or unmeaning, and those of both sexes who recollect, naturally not without regret, the time when they did not wear a wig or dye their hair. We may well imagine what their feelings are when they look at themselves in their toilet-glass; and, surely, if these fragile manufactures were a new invention, they would be likely to receive more destructive blows than praises for their catoptrical performances. It is, indeed, for this numerous class that portrait-painting is *more true than photography*, and that *photographic likenesses are nothing but caricatures*.

If so many have obvious reasons for being dissatisfied with their lot in the dispensation of the graces of nature, it is not surprising that they should generally complain of their appearance in a *carte de visite*.

We find that our photograph is ugly, therefore we have been disfigured by the artist, or rather by his camera. To convince ourselves that it must be so, we look at the likenesses of our friends; and as we have a great number of friends who, like ourselves, are exceedingly plain, we exclaim, in delight, "Oh! it's no use to deny it, photography can only produce *caricatures!*" Of course, if we have been ill-treated, it is the fate of every one and the fault of photography. Decidedly this art is detestable: let us turn it into ridicule!

Our task will be very easy. We have only to stop at certain shops in Regent-street, where are exhibited for sale the most heterogeneous assemblage of *cartes de visite* of emperors and empresses, kings and queens, princes and princesses, the Pope and his cardinals, bishops, generals, ambassadors, ministers, orators, philosophers, preachers, actors, dancers, acrobats, pugilists, and gorillas, all in a row of perfect *égalité, fraternité.* Are not the greater number of them miserable specimens of photography, printed in a horrid gingerbread tint, "*some out of focus, the generality badly posed, and standing or sitting in the centre of perfect chaos. Panels of walls, doors, jars of conservatory flowers, tables, and other articles of furniture, lean, roll, and tumble about the apartment, as if spirit-rapping was going on, in every position out of the perpendicular. The central figure may be in focus and straight; but even if she escape with no distortion, such as a monster hand or foot, or a cheek that seems afflicted with the mumps, all her* entourage *is reeling about her, as if she had been taken in the saloon of the big ship during the great storm.*"

I suppose that this lively and most picturesque description is perfectly correct, and I have no doubt that the critic of the *London Review* has seen such hideous photographs, and has not exaggerated their defects for the mere pleasure of appearing witty; but what has all that to do with photography? Is it absolutely necessary or unavoidable that the camera should produce pictures *distorted and out of focus; that the persons should be badly posed, and standing or sitting in the centre of the perfect chaos, and surrounded with pieces of furniture, leaning, rolling, and tumbling about the apartment, &c.?*

If these defects are the result of bad instruments, and of the ignorance and stupid management of clumsy photographers, it is perfectly ridiculous to accuse the art of being their cause. Nevertheless such a theme has been thought a subject fit for a serious paper, and an intelligent man has not found it an ungenial task to disparage an art so beautiful and so perfect as photography for the poor satisfaction of running down what is generally admired. At all events, it was unworthy of the *London Review* to have permitted the publication of such diatribes against the greatest feat of modern philosophy and ingenuity, and one of the most marvellous discoveries of our age.

In stopping before the shops exhibiting photographic *cartes de visite,* you have seen nothing but *caricatures.* Be it so. But is it owing to the ugliness of the photographs, or to the ugliness of the persons represented? It may be either, or it may be both; but, whatever it is, that has nothing to do with photography.

If, after a walk along Regent Street, you had chosen to describe the strange diversity of the perambulating multitude, would you have found much to say in praise of the refined expression of countenance of every one you had met—of the beauty of form of every individual, male and female—of the distinction of their bearing, the elegance of their manners, and the taste of their dress? I rather think that you would have returned home very little charmed with your physiological study.

Among those who had passed before your eyes, judging only from their external appearance, might you not perchance have mistaken a nobleman for a farmer, a legislator for a publican, a bishop for a schoolmaster, a clergyman for a waiter, a Russian prince for a commercial traveller, a banker for a tea-dealer, an eminent writer for a toast-master? But if, instead of the reality, you had seen only the photographs of these persons, with their distinguished names written at the foot of their *cartes de visite,* would you not exclaim, "Oh! these cannot but be *caricatures!* it is just what might be expected from photography?"

In plain truth, photography caricatures because it represents too faithfully the individuality, and because too many individualities are nothing but caricatures of mankind. No doubt a clever painter might be able to represent the same individuals in such a manner that they would all appear gifted with the mien appropriate to their mind, rank, and station: the nobleman aristocratic in his bearing—the legislator exhibiting the mind of a Solon—the bishop venerable and dignified—the clergyman evangelical and modest—the Russian prince noble and elegant—the banker important and grand—the writer full of thought and inspiration.

Photography represents people as they are, and painting as they ought to be, or as they would like to be. The last may be more agreeable to the persons represented; but the first is more satisfactory to those who want the truth, and do not care for the fiction of poetical treatment. In description there is nothing like good, plain, and intelligible prose. For truth there is nothing like a mirror. And is there anything more resembling a mirror than the camera of the photographer?

Ask a mother whose son is travelling in distant lands and seas, which likeness she prefers—the *carte de visite,* or the painted portrait of her dear boy? She may be proud of the latter in its splendid frame, and in showing it to her friends she may exclaim, "Don't he look handsome! What an agreeable and distinguished expression!" But depend upon it, when alone, that mother, with tears in her eyes, will be thinking of her son: she will look for him, not on the wall of the drawing-room, but in that *elegantly-bound album containing some thirty or forty "so-called likenesses,"* and, in her case, very justly so called, for among them she finds the real and truthful image of her absent son. With what rapture at the end of twelve months will she open a letter from the young man containing another *carte de visite* taken at Calcutta, Hong-Kong, or New Westminster, showing him with a grown beard, in his new garb adapted to the country, looking full of health and spirits! Imagine, on the other hand, the pleasure of the son when, in return, his beloved mother has enclosed him in a letter her own *carte de visite,* and, perhaps, that of an equally dear sister. I can guess what will be the first and irresistible impulse of his heart: in transport he will press these precious *cartes de visite* to his lips! And thou, cold sarcastic critic, hast no other name for photography than "caricature!" *Mais vous n'êtes donc qu'un barbare!*

Have you ever understood what is photography? Have you studied the beautiful and unerring principles upon which it is based? If you had, the most imperfect photographic production would be a source of admiration to you. The great Newton himself would have been in ectasy had he the good fortune to witness such an unexpected result of some magic property unknown to him of that light he had profoundly investigated during his life, and the principles of which he had so successfully unfolded.

We see the forms of all the works of creation by the light they reflect. The rays being refracted through a lens that nature has placed in front of that wonderful instrument called the eye, form on the delicate membrane of the retina the image of all external objects. The eye in reality is a camera obscura, and photography is nothing else. The only difference between the two is, that in the eye each separate ray communicates on the retina the particular colour belonging to it, while in the photographic camera only one ray, called the actinic, can act upon the photographic surface: consequently the retinal image has all the colours of nature; and the photographic image has no colour, being only like a mezzotint engraving. In every other respect the result is the same—the forms, proportion, and perspective in the camera being as perfect as those depicted on the retina.

Now, the science of optics teaches us how to construct lenses producing an image as perfect as that formed by the lens of the eye. If so, why should a photographic picture be distorted more than a natural one? Therefore, let the photographer produce a perfect lens; and if he knows how to use it, he will produce a representation of objects in their exact forms. With such a lens, and operating upon a very highly sensitive preparation, he will be able to take a portrait in a few seconds, and, in truth, even instantaneously, catching the fleeting expression of the moment. Therefore, if he has the skill and taste to light his model artistically, to place it in a natural and becoming position, waiting only for a suitable and pleasing expression of the countenance, he will produce, not a caricature, but the most satisfactory portrait, and by careful management, I have no hesitation in asserting, a flattered likeness of every one.

Notwithstanding the remarks of our critic, the features of women can be photographed as successfully as those of men. Of course, in bad photographs out of focus and improperly lighted, the strongly marked and hard outlines of men may, without losing all their character, bear a greater amount of defects than the delicate forms of youth and gracefulness. But the apparatus, chemical manipulation, and artistic arrangement which are capable of producing a perfect photograph of men will do ample justice to the most refined and beautiful features which may grace the other sex. In fact, photography, which can represent the cylindrical curve of a marble column, or the roundness of an ivory ball, only by means of an almost imperceptible gradation of tint, can also by the same

means delineate the softness of youth and grace with a perfection which no painter is able to approach by the most delicate touches of his brush.

We have to consider photography as any other art—in its capabilities of perfection, and not as the performance of those who do not understand it. Would it not be the height of absurdity to condemn music because all the day long we hear shrieking songs and the horrid whistling of ragamuffins, as to condemn photography because at every corner we see disgusting photographs? Music out of tune is as intolerable as photographs out of focus. But we must submit to the annoyance to which we are exposed not only in our walks, but in the drawing-room, where, after having been treated with the sight of the elegantly-bound album of *cartes de visite*, we are invited to listen in silence to the screaming song of the young lady of the house with an accompaniment on her piano out of tune. If so many desire to be musicians, why not so many desire to be photographers, when to be so they have only to buy an instrument?

If we wish to hear good music, we go to the opera and the concert-room; and if we want to have and to see good photographs, let us go to some respectable gallery, and not to the "dusky abode" of some miserable charlatan. Probably there are in London photographic establishments fit to receive good company, where the art is practised with skill and taste, and where correct and pleasing portraits are exhibited.

Our critic has adopted another course, if we may judge from the following description he has given of his photographic trip:—"*Which of us is so fortunate as not to be able to recall sufferings in the* inferno *of some eminent photographer?—to recollect how, while waiting our turn to pass into the dusky abodes beyond, we surveyed, in all the misery of protracted anticipation, the shadowy forms of those who had before passed under the operation, searching, like bereaved relatives in a Morgue, for the disfigured appearance of a friend.*"

Certainly the writer must be pitied; but has he not richly deserved his fate, if, wishing to have his portrait enshrined in his friend's album, he has selected for the operation such a strange place as the *inferno* of a photographer?

How can we explain his bad fortune, except by supposing that, having only the Sunday for leisure time, he has been obliged to choose, among the numerous suburban anti-sabbatarian "artists," *an eminent photographer* of Wapping *to portray his features by his painful process, and while waiting for his turn in his dusky abode*, he has seen *the portraits of some fair creatures as vulgar as clowns at Bartlemy Fair?—almost all having a cast in the eye, others having an unmeaning grin, or a silly smile, or a surly frown; one of the young ladies looking saucy, another melancholy, and another having that dangerous look that Petruchio himself would not dare to marry her.*

Perhaps, after all, if the critic has got a bad photograph, he has been a most fortunate man, and may be congratulated about his Sunday photographic trip. I am sure he did not leave his heart in the dusky abode of Wapping in looking at the portraits of the fair creatures exhibited in the "saloon" of the artist. At the same time, wishing a lucky chance to all "fair creatures," we warn them, if they wish to be married, never to risk themselves in any dusky abode, or to visit the *inferno* of the eminent photographer in which our critic had to endure such dreadful sufferings.

ON A NEW "FINE ADJUSTMENT" MOTION APPLIED TO COMMON RIGID CAMERAS.*

By M. Noton.

Cameras constructed on the Kinnear principle have an advantage over the ordinary ones, in a great facility for focussing, by means of their long screw.

This disadvantage of the common rigid camera I have now neutralised by the simple contrivance which I this evening lay before the Society.

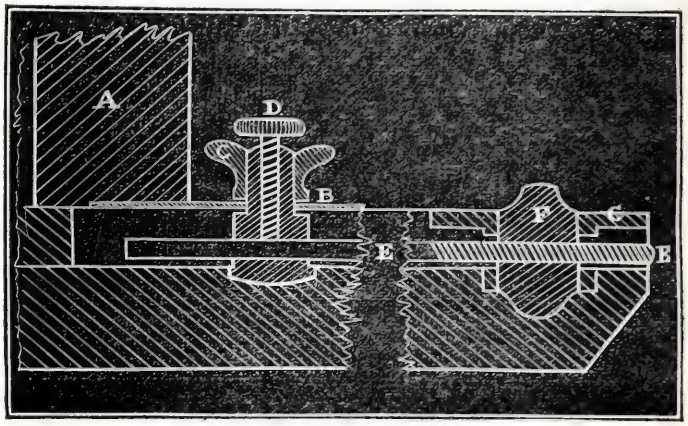
With lenses of 16-inch focus, and upwards, attached to a common camera, the adjustment is often troublesome and uncertain, generally requiring both hands to move the sliding end carrying the ground-glass: the binding-screw being then slack there is a risk of a slip, and, if not detected, a picture not sharp.

The "fine adjustment" motion at once releases one hand entirely, which, with those who use a magnifying glass, is a considerable advantage. Then, having once arrived at the adjustment of the focus, the certainty of its remaining so is satisfactory.

This motion applied to all cameras would make the rack and pinion in portrait lenses not wanted. They could thus be much simplified, reduced in weight, made more compact, and at less cost.

* Read at a meeting of the Manchester Photographic Society, April 2, 1862.

The comparison between the visual and actinic focus also could be made precisely. Supposing the adjustment-screw to have 25 threads to the inch, and the nut divided into four divisions, each one would represent the one-hundredth part of an inch on the ground-glass.



Explanation of the Mechanical Details.

A, sliding end of camera. B, piece of sheet brass through which the binding-screw C passes as usual, except that the bolt and nut is larger to allow a hole to be drilled and tapped down the centre of it for another small milled-headed screw, D, capable of confining the sliding part A to the rod E; also a hole, at right angles, through the square under the bolt head, for the rod E to slide through easily. F, a milled nut turning upon the screwed end of the rod E, and enclosed in the small fixing G.

In preparing for work the nut C and screw D are both slackened: the back of the camera is then at liberty to be moved outwards or inwards by hand, as usual, and the view roughly focussed. D is then tightened, and the exact adjustment of the focus completed by turning the milled nut F. The nut C may then be tightened, and D eased, or not, at pleasure.

STRAY CHAPTERS FOR PHOTOGRAPHERS.

By James Martin.

CHAPTER III.

DIALYSIS APPLIED TO PHOTOGRAPHY.*

It is a fact very generally known to those who albumenise paper on a large scale, that there is an absence of uniformity in the character of the sheets of paper forming parts of the same ream, although they be floated throughout on the same batch of salted albumen prepared at the outset in quantity amply sufficient to coat the entire ream of paper.

This want of uniformity has manifested itself, not so much in the physical appearance of each sheet, as in the result of the chemical treatment incident to the printing and toning of the paper; and the inference deducible from these results has been that the paper in the course of albumenising absorbs the albumen and the chlorides unequally, so that the proportion adhering to the sheets or remaining in the albumenising pan is not the same at the end as it is at the middle or beginning of the preparation of a ream of paper.

The difficulties in the way of resolving this question have hitherto proved insurmountable, in the ordinary way, by photographic operators, and the reason will appear upon a review of the facts of the case.

The mixture to be submitted to a quantitative examination is one of albumen and soluble chlorides. If nitrate of silver be added with the hope of obtaining an insoluble chloride of silver from which to estimate the amount of chlorides contained in the mixture, it unfortunately happens that albuminate of silver will also be thrown down, and so vitiate the result.

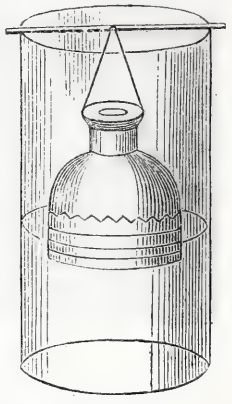
If, on the other hand, a known and measured quantity be evaporated to dryness and calcined, with the object of carbonising the organic matter and afterwards weighing the chlorides which remain, failure again is the result if (as is generally the case) the mixture contain chloride of ammonium; for this salt is volatile at the temperature which would be necessary to effect the complete oxidation of the carbonised albumen.

Under these circumstances it is proposed that photographers should avail themselves of Professor Graham's new discovery,

* Concluded from page 145.

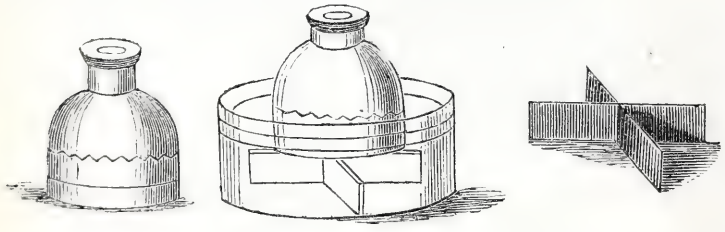
and dialyse their albuminous liquors. The process is especially applicable to this purpose, since it has been ascertained that albumen is nearly the most feebly diffusive substance, while chloride of sodium is one of the most easily diffusible ones.

In conducting the experiment, however, the writer would urge the importance of divesting the mind of the idea of filtration. Dialysation is not filtration: it is a kind of transfusion or exosmosis; though as endosmosis goes on at the same time, it may perhaps be more correctly termed acmosis.



The difference between the operations of filtration and dialysis will become, perhaps, more obvious after a consideration of the following facts:—It not unfrequently happens, in medico-legal inquiries, that it becomes necessary to separate such substances as mineral and organic poisons, like arsenious acid, metallic salts, strychnine, morphia, &c., from the contents of the stomach and intestines, where they may be probably mixed with such matters as milk, porter, egg-albumen, gum, jelly, blood, &c.; and there are few chemists who have had this operation to perform who are not very sensible of the difficulties attending it, if it be attempted to accomplish it by the ordinary process of filtration. Since the completion of the valuable researches of Professor Graham the separation of these substances may be effected with perfect ease.

Sketches of the Bulb Dialyser employed by Professor Graham, and copied from the *Philosophical Transactions* for 1861, are appended for the guidance of those who may desire to test the value of the suggestion now put forward. For their further aid, also, one or two precautions should be mentioned.



1. Whichever form of dialyser be employed, care should always be taken to have a great disproportion between the water in the dialyser and the water in the outer vessel. Graham recommends from five to ten times the quantity. The rule is, that the wider the dialyser and the greater the quantity of distilled water used in the outer vessel, the more rapid and effective is the diffusion.

2. *Hot* distilled water will be found more effective than *cold* for the purpose of softening the parchment-paper previous to stretching it over the hoop; it has the effect of bringing it more completely into the colloidal condition.

The method of operating which the writer would suggest is as follows:—Two ounces of the albumen to be examined should be diluted with an equal bulk of water, and poured into a 6-inch dialyser, which should then be placed in the flat glass dish or basin, with the bulk of water as described,—*i. e.* five to ten times the quantity, say two pints—and set aside for twenty-four hours. At the end of this time the diffusion may be regarded as sufficiently complete to yield a result approximating to the truth.

The diffusate being collected and evaporated to the bulk of, say 10 ounces, should be acidified with nitric acid (this should cause but a very slight turbidity, arising from the action of the nitric acid on the *trace* of albumen, which has diffused), the liquor may now be filtered, and the filter being washed with distilled water in order to ensure the collection of the whole of the soluble salts; solution of nitrate of silver should be added until it ceases to produce a precipitate. This point may be best ascertained by performing the operation in a glass flask, which may be heated in order to aid the agglomeration of the precipitated chloride. When the reaction is completed, two circular filters, accurately counterpoising each other, should be folded one in the other, placed in a funnel, and the precipitated chloride collected thereon. This precipitate being well washed and dried, together with the two filters which have passed through the same treatment, the outer filter is separated and placed in the scale pan with the weights, while the other filter is weighed with its adhering chloride of silver. In this way greater accuracy is attainable than if one filter be used and the chloride scraped off—an operation not easy to perform effectively. The weight of chloride of silver yielded by the dialysis of two ounces of albumen being ascertained, the proportion of chloride of ammonium or chloride of sodium present becomes a simple calculation, based upon the following facts:—

144 grains chloride of silver	=	36 grains of chlorine.
36 „ chlorine	=	50 „ chloride ammonium.
36 „ chlorine	=	60 „ chloride sodium.

A rule of three sum will enable the experimenter to ascertain by means of these facts the number of grains per ounce of soluble chlorides in his albumen at any stage of the process of albumenising.

PLACES OF PHOTOGRAPHIC INTEREST IN YORKSHIRE.*

By C. Butterfield.

BOLTON BRIDGE.

Who has not been to Bolton Bridge—my theme for this evening? I should like to see the man—at least if he is a Yorkshireman, not a Hottentot—and has the full complement of eyes and limbs. Whether the subject be trite or not, Bolton Bridge must be "sung," and I will fulfil the task to the best of my ability. You will not complain, provided always I use my best endeavours to convey information. Any amusement that may squeeze in, like little boys in a crowd between the legs of the big ones, will doubtless act like jam to powders, and help you to swallow the other.

Bolton Bridge! What recollections of nights of preparation and days of pleasure these words bring before me!—chequered, alas! as all out-door pleasures in England must be occasionally, by remembrances of mornings giving fair promise and ending in rain and disappointment. But, then, rain falls everywhere sometimes, except in Paradise: so Bolton Bridge may be pardoned. Pic-nic parties and photographers are very apt to growl at rain; but they should both remember that showers rhyme to flowers, and they can't in reason expect one without the other.

Your first real entrance into Bolton, whether you come from Skipton, Harrogate, or Addingham, you may consider as taking place at the bridge itself; and, to mark the fact, the Commissioners of Roads have kindly placed a toll-bar ingeniously situated so as to catch you whichever way you come—of course more for your guidance than for the paltry pence. (I should like to know what the summer's receipts are at that bar!) Here, then, is the bridge from which the village takes its name. Every photographer looks at the arch and wishes he could take a picture of it—the river (the Wharfe) seems to flow so nicely underneath! It cannot be done, however. Taste revolts at its stiff outline, look which way you will.

Supposing you to have started early in the morning you will, no doubt, be hungry; or, if not, you can "do with a glass of bitter." Well, if you are disposed to be lofty in your ideas and prefer a hotel to an inn, you will remain on the west side of the river: if, on the contrary, you are a sensible man and alone, or with a male friend or two only, you will cross the bridge to the east side and find yourself approaching a long, low whitewashed building, yclept the "Red Lion." Whatever kind of a beast that may be, you will find nothing beastly inside. The rooms are low, certainly, and old-fashioned—can such a thing exist as a real inn new-fashioned?—but the glimpses you get of juicy Yorkshire hams and baskets of freshly-laid eggs swinging here and there from the dark oak rafters, will lighten them up wonderfully; and, if you are partial to being waited on by a neat, blooming, country girl, instead of a whey-faced man, garnished with a white napkin, your good taste will be gratified.

After your breakfast, or "bitter," or what not, light your pipe—mind I said pipe, not cigar: no right-minded photographer of pedestrian intentions ever brings cigars with him—light your pipe: walk through the passage: if you are tall, stoop or your head and a particularly low beam will become introduced to each other. At the end of the passage is a door always open, and going through you will find a smooth level of green turf: call it a garden if you will—it has the charm of one, though I can hardly tell whence the charm comes, as it is mostly turf, unless the pleasure arises from the purely rural look of everything around, and that freshness and beauty so grateful to a town dweller. A few minutes rest here, then fetch your apparatus, pass through the wicket in the garden wall and into the fields beyond: keep along the course of the river for some distance, and, on rising a somewhat steep but short ascent, you will find a seat just where you want it, which you can sit down upon and recover your breath, if you have lost it, and meanwhile look at the prospect beneath you. You are sure to photograph it—for the stereoscope at least; and very nice it looks. Beneath your feet and flowing towards you lies the river, at a little distance a line of stepping-stones strung across it: by the way, when I was there last one of the steps was rather a long one—about three yards—a stone having been washed away. To the left of the stepping-stones stands the old Abbey or, more properly, Priory of Bolton, just in the only place any right-thinking man would have put it—a sort of promontory made by a good-natured bend in the river. Perhaps abbeys were thought of in the creation scheme, and these little places left, just as coals were buried, because they would be wanted. If I am wrong, never mind, the monks knew what was right, and took good care to have it.

We are only looking at the Abbey yet, however; but go down the hill

* Read at a meeting of the Bradford Photographic Society, April 2nd, 1862.

through that short wood, cross the stepping-stones, and mind you don't slip: its not pleasant getting wet and having to go to bed till your clothes dry on such a day as this. Ah! here we are! Now this *is* worth coming for! Who would not be a photographer? But, stay: just sit down on the edge of that mouldering old stone, and let me tell you something about the holy ground you stand on, that you may not run irreverently about, and carry home a box-full of views and no knowledge. Listen while I tell you how Bolton Priory was originally not at Bolton at all, but at Embsay, a village yet lying between Bolton and Skipton.

The Priory was founded in 1120, and transferred to Bolton about thirty years after; because—so says tradition—the grandson of the founder (commonly called the "Boy of Egremont") was drowned at a place shortly to be described called the Strid or Stride. Grief for her only son made his mother a willing listener to the suggestions of the Prior and Canons that Bolton would be a pleasant place, and near the scene of her son's melancholy death. The translation took place, and Bolton Priory was reared up. Century after century passed away, and Prior after Prior enjoyed his days and nights undisturbed; but a time came and also a man who lacked gold, and who looked with greedy eyes on the fair domains of Bolton. The decree went forth; and in 1540 the last Prior, Richard Moone, voluntarily abdicated and resigned his charge into the hands of Henry VIII., first "defender of the faith." Two years afterwards he sold the site, together with three lordships, seven manors, and sundry advowsons, lands, and tenements, for the sum of £2490, to Henry Earl of Cumberland. Our favourite Bolton did not appear to be highly valued then, even allowing for all difference in the value of money.

Now that you have patiently listened while I spoke, rise from your seat and follow me round the old place, keeping your eyes wide open for the best points of view. Is not the churchyard a beautiful spot? A holy quiet rests over it, seeming to impress every one. It is not often you see any so insensible as not to give way to quiet and peaceful thoughts in this place. Even children hush their laughter and speak low, seeming to feel the influence of the past upon them. It appears almost a sacrilege, but there is one view you must take from here, and for which purpose you must introduce your camera amongst the graves of generations passed away. The view I mean is one looking across the river, and having for a background a peculiar scarp on the hill-side, bare of vegetation, and finely contrasting with the rich green of the foliage around: more than this, the contrast is not lost in the photograph.

After giving due time to the Abbey let us take to the road, and, keeping near the river, walk onwards till you see a sweep in the path to the right (mind I don't mean a chimney-sweep), leading to a wooden bridge over the stream. Take my advice, cross this bridge, instead of going the usual way straight forward. You will be well rewarded by the numerous bits of river-side scenery you will meet with: besides, I want you to have the advantage of a convenient place I found for trying the result of your plates (if dry) and learning how the exposure has been. Immediately after crossing the bridge turn to the left over a style; and mind, if there are two paths, always choose the one nearest the river. About half-a-mile or more from the bridge you crossed, you will take, as I told you, the path to the left or nearest the river, and you will directly after feel quite sure you are wrong, as there scarcely seems a road at all, only a projecting ledge of rock. Instead of being quite wrong you are just right, and you will see immediately, in the face of the rock, a low aperture. Now, if you happen to have with you such a thing as an end of wax candle, light it and move onwards into the darkness of the cave—if you choose to call it so. What the place has been I cannot say; but it penetrates under ground about ten yards, and, as there is a bend in its course, you have a natural dark room and a river of clean water at the door. I almost always take the necessary articles and develop one picture there to see that all is right, and I advise you to do the same.

I once met with a very annoying accident near this place. In climbing a crumbling bank I slipped and fell. My prepared plates were encased in a grooved dark box; but the weight of the plates dashed against the lid, forced it open, and let in our great enemy and best friend—light! I instantly covered the mouth of the box with my cap, utterly regardless of contusions received in the fall. All the plates I had were contained in that box, and I was determined to save them, if possible. Luckily, the place was rather dark, and what light there was would not be very actinic, in consequence of the dense foliage around. I found, on reaching home, that my plates were no worse, with the exception of a slight shade at one end, which I had margin enough to be able to cut off.

After ascertaining at this cave that your plates are all right, move forward once more, still keeping near the river, and taking views where your taste leads you. Gradually you will see the river—hitherto a wide stream—growing narrower at every footstep. Flakes of white foam, borne slowly along on the surface, tell of a fierce struggle taking place higher up—a struggle sometimes less savagely contested than at others, but never ceasing. As you approach nearer you hear, borne along by the wind, the sounds of the fight—now low, now swelling higher and higher, till at length emerging from the trees amidst which you have hitherto walked, a clear space opens before you—the arena where, for ages before man's eye rested on the scene, the air has trembled with the sounds now humming in your ears. You are close by the far-famed and fatal Strid. Around, under your feet, on the ground where you stand, are proofs of the mighty power of the waters. Here are no sharp edges—no pointed angles: the rocks within sight are all smooth and rounded—silent witnesses of the awful floods that in the depth of winter tear resistlessly through this then deserted valley. Now you see why this open space—why these numerous water-worn hollows, many of them as regularly circular as if cut by the hand of man. The river, grown too large for the narrow channel through which it now flows, rushes out on to the rocky plain you stand on, and, in its joyous release from thraldom, whirls, plays, and eddies round the rocks, producing by its action the empty hollows you wonder at, and writing down a lesson for future geologists not likely soon to be effaced.

Halt now on the brink of the rushing water. Let us stand here—just where the cleft stream chafes eternally against the dividing rocks. Although now calm, enough remains to show you what that force could do in anger. Boiling and seething like a cauldron your eye is insensibly caught, fascinated, and whirled round in harmony with the eddies below. Gaze not too long: draw back, ere the brain becomes bewildered and giddy, and you are lured down into the death beneath—certain death it is. Often have I amused myself by dropping in sticks, or tightly-corked bottles, and have watched them for a moment before they disappeared and were seen no more, drawn into the caverns underneath where we stand—caverns won from the solid rock in the lapse of centuries. It was here that the "Boy of Egremont" was drowned; and if tradition speaks truth, photographers are indebted to this Strid for the very existence of Bolton Priory.

If you choose—after what I have said—to jump the narrow chasm, well and good: I do not object. I have often and often done it myself, both backwards and forwards, and familiarity breeds contempt. The jump is nothing; but be sure your nerves are steady and your eye true, that you do not slip on landing. If you do——I have done with you, and hand you over to the coroner and jury.

Supposing you to have crossed over safely with your camera, &c., climb up the walk on the opposite side, keeping to the right, and almost at the summit you will find a seat placed to look at a fair vista opened out up the river. In the foreground is a sort of obelisk of stone—natural, not artificial—called, I believe, the "Hawk's Rock;" but I cannot learn the origin of the name. The view is very pretty, and worth taking for the stereoscope.

Walking forward up the river some distance further you will arrive at Barden Tower, a particularly inartistic assemblage of stones and mortar, interesting only in an antiquarian point of view. It was originally a sort of hunting lodge, and, having fallen into decay, an inscription tells us it was rebuilt by the Countess of Pembroke, who was born there, and her work has in turn gone to decay also.

Beyond this tower, up the same side of the river, there is a tributary stream that will well repay a visit, as there are some very pretty falls in the ravine through which the stream runs. Near here, also, are said to be the remains of a village so old that nobody knows anything about it; but it is supposed to have existed some time before the Conqueror, and ages before chimneys were invented, as there is the mark of the fire in the centre of what once was the floor of a hut.

But we will leave Barden and its remains, and crossing over the river by Barden Bridge go back on the other side, that we may, lower down, diverge from our course and visit another celebrity of Bolton, the "Valley of Desolation." There is one road to this which I much prefer, and which seems not much known. Often as I have been there I never yet met any one save a labourer or native of the district. No excursionist or pic-nic parties seem to know of it—no enamoured pair, straying unconsciously from their party, seem to have discovered its recesses. There is little fear here of being disturbed by any well-dressed idlers from Ilkley or Harrogate who have come over for the day, and think, forsooth, a camera is *infra dig.*, and you lose caste by being seen photographing; but we can afford to laugh at such puerilities. When their day's so-called pleasure is over, and ours, also, has come to a close, who is to be envied? He who arrives at home jaded by his purposeless sauntering? or he who feels his nerves braced by healthy exercise and natural excitement, and who, moreover, is looking forward anxiously to a further reward in the plates his magic box contains?

But to return. The road I speak of will be easily found by attending to what I say. After passing the Strid in returning towards the Abbey—travelling by the wide road, not the footpath—you will have to cross a stone single-arch bridge over a tributary rivulet. Just before crossing it—on the side nearest Barden—you will see on the left hand, half hidden by overhanging bushes, a narrow path: this path leads direct to the Valley of Desolation, and some of the most beautiful vistas in Bolton are to be found on the route. The path winds high up on the sides of a deep ravine clothed from base to summit by the freshest and greenest foliage. The brook below affords some magnificent little bits of wild scenery; but they are difficult to take:—a long exposure and iron developer are needed to bring out the beautiful foreground details. Grand ferns arch their graceful fronds over the stream, while dark rocks frown out from the sides—every nook and crevice being held in possession by some wild plant luxuriant in its damp solitude. It is a treat to a lover of nature to know of this spot. He cannot but be gratified by its solitude and calmness, only heightened, not disturbed, by the soothing perpetual hum of the stream below. Of the Valley of Desolation itself little can be said save that it is the one green place in the midst of what seems more like a world in a state of preparation than anything else. All around, except just in this valley and the road we have come, nothing meets the eye in the immediate neighbourhood but a bare and blasted expanse of country, apparently producing nothing but stones and sheep. As if to heighten

the effect, a scathed and blackened trunk, riven and dashed to earth to moulder and decay in some wild winter's storm, stands bleak and solitary—a witness to the power that destroyed it.

At the upper end of the valley, facing a pretty waterfall, a summer-house has been built—a quiet place enough *in* summer, but the rustic bridge spanning the stream is held in its place by strong iron chains, telling the silent tale of many a lonely struggle with that element now so gentle and playful, seeming as though a child's hand might divert its course.

Leaving behind us this out-of-the-way place, let us come once more into the beaten track. Unless pedestrianism be a habit with you, and your limbs have by use become inured to a day's continuous exertion, you will not now be sorry that each pace shortens the distance between yourself and your inn. Again you cross the wooden bridge—again pass the grey mouldering walls of the old Priory, looking all the more soft under the rays of the westering sun. You give a glance towards it, but your thoughts are bent on other things. Visions of warm preparations of the suspended hams and eggs you saw this morning flit before your mind's eye, and disturb that equanimity and calmness which the contemplation of such scenes requires. Nearer and nearer looks *the* bridge, *par excellence;* and, nestling on one side, you see the long low roof of your much-longed-for resting-place. Amongst the smoke of its chimneys, which, think you, is the one surmounting the vast arch of the old kitchen fireplace? I warrant there is something there just now more interesting than all the priories in England! It is sad to acknowledge it, but one's perceptions of the sublime and the beautiful are sadly weakened by a fasting stomach.

After washing and making yourself comfortable, and having disposed of the viands laid before you, take your pipe and stroll into the garden I described this morning. If you are wise you will not return home to-night, but, after your calm quiet evening is passed, you will retire to rest in the cleanest bed and most old-fashioned bedroom conceivable. There you will find that sweet repose to be earned only by a day of exercise and occupation. Do not commit the enormity of developing any of your plates in the bedroom. Nothing has brought our art into bad report amongst landladies more than this dirty practice. Wait till you get home. Mind, however, that you are up with the lark tomorrow morning; and, before the sun has fairly left the eastern shore and started on his voyage westward, go out into the clear morning air (I will allow you a cigar now, if you like), stroll onward to the Abbey again, and, in solitude and undisturbed, ponder over the days gone by, ere Henry's desecrating hand levelled the greater part of the fair fane above you. In this you will want no help from me, nor would a companion be desirable. Farewell, therefore. My task is ended. We may some day meet again, and once more wander in fancy amid the shady paths and quiet scenes of Bolton.

Exhibition Gossip.

ABOUT £ s. d.—THE GRACIOUSLY CONCEDED "SEPARATE APARTMENT"—THE CONTRIBUTIONS AND THE JURORS.

THOSE to whose labour, thought, emulative energy, capital, patriotism, and skill the success, nay the very existence, of this vast exposition of the world's art, science, and industry is due, are *to pay for their admission tickets*, or to be excluded from the building! So say those miracles of sagacious wisdom the Royal Commissioners. Of a verity great are they at turning a penny! How deftly they clutch every little chance which may be converted into a source of pecuniary profit! An enterprising tradesman offers to provide cases for the season tickets gratuitously, in return for the privilege of puffing his wares thereon; and, eagerly availing themselves thereof, these very Royal Commissioners instantly issue a public announcement stating that such cases may be procured at their shop—I mean their "*office*"—for the low charge of one shilling each! An exclusive right to photograph portraits somewhere within or just without the building having been created, this also is put up for sale in order to secure "a valuable consideration."* And then, again, in that very suspicious-looking sole right to photograph the objects assembled within the building (just purchased by the London Stereoscopic Company at the eleventh hour), not content with enforcing terms universally condemned as meaninglessly absurd and unjust, they must needs—cunning bargain-drivers that they are—stipulate for being themselves provided with a few copies from each negative free of charge! Of this scheme *The Times* pointedly said:—"If in the tenders for refreshments the contractor was called upon to specify how many free dinner tickets each day would be placed at the disposal of the Commissioners 'for distribution, but not for sale,' the public, we think, would express their opinion very freely upon the nature of such an agreement; and we confess we are at a loss to see the difference in principle between such an agreement and that which the Commissioners expect to make with the photographers."

* The *Art Journal* says the Commissioners "are not likely to get much from this source. People will have too much to see and do to sit for their portraits; and of course there must be an extra charge, to enable the artist to pay the Royal Commissioners."

Quite agreeing with *The Times*, I cannot feel at all sure that the Commissioners—they are *such* cunning fellows!—have not really made some similar economical arrangement as that hinted at for saving their individual larders during the season. However this is all settled now, and the Stereoscopic Company are busy with their preparations for photographing the opening ceremony. All success to their efforts! The subject is indeed a grand one! But this display of huckster spirit in the Commissioners—however creditable to or in accordance with a dealer in smallwares—is hardly the right thing in so high and eminent a quarter. One might easily imagine the whole of this mighty affair to be neither more nor less than a monster dodge of Barnum's rather than the glorious effort of a great, wealthy, and generous nation—a cunningly-devised pretext for scraping together a little ready money rather than a mighty scheme for the spreading of peace, prosperity, and kindly feeling among all the peoples of the earth. These Royal Commissioners almost make one think well of the Frenchman's sneer, and believe that we really are the nation of shopkeepers he said we were. There is one rather pleasant thing, though, in such sordid, ignoble hucksterings; for there is some consolation for photographers in knowing that those who have so publicly degraded their art in its classification are not more scrupulous in as publicly degrading themselves, their own high office, and the country to which they belong.

And now let us turn and look at this graciously conceded "separate apartment," for which a little time since battle was so stoutly done. The very loftiest position they could accord any art the Commissioners have conceded to photography; and who can say of this art *now* that it is not high art—attic art—when it is located in the garret? You have to ascend seventy odd steps before you reach British photography's hard won "separate apartment," and it strikes me, from the inefficient arrangements made for its ventilation, that when, in the dog-days, you get into this "separate apartment," you will not be sorry to escape out of it again into the lower, better ventilated, and less exposed portions of the building. It is a large, lofty gallery, the larger portion of which is occupied by the educational department; it is well lighted, but—unfortunately for M. Joubert, who will in consequence have no small difficulty in exhibiting his burnt-in transparencies—is entirely so lighted from the top; and it contains the works of that huge advertising clock surmounting the central entrance. Speaking of this clock, by-the-bye, photographers are not perhaps aware that the extended period awarded them for sending in their productions was due, not to the kindly considered delay suffered by them from the protraction of the dispute about the classification, and the consequent shortness of the time in which they had to get ready their works, but to the fact of a hole having to be made in the wall for the accommodation of the works of this clock (which saved the expense of the more classic and artistic adornment originally intended for its place), and to the packing-cases of the exhibitors being in the way of the workmen. British photography, then, stowed away at the top of interminable flights of stairs, in an ill-ventilated, hot gallery, will, as we may safely conclude, only be visited by those specially interested in its productions; while foreign photography, occupying positions in which it cannot possibly be overlooked, will reap the lion's share of the valuable privileges and advantages of the Exhibition. This is in accordance with the justice and prudence which has also given foreign painters most important advantages over their English brethren, and chosen a foreign leader for the musical display of the opening. Now all this ought to prove, even more conclusively than ever, how important to the interests of British photography it is that the art should be well represented in one or two additional photographic exhibitions during this most rare occasion. It is earnestly to be hoped that at the Crystal Palace Exhibition, or at that projected by the Central Society, we may retrieve that which we shall certainly lose at the International.

We now come to gossip about how this "separate apartment" at the top of the big house is likely to be filled. I fear you will say that it might have been better filled; and that as it is filled it will not carry off the palm from its rivals down stairs in the parlours, nor show too much advantage in contrast with its superiors in the drawing-room. I most earnestly hope that I may be disappointed in this foreboding thought; and, indeed, I may be prejudiced unwittingly, for am I not one of that great army of disappointed would-be exhibitors, who hunted for their attractive models, laboured to secure their good negatives, and studied to make their artistic pictures only for the bitterness of a refusal from the appointed Committee. I hope I shall find no worse pictures than my own there, and then I, and doubtless my copartners in distress

also, will have found ample consolation. The hanging is, while I write, rapidly proceeding. Many old favourites will re-appear: this is already apparent. Vernon Heath, Mudd, Wardley, Breese, Sidebotham, Lieut.-Col. Stuart Wortley, Lyndon Smyth, Dixon Piper, and others, will represent landscape art with their best efforts. Rejlander and Robinson will be the chief representatives of what we term "composition" photography, and it will suffer nothing in such hands. Claudet, Owen Angel, Smith and Blanchard, and others, will represent the solar camera branch; but the dull dark weather, of which we have had so tedious a continuation, has evidently exercised a serious influence upon the display of these novelties, and some, I know, have had to fill their allotted space with productions some distance below the standard which a little preliminary bright weather would have enabled them to attain. As other countries will exhibit solar-camera pictures obtained under far more favourable circumstances, this should be remembered. In connexion with these enlarged pictures, I may mention that space had been secured by Mr. F. Hart for the exhibition of an improved solar camera, for which he has obtained, or is about to obtain, a patent, and which was also to be illustrated by some of its productions; but I am not sure whether Mr. Hart has got his preparations completed in time for securing their admission. Those who have heard much of Mr. Breese's instantaneous photographs will be glad to hear that this gentleman exhibits two tables of the stereographs so admired and wondered at in the Birmingham Exhibition. More of the pictures, however, anon.

And now we see before us the men in whose judgment photographers have most faith, by whom they desire their productions should be judged, and their relative degrees of merit stamped as sterling, genuine coin—I mean the Jurors, elected, as M. Claudet asserts in a contemporary, because recommended by at least "a considerable number of exhibitors." Doubtless your imagination conjures up the names of those who in past and similar offices have best fulfilled such or similar duties; or possibly you may seek their names in those which have been most familiar in the pages of our journals as earnest strivers and workers for the honour and advancement of the art; or you may, perhaps, seek them in the most able and accomplished of our practical photographers. Well, here are their names, and I leave you to judge why and how they have been elected:—First, A. Claudet—I could not have suggested a better name; next, Professor Tyndall—for the scientific branches, a good man and true; thirdly, Thurston Thompson, certainly a very talented photographer; and lastly, his pupil, Lord H. G. Lennox, of whom, save as an occasional exhibitor, I know as much as I did of another nobleman, the policy of whose election I had the temerity to question in connexion with the Committee for the Photographic Department. As, however, in the eyes of some of us titles of nobility are sacred things, not to be lightly named by undistinguished sons of "common people," I had better quit this subject, perhaps.

So far, mine has not been a genial nor a cheery task. I could not admire the building, to which my first gossip was devoted; I did not feel altogether amiable towards the Commissioners in dwelling upon the classification question in my second gossip; and for this, my third, the subjects are not better calculated to produce a contented, good-natured, condition of the photographic mind. But I know there are brighter days coming, when you and I, my dear reader, shall dwell upon the beauties of nature as translated by art, and trace in productions from the cameras of every land the sure and certain signs of photography's future powers in art, science, and industry.—A. H. W.

Suggestion to Photographers.—In The *Scientific American* we find the following:—"A radical defect in nearly all likenesses taken by the new method now in use, arises from the fact that the sitter being in a novel situation unconsciously assumes a constrained and unnatural expression of countenance, and having no means of correcting this, it is, of course, repeated in the picture: hence so few sitters are entirely satisfied with their photographs. The improvement we suggest is designed to obviate this defect, by attaching to the camera an ordinary plane mirror, so adjusted that the sitter, instead of staring into blank space with a feeling of what a ridiculous part he is playing, shall look at his own reflection in this glass during the entire operation. He will thus be enabled at once to assume and retain his ordinary expression of countenance, or take any other that best pleases himself. The picture will be an exact reproduction of the image in the mirror, and cannot fail of being perfect in every respect."

Meetings of Societies.

MEETINGS IN MAY.

1st.—Glasgow.
2nd.—Newcastle-on-Tyne.
6th.—London, and Liverpool.
7th.—Manchester, Edinburgh, and Bradford.
8th.—Chorlton, and S. London.
13th.—Photo. Soc. of Scotland (Ann.), and Birmingham.
21st.—North London, and Edinburgh.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

An ordinary meeting of this Society took place at Middleton-Hall, Islington, on Wednesday evening, the 15th ult. George Dawson, Esq., V. P., occupied the chair.

The minutes of the previous meeting were read and confirmed.

Mr. R. W. H. Smart, of Chiswick, was elected a member of the Society.

The Chairman called on Mr. John Bockett to read his paper *On Photo-Micrography*. [See page 162.]

The meeting listened with great interest to Mr. Bockett's communication, which was appropriately illustrated by the exhibition of the apparatus used by that gentleman (a drawing of which is appended at page 163, where the arrangement is described), and also by a numerous collection of very successful photo-micrographs obtained in the instrument.

The Chairman having invited discussion on the subject of Mr. Bockett's communication,

Mr. Shadbolt expressed the great gratification afforded to him by the paper which had just been read having been brought forward, bearing as it did on matters of great interest and high importance to scientific men. He thought Mr. Bockett had done well to exhibit the apparatus by which he had accomplished satisfactory results. In reference to these he might remark that he considered the photographs of *palates of the slug* and other molluses very good: the *Heliopelta*, and the *Isthmia nervosa* were also good, but remarked that photographs, however good, could not do more than faintly indicate the forms without approaching to the brilliant frosted-silver-like texture of those interesting organic bodies. He had one or two suggestions to offer in connexion with the matter in hand; and, as Mr. Bockett had expressed a desire to be regarded as one equally desirous to receive and impart information, he felt assured he should not be out of place in stating these suggestions to the meeting. *First*, in reference to focussing:—A difficulty was always experienced in getting the focus of the object-glass actually upon the surface of the screen, as the image was visible through the ground-glass, even if not quite in contact with its surface. Gentlemen present would remember that M. Claudet had announced this fact some time since, and he (Mr. Shadbolt) would therefore recommend the use of a Ramsden's eye-piece for the purpose of focussing, it being so constructed as to preclude the possibility of error in that part of the operation. Accuracy, he might further explain, was secured by the application of a clamping screw, so that the eye-piece being once adjusted for any given thickness of focussing-glass, it became thenceforth impossible to get definition in the detail of any image which was not brought to a true focus on that glass. *Secondly*, in reference to sunlight:—Many amateurs had employed the direct solar rays in photographing microscopic objects. He believed Mr. Delves was the first, and he had been followed by Mr. Wenham, and others, and by this means instantaneous pictures were taken in many instances. Diffused daylight was, of course, used in focussing; and the exposure was so quick, by merely turning the mirror to the sun, that no damage occurred to the object. It would have come within the experience of those who have practised this branch of the photographic art to observe that such objects as parasites, animal tissues, &c., were seldom well rendered. In the photograph of the tongue of the blow-fly, then before the meeting, it could be noticed that the detail was wanting. The principal beauty of the object consisted in some spiral vessels near the surface. Those were not rendered, neither were the tracheal vessels; and this not because they were out of focus, but the yellow character of the investing membranes had produced the effect of under-exposure. Those were defects in the process which members would perhaps say it was useless to mention unless a remedy were proposed. He was glad, therefore, to be able to indicate what would probably overcome the difficulty. It had been suggested that polarised light should be employed for that purpose, so as to throw upon the object highly actinic rays, with the view of neutralising the non-actinic effect of the yellow membranes. That, however, would be a mistake, as no amount of actinic light thrown upon a yellow object would make *it* more actinic in its effect on a sensitive surface, since its antagonism (so to speak) to actinic rays, consisted in the power which it possessed of absorbing those rays. Notwithstanding all this however, he (Mr. Shadbolt) was of opinion that the difficulty might be overcome by introducing something to degrade the light, and thereby lengthen the exposure so as to admit of the production of minute details in the object without getting the effect of over-exposure in the surrounding light. He would suggest for that purpose a piece of yellow glass, and thought that polarised light when applied might have a similar action. In the third place he (Mr. Shadbolt) had only to observe, in reference to the arrangement of Mr. Bockett's apparatus, that he thought the tube too

small, and, as a substitute, he would recommend the use of a larger tube or a conical box attached to the camera, and either of those should be lined with black velvet, to prevent reflection.

Mr. Bockett explained that the microscope he had applied to the purpose was one which he regarded as a hack, and he was therefore sensible that the arrangement of apparatus of which it formed a part admitted of considerable improvement. He agreed with the suggestion made by Mr. Shadbolt.

Mr. Garnham thought it would be better to take away the tube of the microscope altogether, and adapt the object-glass at once to a tube of much larger diameter. He could not see that that alteration would increase the difficulty of obtaining the focus.

A variety of observations were made as to the relative advantages of large and small tubes, and the probability of light being reflected from the sides, unless suitable precautions were adopted, when

Mr. Burr reminded the meeting that one object aimed at in Mr. Bockett's arrangement was the use of the apparatus already in the possession of an amateur with the least possible addition to the expense.

Mr. Ross intimated that the collimation of the instrument was all that could be desired.

It was stated by Mr. Shadbolt that the difficulty of reflected light inside the tubes might be overcome by pasting a piece of black velvet on to a piece of brown paper, and then coiling both up until they fitted the tube.

The Chairman thought the conical box in front of the camera the best, as it was obvious, from the size of the image on the ground-glass, that some of the rays must strike against the sides of the tube.

Mr. Bockett suggested that if the apparatus were much increased in length the means of adjusting the focus would be beyond reach, and that would, therefore, have to be accomplished by some other and special arrangement.

In reply to a question from Mr. Bockett,

Mr. Shadbolt said he would not put a lens behind the object-glass: he would explain the arrangement he thought best. Mr. Delves found that by moving the camera one-eighth of an inch back he was enabled to make the required allowance for the over-correction in ordinary microscopic objectives. He (Mr. Shadbolt) had experimented with some of the parasites of the water-rat, mounted in glycerine and water, the object having an appreciable thickness; by focussing for the surface nearest to the objective, he found on taking a photograph that he obtained an image of the further surface, and on measuring the variation, by means of the fine adjustment of the microscope, he found that in order to compensate the actinic variation of a $\frac{3}{8}$-inch object-glass, it was needful to withdraw it the one-fiftieth part of an inch further from the object after focussing, in consequence of the over-correction. He (Mr. Shadbolt) would take this opportunity of showing the members a daguerreotype of a microscopic object taken by Mr. Hodgson in the year 1841. It was a very perfect representation of a section of endogenous wood. He described Mr. Hodgson's arrangement to have been a vertical camera, with a microscope objective, the object being illuminated by aid of a concave mirror.

The daguerreotype was examined with much interest by the members.

Mr. Bockett remembered to have seen at one of the Exhibitions of the Photographic Society a daguerreotype copy of the proboscis of a blow fly, in which the ramifications of the spiral vessels were very delicately and accurately rendered. This had been taken through the eye-piece of the microscope.

Mr. Ross mentioned that Mr. Kingsley used very powerful condensers in taking his photographs of microscopic objects, and when such was the case instantaneous exposure was necessary to prevent the object from being burnt up when direct sunlight was used.

The Chairman, speaking in reference to the collodion used by Mr. Bockett, presumed it was of a structureless character; but he did not think that the method suggested in the paper just read was the best means of attaining the object aimed at. If it were desired to attain a really structureless collodion, it was necessary to operate in the preparation of the pyroxyline upon a mixture of acids, at a temperature not lower than 100° F, and so weak that two-thirds of the cotton became dissolved in the acids. If then the undissolved cotton, after copious washing, be dissolved in a mixture of five parts of absolute alcohol and three parts of ether, a collodion would be obtained perfectly free from structure, capable of carrying a large amount of iodides, whereby its sensibility would be much increased, and adhering so tenaciously to the plate that it might be washed with great violence under a tap. He (the Chairman) thought the iodides of cadmium and ammonium the best to be used for that purpose, and he had found them bear any amount of intensifying.

Mr. Shadbolt wished to protest against the opinion advanced by the Chairman in reference to the supposed structural character of a mixture of Ponting's and Thomas's collodion. He thought the question of structure one not so immediately dependent on the character of the collodion as was generally supposed, but rather on the kind of manipulation to which it was submitted. It was quite easy to produce evidence of structure even in a structureless collodion; the presence or absence, in fact, of the character under consideration depending as much on the length of time given for the film to set after coating, as on the proportion and strength of the alcohol and ether in the collodion.

The Chairman reiterated his opinion that the structural or structureless character of the collodion depended entirely on the kind of pyroxyline used, regardless of the proportions of alcohol and ether.

Mr. Shadbolt said he admitted that it was an advantage to have a collodion yielding a film certainly free from structure, but it was also advantageous to know how to get rid of it when it did occur.

The discussion on this subject having been brought to a close,

The Chairman announced that Mr. Moens had presented to the Society's portfolio five photographs of Eastern scenery. Mr. Bockett had also presented a collection of photographs of microscopic objects to the Society.

Votes of thanks were accorded to each of those gentlemen.

A short discussion then ensued on the subject of a photograph of Whippingham Church, introduced by Mr. Shadbolt to the notice of the members for the purpose of verifying some remarks which he (Mr. Shadbolt) proposed to bring under the notice of the members at a subsequent meeting of the Society if opportunity served, and, if not, in the pages of The British Journal of Photography.

The meeting was then adjourned.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on Wednesday, the 2nd ult.,—John Parry, Esq., Vice-President, in the chair.

Mr. Wardley exhibited a camera, by Dallmeyer, fitted with four lenses, for *carte de visite* pictures. An arrangement in this camera for instantaneous exposure, and in which the closing was brought into action by the elasticity of India-rubber bands, was much admired, and the general workmanship commended.

Mr. Mabley read a paper *On the Expenditure of Silver used in Photographic Operations, and on the Saving that may be Effected.* [See page 164.]

A short discussion followed the reading of Mr. Mabley's paper.

Mr. Wardley agreed with the statement that it was very difficult to wash the prints free from nitrate of silver, especially in cold weather. He had also observed that if hot water were used before the application of cold water, the prints were liable to become brown. The waste developing solutions he poured into a separate vessel, and the reduction took place without any addition. He thought it would be a great advantage to photographers if jars of considerable capacity could be procured—of a similar shape to the old precipitating glasses, of a greater diameter at the bottom than at the top.

Mr. Noton exhibited *A New "Fine Adjustment" Motion Applied to Common Rigid Cameras*, and read a description. [See page 169.]

Mr. Parry read a letter from Mr. Sidebotham, enclosing a panoramic picture which he had received from Mr. Penny, of Cheltenham, who begged him to mention to the meeting that he had published, long since, the principle of obtaining views of this character by turning the lens upon an axis. This picture and its rival from Batavia, shown at the March meeting, were compared: both were pronounced to be excellent, but to the latter was awarded the highest praise.

The Chairman stated that since the previous meeting he had tried several experiments with panoramic pictures, but found the task more difficult than he had expected. He then explained the plan he had adopted, having erected the camera with which the experiments were performed. The centre of motion was placed under the plane of the ground-glass, and adjustable stops were provided, so as to ensure the double exposure according to the focussing.

The Secretary exhibited a series of instantaneous pictures which Mr. Pyne had forwarded. They were taken by a professional photographer, upon Dr. Hill Norris's dry plates, and it was unanimously agreed that they were a great success.

The proceedings terminated with votes of thanks to the Chairman and to the gentlemen who had provided matter for the meeting.

CHORLTON PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on Thursday, the 10th ult.,—Mr. W. Griffiths, V. P., in the chair.

The minutes of the previous meeting were confirmed, and the Chairman requested the Secretary to read the

Annual Report.

In submitting the Report of the past year, the Council refer with pleasure to the satisfactory financial position of the Society, the Treasurer's accounts showing a small balance in hand.

It is not proposed to dwell on the proceedings of the year any further than to direct attention to the fact that the meetings have been well attended, and more animated and instructive than the paucity of papers read would lead the members generally to suppose, and to the more important fact that the dry process *par excellence* is yet undiscovered—or, if discovered, unpublished. Several suggestions have been put forth during the year towards the accomplishment of this really coveted end; but, so far, complete success is not attained. The Council would urge upon every member having the necessary time and opportunity the absolute necessity of making repeated and energetic efforts in this direction. Photographers should not cease in their efforts until a process is in their hands that unites in itself simplicity of manipulation with something approaching to certainty of success, combined with the maximum sensibility that it is possible to obtain in conjunction with good keeping qualities. This, in the opinion of your Council, is one of the photographic problems of the day, but the solution of which requires either considerable knowledge and tact in experiment or rare good fortune in accidental discovery.

A reference to the minutes of the Society will show that you have given some time to the consideration of dry processes, and will also prove that facts that were previously unknown to many of you have been elicited. These, of course, have been fully appreciated, and are matter for congratulation.

A summary of the year's proceedings is given as required by rule 3.

June 13, 1861.—The President delivered an inaugural address, in which he dilated on the objects and advantages of photographic societies. The address was followed by a lively discussion on alkaline gold toning.

September 12.—The first meeting after the summer vacation was opened with a consideration of the question raised by Her Majesty's Commissioners in reference to Photography and the Great Exhibition of 1862, when you protested against the proposed scheme. Mr. Wardley then read a paper *On the Taupenôt Process.*

October 10.—The discussion on Mr. Wardley's paper was continued.

November 14.—The Chairman (Mr. Griffiths) proposed a discussion on wet and dry processes, which was carried on with great vigour.

December 12.—Mr. Wardley replied to some remarks made by the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, in which he described some interesting experiments. Mr. Griffiths also detailed experiments of a very instructive character.

January 9.—Discussion on the wet and dry processes continued.

February 12.—Discussion on dry collodion processes introduced with much detail by Mr. Griffiths.

March 13.—Society's private business.

The Council, in concluding their Report, feel it to be only just to the Editor and also to the Publisher of THE BRITISH JOURNAL OF PHOTOGRAPHY to record their sense of the unvarying kindness and courtesy with which they have always been met in their business with those gentlemen.

The Report having been adopted, the members proceeded to elect officers for the ensuing year.

President—Mr. JOHN HEYWOOD.

Vice-President—Mr. WM. GRIFFITHS.

Secretary and Treasurer—Mr. C. ADIN.

Council—Messrs. W. HOOPER, L. E. WHAITE, W. RADCLIFFE, JOHN FAWCETT, and J. ROGERSON.

The business of the meeting having been disposed of, the usual vote of thanks was passed to the Chairman, and the members adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THIS Society met on Wednesday evening, the 16th ult., when the chair was occupied by George H. Slight, Esq., Vice-President.

William Johnston, Esq., was admitted a member; after which, Mr. J. T. Taylor introduced—in the following remarks—

The Invention of the Stereoscope, and the Chimenti Drawings.

As this, at present, is a "sensation" subject in scientific circles, I thought it well to bring it before the notice of the Society. The subject is somewhat complicated, and, from the position of the gentlemen involved in it, of considerable interest. On the one hand is Sir David Brewster, the honoured President of the sister Photographic Society in this city; and on the other, Dr. Carpenter, with whose writings many of you are doubtless familiar.

With respect to the invention of the stereoscope the following appears to be the case pretty fairly put:—Sir David Brewster claims that the lenticular or ordinary refracting stereoscope is his invention, and that he published this invention in 1849, previous to which time no similar instrument was in existence. This Dr. Carpenter meets by stating that another instrument for showing similar effects, and of which the alleged invention of Sir David Brewster was only a modification, was invented and published to the world by Professor Wheatstone, in 1838, or eleven years previously. It is also stated by Dr. Carpenter that a prismatic refracting stereoscope, or one similar to that invented by Sir David Brewster, was constructed by Professor Wheatstone in 1832, or seventeen years before Sir David Brewster's invention, although the same was not published till twenty years after. There is no doubt whatever that the popular stereoscope of the present day, by whomsoever invented, is the lenticular or prismatic or refracting one. The next question is, does this particular class of stereoscope bear such a relation to the other, or reflecting, stereoscope (the priority of discovery of which is not called in question) as to be considered a modification arising out of, or suggested by it? or is it quite a distinct instrument? If the latter, as in science, priority can only be rightfully awarded to him who first publishes; and Sir David Brewster having published in 1849, he has clearly an advantage over Professor Wheatstone by three years.

This I conceive to be, in the fewest possible words, a fair statement of the question at issue. Sir David Brewster claims, not the invention of *the* stereoscope, but of the *refracting* stereoscope.

With respect to Chimenti's drawings, Sir David Brewster states that they are so drawn as to combine and give the effect of relief; and this is met by Dr. Carpenter, who states that they do not possess stereoscopic relief, but that if they did it does not follow that they were drawn with a knowledge of stereoscopic principles. These drawings have been submitted to many gentlemen competent to judge, who say they are *not* stereoscopic; but they have also been submitted to many gentlemen equally competent to judge, who say they *are* stereoscopic. Indeed, one of the best stereoscopic photographers in Scotland told me that he was inclined to believe that the person or persons who made the drawings must have done so in perfect knowledge of the effects to be produced by coalescing the pictures, and that it could *not* have been done by a mere haphazard dissimilarity in the drawings. On the other hand, another gentleman, who is very well qualified to judge of such matters, says that the one on the left is the rough, ready, and rapid sketch of a master, with all its imperfections; the other is the more careful copy of the pupil, with its perspective corrected—as witness the stool. The line of the tape is corrected; but the expression of the head is lost:—more careful but less masterly; greater labour, but worse artistic results—the differences between the two, however, being sufficient to produce general stereoscopic effect.

It may interest some of you to hear the opinion of one of the fathers of photography, the Rev. J. B. Reade, expressed a few days ago in course of some correspondence with a gentleman here, who, at my request, kindly allowed me to make such use of it on this occasion as I might deem proper; and whether or not you agree with the sentiments expressed by the writer, you will all at least agree that the opinions of a gentleman occupying such an exalted position in the history of photography is entitled to the highest consideration. He says:—

"Though their true character is denied by some, yet the solidity given to the figure by converging the optic axes settles the point at once. * * * I sent a copy of the drawings to my friend, Mr. ———,* who had not heard of the controversy, and I did not allude to it, as I wished for his simple opinion; and he has a very good eye, and is an expert photographer. He says in his note to-day:—'I tried the stereoscopic effect, and was much struck with the skill of the artist who could so well draw a pair of pictures. They certainly bear the stereoscope wonderfully well.' The stereoscopic effect is certainly very striking in the relative positions of the string, the legs of the compasses, and the right thigh; but the right leg is nearer the eye, both being above the thigh and in advance of the string. By reversing the figures all this is at once changed. The compasses are behind both the string and the thigh, and their left leg is nearer to us than the right; so that this part shows the stereoscopic effect to great advantage, and can scarcely, under the known philosophy of the time, be the result of mere accident."

I did not intend to have expressed any opinion on these topics myself; but as I have already, on another occasion, stated my belief as to the stereoscopic effect of these drawings, I may now state that I cannot, after repeated examination of them, come to any other conclusion than I formerly did, which was, that however the pictures have been produced—whether the one by the master, and the other, an imperfect copy, by the pupil, or whether drawn with the *intention* of being combined—the effect is certainly stereoscopic.

I cannot think with Dr. Carpenter that both pictures may have been taken at the same time by two different individuals seated slightly apart, as there is every indication of the one picture being copied from the other; and it is altogether against the doctrine of chances to suppose that so many peculiar points of difference between them can be the result of mere accident or carelessness in copying.

A lengthened conversation on the subject ensued, which will be reported in our next number; as also some discussion on the comparative merits of dry *versus* wet collodion plates for amateurs.

The meeting was numerously attended.

Foreign Correspondence.

Paris, April 26, 1862.

AN amateur, M. Civiale, has just made a very interesting communication to the Academy of Sciences. In the current of the year before last, and of the preceding year, M. Civiale had produced panoramic and detached views of a large portion of the Bernese Oberland, as well as the western slopes of the chain of Mont Blanc. Last summer he was again at work among the Alps, following the same course, and doing his utmost to supply facts for geology and physical geography. This year he has presented to the Academy four panoramas of the eastern slopes of Mont Blanc and of the northern slopes of Monte Rosa; likewise an album of detailed views from the valleys of Zermatt, Courmayeur, Ferret, and Bérard.

M. Civiale has introduced into his dry waxed-paper process an important modification, which I referred to a few months back. Instead of using wax alone, he now employs four parts of paraffin with one of wax.† The paraffin gives to the pictures greater delicacy, and allows the exposure to be shortened by one-third, while the wax helps to postpone the moment of fusion for the paraffin, and prevents crystallisation.

M. Civiale's work comprises two distinct parts—the detached views and the panoramas; which latter take in mountain chains in their general aspect, giving a clear idea of their configuration, and determining the geodetic elements of the different points. The picturesque occupies but the second rank.

The first panorama, composed of eight pictures, is taken from Mont Carmet, near Courmayeur. It is comprised in an angle of 170°, and represents the *ensemble* of the Mont Blanc chain from the Col des Fours to the Col Ferret, over an extent of about thirty-two kilometres from south-west to north-east. The standing-point is one of the summits of Mont Carmet, 2,962 metres above the level of the sea. This height rises about eighty feet above Mont Cramont, and is in a favourable position for reproducing the panorama.

The second panorama, composed of twelve pictures, is taken from Gornergrat, above Zermatt. It is comprised in an angle of

* The name here omitted is familiar to most photographers.

† M. Civiale has been anticipated in the use of paraffin by Mr. Burnett and also by Dr. Maddox in this country, both of these gentlemen having employed it some years since.—ED.

247°, and represents the chain of Monte Rosa from the Rothhorn and the Gabelhörner to the Strahlhorn, extending about fifty-three kilometres from north-west to north-north-east. The standing-point is 3,136 metres above the level of the sea. The numerous glaciers and masses of snow surrounding the summit of Mont Gornergrat sheds over the whole panorama a diffuse and dazzling light, which greatly increases the difficulties of the photographer.

The third and fourth panoramas are both taken from the same point of the Gagel, 2,707 metres above the sea, and embrace the whole circumference from the summits of Monte Rosa to those of the Bernese Oberland, hidden in the mist at the far end of the valley of St. Nicholas. These panoramas were taken in two days; but, as in each case the apparatus was placed on the same spot and in the same manner, the two views form a single panorama, and could be combined without any difficulty. The third panorama stretches from north-north-east to south-south-west, and is comprised in an angle of 208° 30'. It is composed of ten pictures, representing the Rothhorn, the Glacier of Findelen, the solid masses of Gornergrat, Riffelhorn, Riffelberg, and a few summits of the principal chain of Monte Rosa as far as Mont Cervin.

The fourth panorama running from south-south-west to north-north-east, and included in an angle of 168°, is composed of eight pictures, representing the secondary chains of Monte Rosa, which overlook the narrow valleys of Zermatt and St. Nicholas from the Grand Cervin to the Glacier of Findelen.

The series of detached views presents the Valley of Zermatt, different summits of the chain of Monte Rosa, a grand view of the Riffelhorn, the Glaciers of Gorner, of the Breithorn, of the Petit Cervin, of St. Theodula, of Furgge, of Zermatt, &c.; the Valleys of Aoste and Courmayeur, the Vale of Véin, the Glacier of the Brenva, the Vale of Ferret, the environs of Barberine, the Valley of Bérard, the Circus of Bérard in detail, Buet, Fitz, &c. An explanatory heading and reduced pictures of the panoramas complete the album.

Disderi has just published a volume, entitled *L'art de la Photographie*, which I have looked through with care. It will certainly be appreciated by a large number of persons. The work is divided into three parts. In the first, which is consecrated to the *matériel* of photography, the author gives a clear description of the apparatus employed by him, and shows what can be done with each of the instruments when skilfully handled. The second part treats of the collodion processes. The formulæ are precise, and the details sober but sufficient. These processes, though few, are good, for they have enabled the author to produce works which have established his reputation. In the third part, which contains considerations on the æsthetics of photography, Disderi develops his ideas and the results of his experience. The volume is completed by an appendix, summing up the principal processes for operating upon dry collodion; and it is preceded by an introduction from the pen of M. Lafon de Carmarsac, who has had a large share in the literary preparation of the book—at least in that which is not purely technical. The book is well written, and, though intended for instruction, is interesting.

While speaking of Disderi I must mention a project which he has conceived, and, indeed, begun to put into execution. The public are taking more and more to amplified portraits; but many photographic portraitists are unfavourably circumstanced for this kind of work, which demands space, sunshine, and very costly apparatus. In his two establishments Disderi has more than enough room for the various applications of photography; besides, he has had considerable experience in amplifying pictures by Wothly's process, which is his property. Disderi has therefore offered his brother photographers to undertake for them the amplification of portraits at a fixed tariff of prices. Several photographers have already sent him *clichés* to be amplified. I do not see anything to prevent the enterprise from succeeding.*

In the revived discussion concerning the drawings by Chementi belonging to the Musée Wicar at Lille, Sir David Brewster has done me the honour of mentioning my name in connexion with what I wrote to you at the time Mr. Bingham presented two reproductions of those drawings to the Society of Photography.

My respect for the illustrious *savant* would lead me to bow to his opinion in all matters of pure theory. I would not even venture upon a discussion as to what was the guiding thought of the artist. I merely proffer the observations I made in a recent and very attentive examination of the two drawings in question. My opinion is, that the left-hand drawing (in following Mr. Bingham's reproduction) is a copy of the other, executed by a pupil of Chimenti. Throughout I detect the hesitation and want of firmness of an unpractised hand. Several details, boldly struck off by the master, are awkwardly rendered by the copyist. Let me point in particular to the fold in the sleeve of the arm holding the compasses, the fold above the knee, and the line which marks the pocket. One feels that the pupil endeavoured to copy faithfully, but that, in the absence of the requisite skill, the hand faltered. Might not the differences which some attribute to a change in the point of view arise from the inaccuracy of the copy? I believe they might, and all the more so as in the second drawing the head is less bent: this could not come from a difference in the angle of vision. These observations are not exclusively my own: they have also been made by many painters to whom the reproduction of the drawings have been shown.

Reference is also made to what I had said by the Rev. J. B. Reade, in a letter which he has just sent to the *Journal of the Photographic Society*. He thinks that the stereographs of which I had spoken may not be the same as those which he has seen himself, and of which the *Journal of the Photographic Society* publishes a lithographed copy. I can assure him that they are certainly the same; but I must add that the reproduction inserted in the above-named Journal are too imperfect to enable one to judge of the originals. The details that I have spoken of above, and which are very important, are not at all correct.

And now let me speak of an innovation which may perhaps open up new paths for the photographic art, and which in any case merits attention. A manufacturer of fish oil at La Rochelle has been trying to apply the albumen of fishes' eggs to the preparation of photographic papers. One of his friends, who is an operator, has made some experiments, which have given pretty satisfactory results. In the specimen of the paper that I have seen the layer is strong and supple, has something unctuous about it, and presents the appearance of gelatine. It is too yellow in colour, but might be made paler, by the use of chlorine, for instance. It is evident that fishes' eggs contain something else besides albumen, and perhaps the new coating might prove useful in certain processes. It is at least a thing to be tried.

A few months since photography seemed on the point of being put down among the mechanical arts. The tribunals of Paris and Turin denied to its productions the protection accorded to the works of art. At present everything is getting right again. A bill before the British Parliament admits it among the fine arts, and the Court of Appeal has just set aside the first judgment in the matter of Mayer and Pierson. The following are the principal points of the new judgment:—

Considering that photographic designs cannot necessarily and in every case be considered as devoid of all artistic character, nor be ranked among purely material works;

That, in fact, these designs, though obtained with the aid of a camera and under the influence of light, may yet, in a certain degree, be the product of the thought, mind, taste, and intelligence of the operator;

That their perfection, independently of manual skill, depends largely on the reproduction of landscapes, the choice of a point of view, on the combination of the effects of light and shade, and likewise, in portraits from life, on the arrangement of the costumes and accessories, all which things are left to artistic feeling, and give to the work of the photographer the stamp of his individuality;

Considering that if the processes invented by Daguerre are public property, and that therefore every one may employ them, it nowise follows that those works which, with the help of these processes, are produced by the art and intelligence of the photographer, are likewise public property, &c.;

The Court sets aside the first judgment, and condemns the imitators.

ERNEST LACAN.

Philadelphia, April 8th, 1862.

During the past two weeks but little has been added of interest to our stock of information concerning the hot water development of tannin plates, as proposed by Dr. Draper. I have before me letters from amateurs who work the tannin process exclusively, and while some say they have tried the hot water with no good result, others are as decided as ever in favour of it. Those, however, who have failed may have erred on the side of too great contrast of heat and cold—that is, they may have had the water too hot; for one writer says he treated one end of a plate with hot water and the other with cold, and the hot end developed fully as to detail, but as feeble as an ambrotype; while the cold end came up as well in detail, more intense than the hot end, showing, however, a slight

* Although he does not exactly say as much, M. Lacan appears to imply that undertaking commercially enlargement from negatives by other photographers, and for their use, is a new idea. If he will refer to our advertising columns, he will perceive that this practice has already been in operation for some time in England.—Ed.

increase of intensity at a part of the cold end that had had an accidental flow of the hot water over it. He argued from this that too great a heat was detrimental to the latent image, and that the greatest good could only be obtained from a moderate increase of temperature. All this goes to show that it is like many other great discoveries, and that only after long and patient experiments, conducted under various circumstances as to the conditions of the chemicals used, &c., can the true value of the discovery be made manifest.

Having so often alluded in former letters to the general use here of ammonio-nitrate of silver for albumen paper, I am loath to occupy more of your space with the subject. There is reason, however, to believe that the very name of the so-called ammonio-nitrate solution may lead many into error concerning it. I think that in my first allusion to it I said it was more properly a solution of oxide of silver in nitrate of ammonia. The additions of ether or alcohol to assist the coagulation of the albumen is not a necessity of the case: many are using the solution without any such addition. But in such cases the solution is, as a general rule, made much richer in silver than when the ether is added—some using it as strong as one hundred grains to the ounce of water. From careful inquiry as to the exact condition of various silver baths used here of this kind, I think I am safe in saying that, if a solution of nitrate of silver sixty or eighty grains to the ounce be made, and to this solution nitrate of ammonia be added, taking care to keep the solution very slightly alkaline, the exact equivalent to these so-called ammonio-nitrate solutions will be produced. In no single case have I seen baths of this kind become discoloured from use; and, what is remarkable, the range of strength for good work is very much increased. At my suggestion, and in order to test the matter for the information of your readers, I requested an operator here to make up a new bath, eighty grains to the ounce, and to use this from day to day without adding any more silver to it until his prints should begin to show the want of silver. He worked the solution down too low for successful floating, and still the prints showed no symptoms of mealiness. The solution at this time showed by the hydrometer thirty grains to the ounce, and I cannot say how much longer it might have been used to advantage.

While on the subject of prints, I must mention some stereoscopic views of Niagara and its vicinity soon to be published by Mr. E. Anthony, of Broadway, New York. They are from a new set of negatives, and deserve more than a passing notice. Any one who has visited the Falls cannot have failed to notice how difficult it is to represent on paper or canvas the wonderful grandeur of the scene. Everything seems large in proportion, and it is not until one has walked himself tired, and looked up at the falling mass of water, and looked down the deep abyss, and spanned it in every way with his eye, thus gradually learning true distances, that the mind can estimate and fully realise its grandeur. Many of the pictures above alluded to are from new stand points, and, besides being charming prints, seem to express more of the striking features of the view than any stereograph heretofore published. Some of them will prove particularly interesting to geologists; for the huge masses of rock laid bare by the wearing back of the falls, through countless ages, is given with all the pre-Raffaelite perfection in detail that the camera only can give; and one is prompted at first sight of the picture to turn to Sir Charles Lyell's graphic description of the geology of the Falls, and to trace with his aid the nature and condition of the strata laid bare. I was glad—very glad—to see these prints, and to hear that they were soon to be published; for I began to fear that the card-pictures were fast driving the wonderful stereographs from the market.

Amateur photography here seems, however, to be devoting itself almost exclusively to the production of stereoscopic pictures, and the last exchanges of the Amateur Photographic Exchange Club show a decided improvement among all the members; and now it is only to be hoped that our friends "over the water" will share with us this pleasure of exchange.

Visiting our public galleries and asking what kind of work they are doing, we receive the constant answer, "*card pictures;*" and these same card-pictures seem to be a great trouble to some of the minor establishments. One of our German friends, who has a small glass-room, said the other day:—"Oh! we have so mooch troubles now! We have to print on two kinds of paper, and tone in two kinds of toning baths, and the business is not worth mooch!" On the other hand, we see our more enterprising photographers spreading their rooms in all directions, and not only enlarging their reception-rooms and show-windows, but adding extra glass roofs. In to-day's *Press* I have read an article on the subject of card-pictures, written, no doubt, by Dr. M'Kenzie: it was suggested by the great increase in size of one of our first-class establishments.

In applied photography I must mention some good copies of cards of Indian arrow-heads, designed to be forwarded to some of the European museums. It is a step in the right direction when amateur collectors of curiosities will have their collections so faithfully copied, and can send them to their co-labourers in the same scientific work. But it is to the machinist and manufacturer in metal and stone that this wonderful art is of the greatest benefit. An extensive manufacturer of iron railings and fancy castings once told me that the introduction of photography into his works was of the greatest use to him—that it had proved even cheaper than the old process of lithographing. That to have all his articles produced on stone, he had not only to depend on the truthfulness of the draughtsman, but, in order to reduce the cost on each print, he was always obliged to have many hundreds of each struck off at one time, while of many of the articles he would want to distribute but few, and hence his shelves were always encumbered with a useless stock. On the other hand, his negatives took up but little space in a fireproof room, and he was obliged to keep no great stock of prints on hand. So with locomotive builders. Upon the construction of some new style of engine, a finished drawing might be made in a few weeks: this drawing would then be some weeks more in the hands of the lithographer, and, finally, when the style of engine was old, and further improvements secured to warrant a new print, the proofs would come to hand, and even then would be found to have been incorrectly drawn, and be almost worthless. Now, however, the camera is to the engine-builder what the ordinary letter-copying press is to the merchant. The latter keeps the copies of his letters—perfect *facsimiles*—even to the undotted "i's," and the uncrossed "t's;" while the locomotive builder runs his finished engine on to the track, photographs it in as many positions as he pleases, and even before the ponderous machine has reached its destination he writes to its purchaser, enclosing a bill of lading, and photographs of the finished machine. It has been a matter of some debate whether machinery should be so taken as to exclude all other objects than the machine itself; and, as in many cases the accidental introduction of surrounding objects tends to confuse the picture of the machine, it is desirable to paint out the back-ground. This has been done in a novel way of late. A large amount of machinery had been made for the Russian navy yards, and some good prints 14 × 18 were preserved. It was desired to produce some 8 × 10 negatives of these same machines, to add to a uniform collection of that size prints. The large prints were stretched face down on a drawing-board and gummed on the back; when dry, they were cut loose and turned face up, and again stretched; next, they were worked up with Indian ink as perfectly as possible; and, finally, the machine was cut away from the back-ground by running the point of a sharp knife around the entire outline of each part. The gum on the back caused them to cockle out of shape, but, on laying them face down on a wet sheet of blotting-paper, they soon become straightened out, and could be transferred with ease to a wet sheet of very white card-board, and finely pressed down by rubbing each part with a burnisher. These cut-out pictures were then reduced by aid of the camera to the required size, and with a much improved appearance.

With my next letter I will enclose some of these reduced prints, and the proofs from which the touched-up pictures were taken. But when I do write again, it would be better for me to count my sheets of paper beforehand, and not begin on a full quire, else I may be led into always giving you more than you have room for, and we would be the losers by crowding out valuable matter.

COLEMAN SELLERS.

A New Cleaning Mixture.—Professor Joy, at a recent meeting of the American Photographical Society, gave a description of a new mixture for the removal of grease spots, and for polishing glass and metal, which he had found in a recent scientific periodical. It may be of use to photographers. Moisten calcined magnesia with pure benzine until the whole is wet enough to yield a drop of the liquid when pressed out: it can be kept in wide-mouthed well-stoppered bottles until required for use. Shake out a small quantity upon the grease spot, and press lightly with the finger: then brush off and repeat, and let a portion remain until the benzine has evaporated. Glass, mirrors, and metal can be cleaned with a piece of cotton and benzine magnesia. Stains upon maps, prints, books, gold, silver, tin, Brittania metal, brass, &c., are thus readily removed.

Notes of the Month.

THE same date these pages bear will record the opening of the (in every sense) *Great* Exhibition of 1862: the world's fair—nothing more—nothing less: the industrial produce of all the nations that on earth do dwell—of all those upon whom the primæval curse of *labour*—so often converted into a blessing—has fallen. From the uttermost ends of the earth people of every tongue or race have sent whatsoever work their hands have found to do. To wander amidst its mazes during the few last days of preparation ere the opening was to witness a scene not easily forgotten. As statue after statue was bared to the gaze, was, but for the noise, to realise a dream of the "Arabian Nights:" *with* the noise and hum of many tongues, we can remember no better comparison than the Tower of Babel.

Grumbling—that inalienable privilege of Englishmen—may be exercised by photographers with all the force imparted by a righteous cause. The eyrie in the Southern Tower, to which Photography has been banished—like a refractory child for correction—is so excessively hot, from its situation, that few will be able to stay there long enough to inspect the pictures, if they should by any chance find their way into such a remote region: and *the* way is not by any means easily found. Unlike other departments which have spacious flights of stairs, the entrance to ours is so small and mean as to be easily overlooked, resembling the entrance to servants' apartments more than anything else. Indeed, on our first visit we passed and repassed it again and again without finding it. Then comes "such a getting up-stairs as never was seen"—enough to discourage the most indefatigable sight-seer. The Royal Commissioners have *elevated* the art with a vengeance! There can no longer be any doubt of its being HIGH art! The temperature there was upwards of eighty degrees on the 24th ult. What it will attain to in the dog-days we dare not predicate. We overheard the poor sapper and miner stationed there bewailing his hard fate, evidently thinking the lines had *not* fallen to him in pleasant places. It is but fair to add that blinds will ultimately be fixed, and some ventilation attempted; but still it must be the "hot-house" of the building. Descending the staircase, and pacing along the cool vistas below, the contrast is forced upon the mind most painfully. Foreign photographers will have much the best of it in situation, being each in their national department. One lingers about the cool recesses in which they are placed, while in the other case the foremost feeling is to get away as soon as one can. Every one would wish the Commissioners, in the character of host, to do the correct thing by our foreign visitors; but it is not usual when receiving guests to dismiss your own family to the attic. It is most unfair to their fellow-countrymen. Once more, save us from our friends!!! Much noise is made about the sum paid for Frith's really splendid painting of the *Railway Terminus;* but little can be said about the commercial inferiority of photography when so large a sum as three or four thousand guineas has been paid by one firm for the simple privilege of photographing the Exhibition. Perhaps photographers can find consolation, as the poor student who, forced to live in an attic, found comfort in the thought that he was nearer the stars. Or will they, like Disraeli, say—"the day *shall* come when they will be listened to?"

The show is not on the whole so extensive as we expected, but every inch granted has been filled. Photographers would have liked their works kept more together; but we must assume it could not be, and some "skying" was inevitable. In Mr. Bedford's case (almost the only one) the pictures are admirably kept together. Some of Messrs. Colnaghi's people were employed, and entirely unqualified praise cannot be given them. A large table from Messrs. Lock and Whitfield has been placed in one of the very best places, by an "amendment of allotment," in some mysterious manner—which is a gross injustice to other exhibitors, thus giving one undue preponderance, more particularly when some of the works of T. R. Williams are thrust into a corner, and miniatures by Mr. Thomas Carrick were refused admission altogether.

Mr. Vernon Heath is said to have constructed one of the most perfect studios in London, and announces for publication, on the 1st of May, the last portraits for which his late Royal Highness the Prince Consort ever sat.

Lord Henry Lennox's motion for inquiry into the expenditure of the public money on the national art-galleries has come to nothing. The sum of £1500 has been put down for photography at the South Kensington Museum during the past year, and no details given.

Mr. Bedford's "Eastern Scenes" are to be published by Messrs. Day and Son. S. T.

Scraps and Fragments.

MASON *v.* HEATH.—This was an action tried at the Guildhall before the Chief Justice, when a verdict was found for the defendant [*ante* page 112]. The case was again brought before the Court of Common Pleas on the 17th ult., Chief Justice Erle and the other Justices sitting in Banco. Mr. Montague Smith, Q.C., moved to enter the verdict for the plaintiff on leave reserved. The facts are already before our readers. Rule *nisi* granted.

PHOTOGRAPHY IN AMERICA.—In a note recently received from Mr. Coleman Sellers, he says:—"In this country, I know not why, we cannot dispense with the bromides. I have tried it often, and the result was that unless the picture was exposed for nearly double the usual time no detail could be obtained in the shadows. The two pictures of machinery—one a lathe and the other of a wheel-press—show how we are illustrating our machinery."

PHOTOGRAPHIC DISSOLVING VIEWS.—The Easter programme of the entertainments at the Polytechnic Institution (London) contains the following:—"New and charming series of semi-stereoscopic views of the boulevards, public buildings, imperial palaces, and streets of Paris as it is, by Mr. England (artist of the London Stereoscopic Company), who has made these pictures truly 'life-like' by the introduction of the gay Parisians, their vehicles, their police, and military, who fill the busy thoroughfares of this beautiful city. N.B.—These views will be shown by an entirely new set of achromatic lenses, manufactured by Mr. Dallmeyer, and the description will be given by J. L. King, Esq."

THE JAPANESE AMBASSADORS.—The Japanese ambassadors have had their portraits taken at the photographic establishment of M. Nadar, Paris. The ambassadors showed the most lively interest in the operations, desiring even to enter the laboratory, and asking explanations about everything they saw. One of the officers of the suite took the album of the establishment, and drawing from his pocket a brush and ink requested M. Nadar to sit for his portrait. M. Nadar also called for a pencil and paper, and the two draughtsmen set to work sketching each other, to the delight of the ambasadors, who went from one to the other examining the progress of the work. Notwithstanding the politeness which is due to strangers, "we are constrained," says *Galignani*, "to declare that in the trial of skill between Europe and Asia, the latter could not boast of superiority."

THE EXHIBITION BUILDING.—The *Daily Telegraph*, in a recent leading article, gives vent to the following just estimate of the æsthetic qualifications of the big Brompton Factory:—"We have tried our very hardest not to grumble at the proceedings of the International Exhibition Commissioners; but we admit that it has become latterly impossible for us to preserve a due state of contentment and equanimity at the doings of the gentlemen at South Kensington. We have put on our rose-coloured spectacles; we have banished the gall from our inkstand; we would, if we could, write with a quill plucked from the wing of a dove; we would most willingly look at everything connected with the undertaking from the airiest, cheerfullest, hopefullest point of view; but, after all, we can't shut our eyes and our ears to the things we see and the things we hear. We must grumble a little. We must be cruel for a moment, only to be kind, since our complaints may haply move the Commissioners to amend the errors of their ways, and give us in future no cause at all to grumble. Let us hasten, however, to state, that we are not about to make the unhappy building itself a bone of contention. With one profound sigh, with one grievous gulp, we swallow the hideous goods-station, factory-run-mad-looking thing—the dish-cover domes and the preposterous sheds called annexes. We are willing to be friends with Fowke. *Habet*—he has got it. He has clutched the sceptre and the sway. He has proclaimed himself Lord Paramount of English art-edifices, and we must defer to his supremacy. Engineers and artillerists have just now got the upper hand; and perhaps Captain Fowke's next achievement will be a cupola British Museum, or an armour-plated National Gallery. He has put the Sheepshanks Gallery into an engine-boiler: perchance some day he will construct a factory chimney as the permanent home of the Turner Collection. For the nonce, however, we accept Fowke; we do not demur to Dilke; we throw ourselves at the feet of Cole; we recognise South Kensington as the grove of Academe, and the International Commission as the incarnation of æsthetic wisdom, sagacity, and good taste. The timid grumbling we this way give vent to has no reference to the construction of the Exhibition building, or to the contents of the Exhibition itself. It bears merely on a question of pounds, shillings, and pence."

PHOTOGRAPHY AND DIPLOMACY.—The Italian correspondent of *The Times*, writing from Turin on the 14th of April, says:—"A diplomatic mission to Persia is expected to set out from Turin in a short time. It is to be accompanied by a scientific deputation, including military gentlemen *and a photographer.*" What the duty of this gentleman will be is not stated; but it is evident, from the mere appointment of such an officer, that the important aid which our art is capable of rendering on occasions such as that alluded to is not undervalued by the Italian Government, but receives, on the contrary, due consideration at their hands.

INTERESTING FESTIVITY.—At Brunswick, on the 22nd February last, Messrs. Voigtländer and Son worthily celebrated the completion of the 10,000th photographic lens manufactured by that eminent firm. We append a translation of an article on the subject from the *German Reichs Gazette*:—

In the large hall of the Odeon we had occasion, on the 22nd of February last, to witness a festival which, as to its importance to German art and industry, may worthily be placed side by side of the celebration which Mr. Borsig, of Berlin, gave to his workmen on the occasion of the completion of the one-thousandth locomotive engine. In the optical establishment of Messrs. Voigtländer and Son the ten-thousandth photographic instrument had been completed already towards the end of the past year; and in the celebration of this event the head of the firm, Mr. Frederick Voigtländer, regaled his workmen with a splendid supper, followed by a grand ball, which was kept up until a very late hour, and was in all a very happy affair. The ten-thousandth instrument had been retained for the occasion, and stood finely decorated in the hall, surrounded by Austrian and Brunswick flags, transparencies, &c., headed by a portrait of Mr. Voigtländer. At supper a large silver cup was presented to Mr. Voigtländer by the oldest workman, and an appropriate address made by Mr. Rossing, also one of the oldest men. After the ball Mr. and Madame Voigtländer were serenaded at their residence. As we spoke of the importance of this celebration, we perhaps owe a proof of it, which will be the more welcome as nearly everybody is interested in photography. When Daguerre made his famous invention he was confined to taking lifeless objects; for, as is universally known, at that time only lenses of weak power of light were used. It was not until Voigtländer came out with his double lenses, made according to the calculation of Professor Petzval, that it was possible to take portraits. The grand achievement was then universally applauded, and the inventor awarded by a medal struck expressly for this purpose in Paris. It was only a natural result that owing to the great success of Voigtländer many manufactories of such lenses were opened in all countries; but up to the present day the lenses of Voigtländer have preserved their old fame, the best proof of which is the 10,000th lens, and the fact that they are found in all the first establishments in the world. The manufactory of Messrs. Voigtländer and Son has recently been vastly enlarged, and yet it is impossible to satisfy the daily increasing demands. They count on making 2,000 lenses this year, whilst the 10,000 have been produced in twenty years, which gives an average of 500 a-year. Besides these lenses the firm produces also a very large number of opera-glasses, which they also made first with achromatic eye lenses. These are principally bought in England, where they are universally known by the name of "Voigtländer," and at races will be found in every gentleman's hand. It would lead us too far to enumerate all the different branches of the establishment, and we will therefore confine ourselves to mentioning that, even twenty-five years ago, Mr. Voigtländer produced telescopes which, according to the judgment of Gauss, Schumacher, and others, were found equal, and even in some respects superior, to the renowned Fraunhofer telescopes. The present proprietor of the establishment, which was founded one hundred years ago by his grandfather, has always been on the alert to extend the business as much as possible, and has succeeded in doing this principally by his connexions with other countries. We meet thus here the rare combination of artistic effort and commercial enterprise. We conclude this report, which we felt ourselves bound to make, by the hearty wish that we may soon be able to congratulate Mr. Voigtländer on the completion of the next 10,000th lens.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE CHIMENTI PICTURES.

To the EDITOR.

SIR,—Pray let me give my reasons for differing from you in opinion respecting the interesting pictures by Chimenti; and I am the more anxious to do so because the lithographs just given us in the *Journal of the Photographic Society* do not decidedly carry on the face of them the proof of my assertion that the right-eye picture is a copy of the other, and is not, as you suppose, the simultaneous work of another artist on a right-hand chair.

The able lithographer, to whom we are much indebted, has not copied the stereographs *touch by touch*. It would be almost impossible to do so. But the faithful photographic rendering given to us by Bingham exhibits far too many *minute points* of exact resemblance in the originals to make it possible for the second picture to be other than a copy of the first. I feel sure that your own examination of the photographs will conduct you to this conclusion.

But while designed coincidences and, perhaps, somewhat inferior handling establish the character of *the copy*, designed differences equally prove it, to my mind, to be a right-eye picture. The parts of the picture which require special alteration for this purpose are those which lie in different planes parallel to the paper—as, for instance, the string, the legs of the compasses, and the knees; and here we find, as a simple matter of fact and measurement, that the required conditions of relative distance for a right-eye picture are well maintained—so well, indeed, that, like Dr. Carpenter's truncated pyramids, not only do the compasses advance or recede by near or distant convergence of the optic axes, but the legs themselves so change places with the change of vision, that the nearer leg by one convergence becomes the more distant by the other. A pair of compasses in a modern similar picture could not obey the laws of vision better than Chimenti's.

We must admit, however, that if we deal rather hardly with the old artist and put him into a stereoscope, which is a very crucial instrument, then defects which the naked eye had almost passed over become so apparent as to throw doubt upon his right eye. But, as these defects are in the unimportant parts of the picture, and not where the distance from near to far points is considerable, we seem to be justified in the supposition that right and left-eye pictures were intended to be drawn. It is quite another question whether they were intended to be viewed as *a pair*. If they were, then the early artists, besides the parallax of near objects, which of course they saw, would have been equally with ourselves struck with admiration at the depth and solidity of their work, and the third dimension, with the charms of relief, would have been felt then as now in all its power; and, had it been thus seen and felt, could it by any possibility have been forgotten?

A naval friend of mine, accustomed to the use of instruments, after reading the above, suggests the following solution:—"The artist represents himself as looking intently at the string with the left eye, and about to use the compasses for measuring the parallax of the string, when referred to another part of a more distant plane, by reversing the sight to the right eye." I cannot deny this. Can you? The principle, *being thus known*, is applied to the right and left-eye pictures which represent its illustration; and the fact of our now making these pseudoscopic in their principal distances by transmission, takes them out of the category of accident and guess work.—I am, yours, &c., J. B. READE.

Ellesbro' Rectory, Tring, April 16th, 1862.

[The supposition of the pictures having been taken by Chimenti and a pupil simultaneously was Dr. Carpenter's rather than ours; but we thought it a very plausible solution of the apparent mystery. We examined the photographs very carefully, and cannot at all concur in the view taken by our rev. correspondent, when he assumes that the coincidences and differences were *designedly* made so. That is, in fact, begging the whole question at issue. Nor can we assent to the proposition that the defects are in the *unimportant parts*, unless, indeed, such a term can be applied to *the parts of a man's head*. Again, our correspondent makes no attempt to explain or justify the *vertical* differences, which are alone quite sufficient to indicate the absence of knowledge of the principles of binocular vision in the artist.—ED.]

PANORAMIC PHOTOGRAPHY.

To the EDITOR.

SIR,—It is more than probable that the New Jersey correspondent of *Humphrey's Journal* would not have been so enthusiastic in claiming priority of the invention of the panoramic lens on behalf of an American citizen had he known that gentleman to be "a Britisher." Such, however, is the fact. Mr. Ross is a native of Scotland, and a near relative (I believe a brother) of Mr. Ross, of Edinburgh.

That he did produce an instrument capable of representing an extended picture upon a flat plate of glass you already know, and, if not, the specimen I now send you will testify. This specimen was sent to me by Mr. Ross, from America, so long back as 1857. I regret that I have not now by me, also, a large amount of correspondence from him, a great portion of which, however, did appear from time to time in the pages of the BRITISH JOURNAL OF PHOTOGRAPHY, then called the *Liverpool Photographic Journal*.

Frequent mention was made therein of the capabilities of this instrument, which he had called the "scioptric" camera; but not enough was given of its structure and mode of working to justify making the matter public.

I have purposely refrained from calling Mr. Ross's invention a panoramic lens, as it is styled by the New Jersey writer, because I believe that both in this idea and also that of Mr. Sutton such title is a misnomer; as it is the method of mounting any kind of lens in the camera, and the extension of the plate, whether concave or flat, beyond the range of such

lens (unless either plate or lens be shifted to take in the section of the horizon), that complete the panoramic effect.

The lens here, you will perceive by the specimen, had no particular merit, but appears to have been of very ordinary character. The peculiarity must have been, I conceive, in the form and mode of using the camera; and I am now about to hazard a conjecture as to the actual construction of this apparatus.

Certain lines upon the picture, you will observe, that are uniformly vertical, denote that there was lateral motion during the exposure. It is possible that the camera *was nothing but* "a block of wood, with a long mortice cut in it;" but then the light, I apprehend, was not "admitted through that."

I surmise that the camera itself was fitted upon a centre, but allowed slight motion, and that during exposure it was slowly rotated; and at the same time the flat prepared plate was as slowly drawn through "the long mortice," so as to present a fresh surface just as rapidly or slowly as the lens in its transit delineated a fresh object. This may be easily conceived by covering the whole concern with a black cloth, attaching a string to the plate-holder, and by securing this to a nail, the mere act of rotating the camera would gradually draw the plate through.

The supposition that this or something analogous to it was the mode of operating, is fully confirmed by the time of exposure marked upon the back of the photograph. The shadows from the buildings clearly indicate that the sun was shining brightly; and yet the time of exposure is stated to have been 4 minutes 35 seconds—a most unreasonable time for a positive on glass, unless some unusual operation was going on at the time, such as continually presenting a fresh point of view.

As I have always found Mr. Ross most gentlemanly and considerate, it is possible these crude notions may have the effect of causing him to correct me should I be wrong, and so to give to the world the result of his experiments. A very little improvement in this contrivance would, I fancy, give it a vast superiority over the curved apparatus.

This latter may be a great boon to workers on waxed paper; but, as regards operators upon glass, it seems calculated only to benefit makers of, and dealers in, material.

The real merit—if any such there be—of first producing a panoramic camera belongs, in fact, to M. Lerebour, by a priority of ten years at least. So long back as 1846, a semi-circular camera made by him was shown in London. The front of it was made of flexible Mackintosh cloth. The lens being fitted on a pivot in the centre, was capable of being rotated by an endless screw adapted to the teeth of a cog-wheel at the bottom of the centre-point, and the whole was worked by a small winch.

As no other photographic material was known in those days but the silver plates used for M. Daguerre's process, these were easily made as long as required, and as easily bent into the form necessary, with this additional advantage, that all round the back was a series of brass screws, that could press forward, if needed, any portion of the plate when an adjacent object might not be in true focus—an arrangement, it is needless to say, quite inadmissible with glass plates. I know not if the front of Mr. Sutton's camera be constructed like this; for, having, as actors say, "retired into the obscurity of private life," I have never seen one of them. I am, yours, &c. C. COREY.

[The camera described by Mr. Corey as Lerebour's was, we believe, though made by him, the invention of M. Martens, and we remember examining one of them in the possession of our friend Mr. Hodgson, in 1851. The specimen received possesses all the worst features of a panoramic picture; in fact, the subject is quite unfit for panoramic delineation, as the curvature of the horizontal lines cannot fail in a street view to be most offensively prominent.

Mr. Sutton's panoramic lens certainly performs its work much more scientifically than any rotating lens and moving plate, the whole picture being taken simultaneously. Nor is there any reason why adjusting screws to vary the distances of parts of the plate from the lens should not be employed, when the former consists of any flexible material. Of course the faults of delineation inherent in panoramic pictures must exist, no matter what kind of lens be employed.—Ed.]

MEALY PAPER.—POST-OFFICE REGULATIONS.

To the Editor.

Sir,—I enclose sample of a mealy print as taken from the frame, and before washing or toning. I think it confirms my opinion that mealiness is not *caused* by washing, toning, or fixing; but arises from bad quality of paper, or in the albumenising.

In passing through the post-office this morning I saw a notice to the effect that stereoscopic slides will be examined, and, if indecent, stopped or forwarded in sealed envelope, of course charging extra postage. Of course I should not advocate either the transmission, sale, or production of those slides; but I do not think the post-office authorities have the power of selection, any more than that they could stop a newspaper containing a divorce case, or open letters to see if they contained anything improper.

I am very much pleased with that small portrait of yourself which I saw at the North London meeting; but I would like to know by what lens it was taken—whether half or quarter-plate. I notice that the *whole* figure is sharp. I am, yours, &c., H.

[We are of opinion that what is termed "mealiness" does frequently arise from several different causes, of which that indicated by our correspondent is undoubtedly one.

We know not whether the post-office authorities have the power (legally) to do what is indicated; but we cannot regret the exercise of it in such cases. The misfortune, however, is that the many will suffer inconvenience in consequence of the malpractices of a few disreputable scamps.

The portrait was taken by our friend Mr. Mayall; and we happened to notice that a pair of lenses made by Mr. Dallmeyer for *card portraits* were used, but we did not observe either their focal length or diameters. —Ed.]

HOT WATER PRIOR TO DEVELOPMENT.

To the Editor.

Sir,—Having seen in some of the photographic journals the use of hot water prior to development advocated as if the suggestion were of recent date, I beg to say it was known to me and several of my photographic friends four years ago. The circumstances of my first using hot water for dry plates are the following:—Having plates prepared with gelatine, and finding a difficulty in getting clean sharp pictures (small blisters appearing all over the plate, arising from the swelling of the gelatine), I used hot water with the view of removing the gelatine from the plate prior to development, and to my astonishment the picture began to make its appearance. I therefore continued the hot water till it was a perfect picture, without any other substance, and repeated the experiment with the same success. A paper was written on the subject, and read before the members of the East London Photographic Society, and addressed to Mr. Crookes, the then Editor of the *Photographic News*. That gentleman took no notice of it—no doubt thinking it to be an East London blunder—or the subject would have been before the public four years ago. I believe the first picture to be in the possession of Mr. Nichols, in whose laboratory the experiments were first tried.

April 20th, 1862. I am, yours, &c., H. E. CHALKLY.

[We insert this note as received, though evidently imperfect in information, no particulars being given to show of what material the picture alleged to have been developed was formed. A dry plate generally indicates the removal of all free nitrate of silver, but in the instance quoted we presume this cannot have been the case. We hope to be able to afford more detailed information in our next.—Ed.]

THE SOUTH LONDON SOCIETY'S EXHIBITION AT THE CRYSTAL PALACE.

To the Editor.

Sir,—Will you kindly permit me to call the attention of intending exhibitors to an alteration which has been made in Rule 7. Instead of sending plain copies in the same frames with the painted photographs it is requested that they be sent separately.

The reasons for such alteration are so ably stated in the enclosed letter from M. Claudet, that I venture to ask you to publish that also, as containing hints worthy the attention of managers of photographic exhibitions generally.

I may just add, perhaps, that while we shall gladly exhibit specimens in which the combined talents of the painter and the photographer have produced pictures worthy of their united efforts, neither "daubed" photographs, nor those which have the "tea-boardy" smoothness, too commonly admired by vulgar taste, will be likely to find admission.

I am, yours, &c.,

35, *Westbourne Grove*, *Bayswater.* ALFRED H. WALL, *Hon. Sec. South London Society.*

Alfred H. Wall, Esq., *Hon. Sec. South London Photographic Society.*

Sir,—Although I have expressed the opinion that the Crystal Palace was not the most eligible place for an exhibition of photography, as an annex to the International Exhibition of 1862, I think that, if no convenient locality can be found in some central part of the metropolis, this opportunity of displaying the photographic productions which cannot be admitted into the building at Kensington should not be refused.

Therefore, in answer to your favour of the 7th instant, I beg to say that, far from having any idea of opposing the plan proposed at the Crystal Palace, I will be glad to give it my concurrence in furthering its object, by becoming a contributor to the Exhibition, and adhering to the rules of the prospectus you have sent me.

Respecting these rules, however, I venture to call the attention of the Committee to one—the seventh—which seems to me objectionable, as capable of spoiling the general effect of the Exhibition in an artistical point of view. I think that coloured and black photographs being intermixed will injure each other, and produce a disagreeable appearance. No man of taste would ever think of hanging in his drawing-room paintings and engravings together. He will devote one room exclusively to one kind of pictures, and another room to the other kind, because both will gain by being exhibited separately.

It is very proper that no painted or coloured photograph should be admitted without an untouched original, to prove that the artist has not changed the character of the photograph—in which case the painted or coloured picture would have nothing to do with photography, only exhibiting the skill of the painter. Therefore I approve the obligation that every painted or coloured specimen should be accompanied with its original photograph, but only for the inspection of the Committee; and, when both admitted, they might be placed each in a different department of the Exhibition—all the painted pictures in one and the black photographs in another. In the catalogue they might both have the same number and description, by which visitors could be referred, in order to compare the two, if they wish it.

The fact is, that an exhibition of photography should be composed only of black untouched photographs; and persons interested in the science and progress of the art should not be distracted by the sight of paintings showing only the talent of the artist who had been employed, to please those who do not care for photography. But as this last class is very numerous, they might have the satisfaction of examining exclusively, if they liked, the kind of pictures more in their taste. Therefore, I think that the effect of the Exhibition would be much improved by placing all the *real* photographs in one department, and all the *daubed* ones in another. This I submit to your consideration.

I am, dear Sir, yours very truly, A. CLAUDET.

107, *Regent Street, April* 9, 1862.

THE MICROSCOPE.

To the EDITOR.

SIR,—I have just noticed in the pages of a contemporary a report of the meeting of the North London Photographic Association, in which there is evidently a serious mistake committed. Mr. Thomas Ross is made to say, in reply to an appeal from the Chairman, "that his knowledge of the microscope was limited." I have no doubt that Mr. Ross is a very retiring and unassuming man; but surely it would have been mere mock modesty for him to have made such an assertion, as few, if any, can know more of the microscope than Mr. Ross.

I am, yours, &c., W. H.

[Our correspondent is quite correct in his conjecture about Mr. Ross's abilities in the direction indicated. The usual reporter for our contemporary was not present at the meeting, and a stranger performed the duty: hence the mistake, no doubt. What Mr. Ross did say was—"That he had but little experience *in photographing microscopic objects.*"—ED.]

MULTIFARIOUS TROUBLES.

To the EDITOR.

SIR,—If "S. S. L." (page 159) pours over the plate, after developing with iron, a solution of one grain of iodide of potassium, one grain of iodine, one ounce of water, and then *well* washes the plate, he will have no reason to complain of the reddish-brown stain.

The blue stains I fancy are the result of not completely washing off the cyanide before using the pyrogallic acid solution. I have found these latter troubles only when the bath has become much weakened by use; but, as I always use hyposulphite of soda, I cannot speak with certainty.

I am glad to see that you are going to push the question of the field of view of the triplet *versus* single lens to an "absolute focus." I am wavering between the two for landscape purposes. *Cæteris paribus*, I need not tell you that a wide angle is an immense advantage.

I am, yours, &c., R. G.

QUERIES FROM INDIA.

To the EDITOR.

SIR,—You will be doing myself, and probably many other amateurs in this country, a great service by replying to the following inquiries:—

1. Is it better to use *acetic* acid in the silver-sensitising bath for bromo-iodised collodion than nitric acid? Mr. Thomas—who is, I believe, an authority in these matters—recommends nitric acid; and so does Mr. Hockin. Mr. Hardwich, I observe, recommends *acetic* acid. Most of Mr. Thomas's collodions are, however, simply iodised with the iodide salts, and it has occurred to me that it is with reference to this peculiarity that he recommends nitric acid for the sensitising bath. I am strengthened in this conjecture by finding that Mr. Thomas has recently recommended acetic acid in the silver bath for his magnesium collodion, which contains, I believe, a *bromide*. Your opinion on this point will be useful to many who, like myself, are ignorant of the *chemical* principles involved.

2. When a bath is acidified with *acetic* acid, what is the best way to neutralise it? Can oxide of silver be used? And supposing carbonate of soda had once been used for neutralising it, can oxide of silver be used afterwards?

3. What is the general tendency of *bromo*-iodised collodions—to render the bath alkaline or acid? And when once the bath has been acidified with acetic acid, can *nitric* acid be afterwards used, in the event of the bath requiring acidification?

4. Is there any permanent advantage to be gained by putting a weak solution of caustic potash into the bath when protosulphate of iron is used as a developer for *negatives*? Would caustic potash (even in minute quantity) deteriorate the bath?

5. Is there any advantage in adding strong liquor ammoniæ to protosulphate of iron when developing negatives, as recommended by Mr. H. Mattheson in a recent number of your Journal? And is there any *peculiarity* in Mr. Mattheson's collodion or iodiser which specially adapts it for such a developer?

6. Is the protoacetate of iron as easy to develop with and as good a developer for negatives as the protosulphate of iron followed up by pyrogallic acid? Kindly give a formula for a protoacetate of iron developer suitable for this climate, and for a *bromo-iodised* collodion; and mention whether it will or will not be necessary to intensify a negative so developed with pyrogallic acid and silver.

You will kindly bear in mind that neither amateur nor professional photographers in this country have one-half the advantages of their brethren at home in pursuing their delightful art. We labour under all sorts of disadvantages in this country, and are ignorant of many *little* but really essential points, which, being commonly known among operators in England, are never deemed worthy of being alluded to in the journals. The consequence of this is that we plod on in the dark, depending on our own experiences, which, as you can imagine, are sometimes dearly bought.

It is found, I believe, that a *bromo-iodised* collodion is the only kind that can be in a manner depended upon throughout the year in India. So that if you can find space for this letter and the answers required—and if you can give any useful hints regarding the use of such a collodion (the great difficulty is to get sufficient *intensity*)—you will much oblige

AN OLD CALCUTTA SUBSCRIBER.

Calcutta, March 3*rd*, 1862.

P.S.—I gather from the journals that iron is coming into very general use for development of negatives, especially on the Continent. If you can give a good formula for an iron developer I shall be obliged to you. Should the iron solution be allowed to remain on the plate until *all the details are out?* or should it be poured on and thrown off immediately after the details begin to show?

[1. Acetic acid in the nitrate of silver bath is more conducive to the production of density in the negatives than nitric acid, and bromides in the collodion have an opposite tendency: hence the two, when properly united, produce an equilibrium. Your conjecture is therefore well applied.

2. Carbonate of soda will neutralise the bath that has acetic acid in excess, forming therewith acetate of soda. Oxide of silver may be used, and acetate of silver will be formed and partly dissolved; but probably needle-like crystals of acetate of silver will also be formed, and these require to be removed by filtration. You may employ one, after the other has been used on a previous occasion; but it would be superfluous to use both immediately following one another. A bath thus treated with either will have a tendency to produce dense negatives.

3. Good bromo-iodised collodion ought not to render the bath either acid or alkaline. We see no valid reason why nitric acid should not be employed as you propose.

4. No.

5. We are not acquainted with the constituents of Mr. Mattheson's collodion, and we have never tried the plan proposed by him. We do not perceive any special advantage likely to be gained thereby.

6. We do not consider the protoacetate of iron so useful a developer as the protosulphate of the same base, and it is more unstable, especially in a hot climate. To prepare it dissolve twenty-five grains of protosulphate of iron in an ounce of water, and twenty-five grains of acetate of lead in a like quantity of water: mix the two and stir. A white precipitate of sulphate of lead will be formed, and the protoacetate of iron left in solution, which must be filtered before use. The following is Mr. Heisch's formula for a collodion which would be suitable for the above developer:—Pyroxyline eight grains, pure ether five drachms, strong alcohol one drachm: to the preceding add two drachms of iodiser, made of alcohol two ounces, iodide of ammonium thirty grains, bromide of ammonium ten grains, chloride of calcium three grains. The *negative* will probably be dense enough, but, if not, may be intensified with the usual pyrogallic developer and a few drops of silver solution.

The following is a good iron developer, viz:—Protosulphate of iron twelve grains, water one ounce, glacial acetic acid thirty minims. It may be kept on the plate till all the details are out.

We do not imagine you will require to use an iron developer, because you complain of want of intensity, and because, generally, iron developers are more useful in *cold* weather. They are chiefly used here and in France in order to obtain *softer* negatives than we get with pyrogallic acid; but we do not, personally, deem this needful, as we are of opinion that soft negatives may be obtained by either kind of developer, if properly applied. We are, however, convinced of the advantage of iron developers in *cold* weather; but always avoid them when the weather is hot.—ED.]

STEREOSCOPIC VISION.

To the EDITOR.

SIR,—It is very convenient and pleasant to be able to see a stereoscopic picture stereoscopically with the "naked eye."

I have observed, however, when doing so, the following fact, which, so far as I know, has not yet been publicly stated, viz.:—That to get a *true* stereoscopic effect with the unaided eyes, the prints *must not be reversed*, as they are when taken with a bi-lens camera. If they *are* reversed and are then combined by the unaided eyes, distant objects come forward out of their plane, just as they do *in the stereoscope*, if they have *not* been reversed when taken by the bi-lens camera. Doubtless this might have been anticipated, but I should like to see the matter explained by one of your many scientific correspondents.

I am, yours, &c., SAMUEL EVERSHED.

Brighton, April 25th, 1862.

[There are two methods by which stereoscopic vision can be obtained with the unassisted eyes—that is to say, by squinting inwardly or by squinting outwardly. In the former case, the effects described by our correspondent occur, but not so when the latter expedient is adapted. Inward squinting produces the effect of a small and nearly placed solid model; outward squinting, on the contrary, a large and distant one. These phenomena have been discussed before to some extent, but are quite unfamiliar to many.—ED.]

A MARE'S NEST.

To the EDITOR.

SIR,—What, in the name of all that is photographic, can the editor of your contemporary, the *Photographic News*, mean by a most extraordinary assertion which he makes in his last number? After a rather complimentary notice of an album for photographs, which he has received from M. Bourquin, he says:—

"A correspondent of a daily paper remarks on *this notice*:—'Is it for the sake of the postal revenue, or from a desire of the authorities to patronise obscene art—or do they lack the legal power to destroy such pernicious things? Her Majesty's customs at once seize and destroy all obscene prints and the like productions, whether imported with merchandise or in passengers' baggage, and occasionally the police and the Society for the Suppression of Vice show activity in prosecuting the miscreants who, for gain, pander to the morbid passions and sensual vice. Your readers may blush for their country when they read such a public official notice, if the Postmaster-General does not; and I hope that the notice may be withdrawn for a more stringent one.'"

I really am perfectly amazed at the preceding: it appears to me *perfectly astounding*.—I am, yours, &c., A. MAYER.

[If our correspondent had only read to the bottom of the column he might, perhaps, have discovered that the *contretemps* is most likely due to the compositor having, when setting up the "formes," mismatched the heads and tails of the paragraphs, though it certainly does look droll as it stands.—ED.]

PHOTOGRAPHING CRYSTALS.

To the EDITOR.

SIR,—I do not "*propose*" to do anything with polarised light in taking photographs of crystals: I merely allude to what *I have done* by its aid. Before anything was known publicly about Mr. Crookes's experiments (some years ago) I was working at the same subject, and took my results to old Murray, who at that time was at Newman's, and he quietly opened a drawer and took out similar photographs which Mr. Crookes had left with him *a day or two* beforehand. I then gave my attention to photographing *thin* urinary salts, and obtained faces *well marked*, that were not so without the aid of polarised light. I used a reflecting bundle of thin glass for the polariser, a Darker's selenite stage, and a Nicol's prism behind the object-glass (no eye-piece). I am, yours, &c.,

70, *Dean Street, Soho, London, W.*, S. HIGHLEY.

April 15th, 1862.

[The preceding arose in course of correspondence, and we have thought it worth recording, which we have done with the permission of the writer of the note.—ED.]

ANSWERS TO CORRESPONDENTS.

TO ADVERTISERS.—Several Advertisements have reached the Publisher too late for insertion in this number.

H. J. D.—About fifteen feet will do, but eighteen feet is better.

F. A.—We must decline your proposition, with thanks for the offer.

CHAS. LAVEY.—You will find what you seek in numbers 132 and 135.

L. C. J.—Of course he is wrong. Wait a little, and we will show you where.

O. P. R.—We have never seen the work to which you allude: if you will send it for our inspection, we will give an opinion.

A.—We have been watching the progress of the experiments carefully, and may have something to say on the subject shortly.

PUZZLED BEGINNER.—It is evident that your so-called dark slide is not properly light-tight: witness the same fogging on the edge of each plate, with the extra *dip* ot one corner. You should examine your camera to see whether light does not leak in somewhere.

NEMO.—Your article, though well written, is not adapted to our columns, which are occupied exclusively with matters connected with photography. Send your address, and we will return the MS., which may suit one of our purely literary contemporaries.

VERDANT GREEN.—You cannot develop a dry plate of any kind properly without the addition of free nitrate of silver at some stage of the process—least of all Dr. Norris's plates. You had better obtain some good manual, of which there are several in the market.

STEREO.—Personally we regard the arrangement of Mr. Emerson's adjusting stereoscope as a useless complication; for not only is a special adjustment needful to be made for each individual, but also for many stereographs, in order to take advantage of the principle involved.

INQUIRER.—Our contemporary assumes (unwarrantably in our opinion) that he is not called upon to acknowledge the articles translated from *Le Bulletin de la Societé Francaise de Photographie*, upon the ground that they were read publicly at the meetings of that body: hence the fact you notice in a recent number.

SCRUTATOR.—The pose is not badly designed, but imperfectly carried out. The attitude indicates repose, but there is a rigidity about the right leg that belies the reality of the idea. During sleep *the whole body sleeps*—the hand and the foot as much as the head. So, also, in abandoning oneself to rest, the whole body is in quietude.

T. H. S.—If you omit saturating the nitrate of silver bath with iodide of silver, you will be liable to having your plates *riddled* with minute pin-holes. A very simple way of iodising your bath is to coat a plate with iodised collodion, immerse it in the bath, and leave it there all night. Rain water will do very well. Boil for half-an-hour and filter if need be.

JAS. ROBSON.—No wonder your are unable to verify the accuracy of the assertion practically; because it is *not* founded on fact. The gentleman you name knows little or nothing of scientific matters, and perhaps least of all as regards optics; and in the assertion made recently he has simply made a mistake, as we may possibly have reason to show ere long.

DRY PLATE.—Major Russell, we understand, has made several important improvements in the tannin process, which will give greater sensitiveness, and has devised a mode of treatment by which the preliminary coating may be dispensed with. These improvements will be published in due time. You cannot do better, in the meantime, than make yourself familiar with the process as originally published in Major Russell's book.

P. P.—No doubt your bath was charged with organic matter of some kind, probably albumen—when the oxide of silver produced by the addition of the ammonia would probably have formed a compound with the organic matter, being the gelatinous white precipitate which you describe. In your second experiment the liquor ammoniæ was no doubt *in excess*; and as oxide of silver is soluble in excess of ammonia, of course no precipitate was apparent. Had you added but a few minims of ammonia you would have found a greyish-coloured precipitate.

DISAPPOINTED BUYER.—Advertisers are not, as a rule, addicted to claiming too little for the qualities of their goods; but in your case the claim seems to have been grossly overdone. We can only advise you to try another house. There are many which may be relied on whose names are to be found in our advertising columns. We are happy to notice that the one of which you complain is *not* there; but, if it were, we could not help it, for we have nought to do with that part of the Journal.

A CONSTANT READER.—W. T.—1. Your disaster is by no means an uncommon one, where the varnish employed is of foreign manufacture, owing to the goodness of the spirit used as a solvent. Some kinds of pyroxyline are more or less soluble in *very strong* alcohol; and no doubt that you have employed is of this kind. Your remedy would be, either to reduce the strength of your varnish by adding thereto some common spirits of wine, or, what is better still, by coating your negatives with albumen just after the final washing, and well drying before applying the varnish.—2. There is no doubt that the front lens of the combination you name will cover the sized plate quoted.

W. S. (Belper.)—1. It is difficult to define for another which is the *best* Ross provides an exceedingly handy one, so do Horne and Thornthwaite, also. Hare, and Murray and Heath.—2. You should not cut and transpose your transparencies, but print them in their proper positions at once. You can either cut your negatives or print at two operations as you prefer. The proofs should not be cemented to the ground-glass, but have a piece of thick paper fastened near to their edges in order to prevent actual contact, and the two pieces of glass should then be cemented together by pasting or glueing a dark paper binding over the edges. Instead of ground-glass, you will find it easie to use a varnish sold by Messrs. Horne and Thornthwaite to produce a simla effect.—3 and 4. Cold nitric acid will dissolve the silver, but the application of heat will hasten the solution. You are not likely to produce nitrite of silver in the operation, and if you did it would be of little consequence unless you found it to cause foggy proofs, in which case the addition of a little pure acetic acid would remedy the defect. It is not easy for a novice to detect the presence of nitrite of silver, except by the effects above indicated.

RECEIVED.—We have received an important article *On the Equivalent Focus of Photographic Lenses*, &c., from Mr. Grubb; but we are reluctantly compelled to postpone its insertion till our next number.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 166, Vol. IX.—MAY 15, 1862.

The International Exhibition.—Words are altogether inadequate to convey any just idea of the intense disgust with which we made our first acquaintance with the locality to which English photography has been condemned. Not contented with sneering at and heaping every indignity upon our art with regard to classification, the Royal Commissioners have broken faith with photographers in not keeping the pledge which they made—nominally as a concession—in undertaking that photographs should be exhibited in a separate apartment, but have added this above all, that the *portion* of an apartment shared with maps, plans, and a heterogenous mass of objects exhibited by the Educational Commissioners, has been also cumbered with a quantity of photographic apparatus, and the whole is so contrived that it is little short of a miracle when any one who happens to be aware of the existence of such a department can by diligent inquiry and perseverance manage to find his way to it. We can only liken the said apartment to an attic, high up above the picture galleries, access to which is attainable exclusively by means of a kind of back staircase, the entrance to which is carefully hidden away so as to escape observation as much as possible. The opening to the staircase when found looks merely like the doorway to some lumber closet; and, if by accident the unconscious visitor should chance to stray through the dismal portal, his first impulse would be immediately to retire, under the impression that he would be intruding into the place for the receptacle of ladies' shawls, &c.,—an impression which was confirmed on the occasion of our visit by our seeing two female attendants receiving the attentions of a policeman, several cloaks, mantles, &c., being thrown carelessly over the railings which we subsequently discovered led to the staircase up which it was our then business to proceed. Let not our readers imagine, however, that although we had attained to the gate of this photographic paradise, it was any easy task even then to find our way, for, being under the conviction that we had stumbled upon a cloak-room we made diligent inquiry of the gallant policeman, and he directed us to some imaginary spot on the other side of the building; but, just as we were moving off, one of the female attendants corrected the policeman's mistake, and we found that we had actually to proceed up the staircase leading out of the dingy hole in the wall.

Should any of our readers determine on making the perilous ascent, we may as well help them to find the way by mentioning that the apartment is said to be in the southern tower—that if they will proceed through either the British or foreign picture galleries until they are at the junction of the two, over the central entrance in the Cromwell Road, by careful search along the wall they may find the inviting entrance we have already described. Let them proceed boldly if they can find any staircase leading upwards, particularly if it be such an one as reminds them of the ascent to the servants' bedrooms in a house of moderate pretensions. Truly the foreign exhibitors have been wise in their generation not to consent to their photographs being detached from their own particular sections; for, without exception, they have hung them not only favourably for inspection by photographers, but also in such a manner that casual visitors cannot fail to see them—a very important advantage.

We are almost of opinion that British photographers would have been better off if totally unrepresented than they now are under the treatment they have experienced at the hands of the Royal Commissioners. But this is not the whole of their grievance; for, on at length reaching the long-sought-for portion of an apartment, we at once perceived that the gentlemen under whose superintendence the hanging was supposed to have been conducted have scarcely done justice to any of the exhibitors. Mr. Bedford has, perhaps, been most fortunate in this respect—or, to phrase it more correctly, we ought perhaps to say least unfortunate; for most of his productions are kept in one mass, and are placed against a screen, where they can be inspected—that is, provided it be attempted by not more than one or, at most, two persons at a time. But the majority of the exhibitors in this department have their pictures mixed up together in the most incongruous and inextricable confusion wherever, from their being in separate frames, it has been possible to disarrange them. If we add to this that, in order to economise space, a very insufficient amount of margin has been permitted, that the pictures have been crammed together as if to pack them for a sea voyage, and that the view of them is frequently more or less intercepted by cases of apparatus, our readers may form some notion of the *advantage* of being an exhibitor at the International Exhibition.

We admit that the apartment is still in a very imperfect state of arrangement, even as intended to be; but nothing can remedy the evils of which we complain except by entirely re-hanging the collection, and then only a partial rectification of matters could be effected.

With regard to the intrinsic merits of their collection, as a whole, British photographers have no cause to be ashamed. The standard of excellence is high—pre-eminently so in landscapes.

There are certain points in which our foreign competitors surpass us; though it is very difficult to make a fair comparison when one has to make half-an-hour's journey between one set of pictures and another. There is also another consideration: the modes of treatment are sometimes very different, though neither can be said to be absolutely superior to the other.

The very incomplete and backward state of the photographic, as well as many (we had well nigh said *most*) other departments in the Exhibition, precludes the possibility of our giving anything like a detailed account of what is intended to be shown. But we do not purpose to bring our present article to a close without special mention of some of the productions displayed; and, as a matter of courtesy, we shall commence with those of our guests.

The Russian Collection is of very moderate extent, so far as at present appears, and consists chiefly of portraits, which

are, however, well executed. The northern gallery is where these are to be found.

The Norwegians show but few, principally portraits.

Amongst the Italian Photographs (chiefly to be found on the ground floor near the Roman court) are some cleverly-executed architectural subjects of very large dimensions, and they are remarkable for the ingenious manner in which the joints in the paper upon which they are printed have been concealed. This has been effected by cutting out the photographs and pasting them upon a sheet of white paper, the joints being always at the edge of some building. No attempt has been made to tone the glaring white of where the sky ought to be, so that, as art productions, they are very bad, and offensive to good taste.

We apprehend that in the Prussian Court, when displayed, there will be something worth attention in the way of greatly enlarged proofs: when we saw them but very few were suspended, many having been taken down to make room for other articles that had arrived, and the bulk of the collection was in a heap upon the floor. We obtained permission to turn a few of the frames over, and, as far as we could judge of them in that condition, it has led us to express the opinion already given. They will be hung in the south end af the western transept, on the ground floor.

From Holland, if we mistake not, there were two masses of portraits, arranged as a sort of background to a couple of pianofortes; but they were in so unfavourable a position for examination, and when we found them the light was so bad, that we were quite unable to judge of their merits.

Of the French Collection—which is far the most important of the foreign ones, numerically speaking, and probably also in other respects—we have deferred mention to the last. In its extent we should judge it to be as great as the British display. It may be found in the gallery of the French court, on the south side, and very near to the centre of the building—easily accessible from the foreign picture gallery. The collection is exceedingly well hung, the productions of each artist being collected in masses: all are fairly and distinctly visible, most of the pictures being convenient for close inspection. Indeed, in this respect the contrast between the French and British arrangement of the works is most mortifying to the latter. The quality of the pictures is also excellent, and, like that of our own collection, of a generally high standard.

We cannot forbear mentioning in detail some of the French as well as of the English productions. And, firstly, we may observe that in landscapes we may honestly affirm that England is entitled to rank highest; for not only is there is nothing in the French collection that surpasses our own—as regards landscape work—but the best of those in the French department are taken by one of our own countrymen, Mr. F. Maxwell Lyte, though, having been executed by commission for the Emperor Napoleon, they are included with the productions of his own subjects. In addition to Mr. Lyte's, there are some other fine landscape productions: for instance, a series of magnificent Egyptian views, by M. Gammas—superior, in our judgment, to those formerly taken by Mr. Frank Frith of his largest size. M. Eugène Jouet exhibits some very soft, delicate, and artistic landscapes, as also groups of fruit; and M. Jean Renaud very excellent bold landscapes, taken by the Taupenôt process. Amongst the landscape operators we must also include M. Silvy; but we do not find any works of his but such as we have before noticed in some of the Annual Exhibitions of the Photographic Society. M. Silvy also exhibits a few of his *genre* subjects, to which the same observation will apply. M. Muzet has some very graphic views.

M. Warnod has produced some very fine instantaneous sea pieces, or rather marine subjects, of considerable dimensions, for this class—consisting chiefly of vessels in full sail entering and leaving some dock or harbour. The natural skies, waves, &c., are admirably pourtrayed, and there is nothing of the sombre appearance so common with many of the "instantaneous" views.

Our countryman, Mr. Bingham, appears in the French court as an exhibitor of fine reproductions of paintings—a speciality with this artist.

M. A. Ken exhibits two or three fine panoramic views (not taken with the panoramic lens).

MM. Bisson's productions are well known already in this country, and those in the present collection are similar to, if not the same with, some we have before noticed—chiefly of high Alpine scenery.

In portraiture our French competitors treat their sitters in as different a manner from ourselves as they do their landscapes. They endeavour to infuse sentiment, or rather sentimentalism, sometimes verging on the theatrical, while an Englishman holds the latter in considerable disestimation. However, a very commonplace model is sometimes rendered less insipid by this course; and, as a rule, there is generally a good deal of the artistic about the French portraits—though not more than is the case with our best operators. But certainly in the collection at South Kensington there are fewer bad specimens exhibited. Those of M. Carjot struck us as amongst the best. Disderi has some well-executed large portraits; but they appear to us to be much indebted to the pencil for their effect. Nadar's collection contains a beautifully-executed study of a hand, both negative and positive having been produced by the illumination from the electric light.

Amongst the curiosities we notice carbon prints as well as burnt-in enamel proofs, by M. Lafon de Camarsac, that deserve attention; some variously-tinted proofs upon uranium-salted paper, by M. Charles Négre; and, lastly, a novelty, by M. Laffon, in the form of hand-screens made of white silk stretched upon a light frame, photographs being printed upon the silk itself, the pictures being positives both by reflected and transmitted light.

The British Photographs, as we have already intimated, are in a very unfavourable state for criticism: we can therefore do little more than mention the names of some of the exhibitors and a few of the subjects shown, for many, although extremely good, are old acquaintances that we have already described in our pages.

On first setting foot in the room we encounter at the top of the staircase Mr. Mayall's display, including some large and highly-interesting daguerreotypes of the Exhibition of 1851 in Hyde Park. These are not well displayed, from their position causing the light to be reflected unpleasantly from the polished surface of the plate; but they are well worthy of inspection, if only to show how much more picturesque was the *coup d'œil* on that occasion than on the present one, so far as the interior of the building is concerned. Besides portraits, coloured and plain, Mr. Mayall has also attempted something in composition of *genre* subjects. Of these, *Some of the Bye-Ways of Life, Love and Labour*, and *The Great Light Comes In at the Smallest Window*, are worth notice. *The Bridge of Sighs* is a well-intended failure.

Mr. Bedford's exquisite gems are some of them new—others we have seen before. His works are always pleasing.

Rejlander, Wilson, Mudd, Blanchard, and Robinson all exhibit some of their peculiarly excellent works; but we did not perceive any with which we were not already familiar. Of Stephen Thompson, Lyndon Smith, Wardley, and Vernon Heath we may make the same remark, with the exception of the latter, whose scenes *On the Banks of the Almond*, and *On the Turrit, Perthshire*, we have only before casually glanced at upon one occasion, at a meeting of the Photographic Society.

Mr. T. R. Williams, Mr. Hennah, and M. Claudet represent portraiture; and they do so very worthily. The latter has some enlarged specimens, but they are by no means faultless in manipulation—a fact that many would at first sight overlook in consequence of their artistic excellence.

We are at some loss to understand what is meant by a placard attached to some portrait groups photographed by Mr.

M'Glashon, the announcement being to the effect that they are "contributions towards *fine art* in photography, by D. O. Hill." We presume that Mr. Hill posed the groups which Mr. M'Glashon photographed; but how these are to be regarded as more specially conducive to *fine art* than the groups by several of our artist photographers, who are also portraitists, we cannot make out. We have seen at least as good, nay, better, groups—by which we mean more artistic ones—by Lake Price, Rejlander, Robinson, and several others.

There are amongst the landscapes several from the Amateur Photographic Association; but what can the Secretary, Mr. Melhuish, have been about when he sent in such an abomination as the frame containing the prize pictures? They are utterly spoilt by the mounting; and, if that were not enough to condemn them, the way in which they are grouped or, rather, thrown higgledy-piggledy together, would complete that consummation. Now we know the pictures to be really good ones; but nothing could withstand the depressing influence under which these works have suffered. We shall certainly counsel their being re-arranged, if possible.

Mr. Macdonald exhibits a very excellent scene in a Hampshire lane, Mr. Reeves Traer some photo-micrographs that are highly commendable, and Mr. Olley some that have been produced by a different method of illumination, and which are certainly inferior to the others.

Mr. Fox Talbot, Herr Pretsch, Colonel Sir Henry James, Mr. Ramage, and Messrs. Walker and Son show various specimens of photographs in printing ink or carbon, by their respective processes.

The last we shall mention here is a fine collection of stereographs printed on glass, by Mr. Breese, of Birmingham, several being "instantaneous" views—all excellent, but we name especially *The Sea off Eype, Bridport*, and *Sunlight after a Storm*. Of the moonlight views we only observed one that was alleged to be so, and this a rather faint picture of a white statue. We must, however, state that we had to remove a huge calico covering to get at what we did see; and, besides, the light being at the time very bad, and the stereoscope scarcely to be used, we had no fair opportunity of judging respecting the merits of the pictures, more than that the productions are certainly fine ones as a rule.

In conclusion, we must not omit to draw attention to a series of fine enlarged transparencies of the annular solar eclipse, taken by Mr. Warren De la Rue, which are not condemned to the photographic lumber attic, but may be found in the north gallery, near to the entrance, towards the dining saloon, and in close proximity to the philosophical instruments. We may safely affirm that these will be highly attractive.

Since the preceding was "in type," we have observed with pleasure that the reporter for *The Times* newspaper has stumbled upon the condemned hole in which English photography is doing penance, and thanks to his notice we may hope that some visitors will be attracted to the spot. We have no cause to be dissatisfied with his estimate of the productions, and reproduce the paragraph to which we allude from the impression of the 10th instant:—

"We mentioned yesterday, with the praise they deserved, the very fine collection of French photographs in the south gallery, though we now learn that some of the very best in this display are by English artists resident in France. Some remarkably good ones are sent by Mr. Maxwell Lyte, an amateur, whose pictures may be at once known by the words "*Lux fecit*"—a true photographer's pun on his name and art. Mr. Bingham, too, one of the best of the Paris professionals, sends some fine specimens, which go far to keep up the general excellence of the French show. There is a special class devoted to English photography in the building, which contains some of the finest specimens of the photographic art ever brought together. There was no class devoted to photography in 1851, and there was near being no exhibition of the art on this occasion, in consequence of the most unfavourable place assigned to it. As it is, the London Photographic Society have refused to exhibit, and, but for the efforts made by the most eminent photographers, the art, as regards England, would have been unrepresented altogether. The photographic collection is placed along with the class devoted to educational appliances, in a large room in the upper floor of the tower, between the English and foreign picture galleries—about the most inaccessible and unfavourable spot to which it could be banished, but to which we feel now justified in calling the attention of visitors, as containing a collection which will repay a long visit. Here are collected the finest portraits of Williams, Claudet, Watkins, and Mayall, Caldesi's copies of miniatures and cartoons, the exquisite views of Bedford, Fenton, Cundall, Downes, and White, and the fancy pieces of Robinson. Frith also sends specimens of three great views in the East, which were taken for Negretti and Zambra. Some of the best exhibitors in this class are to be found among the amateurs, of whom there are many, such as Colonel Sir Henry James, the Earl of Caithness, Lady Jocelyn, Colonel Verschoyle, Colonel Stuart Wortley, Sir A. Macdonald, &c."

THE OPENING OF THE GREAT INTERNATIONAL EXHIBITION OF 1862, FROM A PHOTOGRAPHIC POINT OF VIEW.

By Stephen Thompson.

Imagine a sea of human heads, surging and undulating in restless expectation, crested by a snowy foam of "loves of white bonnets," all new, like the bright May-day which shone down upon them. Imagine in the midst a little tower, some twenty feet high, covered with crimson baize, and looking not much unlike one of those time-honoured temples dedicated to immortal Mr. Punch and his consort, Mrs. Judy. Such were the erections, five in number, planted at various points of view by the London Stereoscopic Company, for the purpose of photographing the opening ceremony of the 1st of May, so far as such scenes in the interior of a building are capable of photographic treatment, with the present resources of the art.

It would be superfluous and unwise to attempt any verbal description of a scene upon which some of the best writers of the daily press have tried their powers. Take it for all in all, it was a spectacle not to be easily forgotten, combining with it, as it did, the dignity of a historical event. As we gazed down the nave, and above and below, at the vast assemblage, the mind wandered back to another bright May morn, now eleven years syne, and looked in vain for many a bright face which graced that still most memorable day. What an array of events have passed across the world's stage in the interim! The Russian war was begun and ended—the Crimean tragedy played out—Magenta and Solferino inscribed on history's page. Again the scene shifts to the plains of India. More of the tragic than any other phase has characterised the ever-shifting kaleidoscope of time. There is no pause in Nature: another brief interval, and again the nations meet in peaceful conclave. Here, around, on every hand, from the uttermost ends of the earth, from dry land and sea—yea, and under the sea—are spread around the world's work: that labour—cunning device—of which there is none beyond the portals of this our earthly home. How wide, too, the field embraced! The Frenchman sends his latest knick-knacks—the Esquimaux his peculiar habiliments—the Italian his loftiest inspirations—the savage of the South Pacific his weapons of war and of husbandry—the Arab of the Desert his primitive tent and richly-designed prayer cloth, fashioned as his fathers fashioned it ages before, upon which he turns his face towards Mecca at sunrise and sunset. Such exhibitions are the apotheosis of labour; and the labour here displayed is most impressive. Human labour! how vast! How much for use! how much for ornament! How much that will speedily pass away! "A vain show!" mutters the cynic. Not so. The hues will fade, the metal rust, the marble crumble, and all at last find their way to the great marine-store dealer; but the moral qualities evolved in their construction are for eternal purposes. These are but the instruments—the machinery—for the training of patience, industry, endurance, conscientiousness, prudence, untiring perseverance—the little things over which a faithful stewardship will be rewarded with one over things which do not pass away.

Of course the conditions essential to the obtaining of faultless negatives are quite opposed to the circumstances under which the photographs of the ceremony were taken. Nothing but absolute instantaneity would give a perfect picture of the excited mass of human figures, and absolute instantaneity was simply an impossibility. Nevertheless, some twenty negatives, of various degrees of excellence, were secured for the Company during the day. One of the greatest difficulties was to have a plate ready at the most opportune moments, which generally *would* occur just before or just after the sensitised plate was available.* The heat in the place erected in the nave was excessive, and adequate ventilation quite incompatible with the exclusion of light. The lenses were

* An instantaneous dry process is the great desideratum for such work.—S. T.

fogged as with a vapour of steam, so that each time before exposure they had to be polished at the last moment. Most of the negatives were taken with the full aperture of Voigtländer lenses. The whole of the negatives were developed with a strong solution of iron, and intensified with pyrogallic, after fixation.

The vibration from the music was very great, and we experienced not a little difficulty in making ourselves mentally deaf to its great excellence, by a strong effort of the will, in order to give full attention to manipulative details.

The earliest proofs were sent to her Majesty at Balmoral; another set to the Princess Frederick William of Prussia (our own Princess Royal); and a set, by particular request, to the Emperor of the Brazils. Proofs were also much sought after by the illustrated papers, for the purpose of engraving.

There can be no occasion to carry the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY through the usual after-process of washing, varnishing, &c. The day closed with heavy showers; but long after the hum of buzzing crowds had died away in the building the rain subsided, and the young May-moon stole out of a cave of clouds and shone peacefully down on turret and tower; and as the lights died out one by one into darkness, the statuary became almost spectre-like under the influence of its pale, weird light. *Diana* might be seen still reposing, *Cordelia* gathering her children around her, and *The Wrestlers* strapped together still brandishing their deadly knives.

In the open space beneath the western dome, beside the throne, the cold moonlight slept sadly upon the noble bust of one who, of all others, was not destined to see this day—who, of all others, could have best appreciated its lessons—and whose spirit, suggested by the marble lineaments of Noble, seemed lovingly to haunt the scene it should have adorned;—one whose cultivated judgment would never have permitted the flagrant violations of good taste which disfigure the arrangements, and one who, had he lived, would never have suffered such gross injustice to have been done to an art which he loved and admired.

Exhibition Gossip.

THE OPENING, AND WHAT PHOTOGRAPHY HAD TO DO THEREAT—A FIRST VISIT TO THE ENGLISH DEPARTMENT—SOLAR CAMERA PORTRAITS.

AMIDST wonders of sight and sound, the pageantry of rank and wealth, and the spectacle of a mighty multitude gathered together from all quarters of the globe, the Great International Exhibition of 1862 has been opened to the world. The petty jealousies, jobberies, and meannesses, with which even the noblest and loftiest of human undertakings seem almost necessarily associated, were all forgotten in the majestic ceremonial of that opening. In the features of its pageant much that was commonplace and even ridiculous—much that showed Dutch metal to be better appreciated than sterling gold—might undoubtedly be found; but those are not to be envied who, amid the overpowering grandeur of sentiments, vivified and strengthened by the mingling harmonies of music, poetry, and colour, could dwell on such poor things as these. Tempting, however, as such a scene must be to an enthusiastic scribe, the numerous well-written descriptions of contemporary pages forbid any indulgence in this direction, and we—that is, you and I, my dear reader—will only consider what photography had to do thereat.

Of course photography was there: where is it not? In the festivals of peace and in the carnage of the battle-field—at the inauguration of a village pump—and at the coronation ceremony of a nation new-born to liberty and power—the camera-chronicler, which cannot falsify, will of a surety be found. In five different portions of the Exhibition were stationed on the opening day five different operators—good men and true photographers were they all. This band of genuine historical artists, appointed by the Stereoscopic Company, was composed of Mr. England, Mr. Russell Sedgfield, Mr. Stephen Thompson, Mr. Taylor, and another gentleman, with their proper subordinates and assistants. A variety of negatives were secured of various degrees of excellence, but failures were not altogether unknown. Some of the pictures were instantaneous, some ought to have been instantaneous, and some were not instantaneous by any means; but they are all full of interest, and will undoubtedly be eagerly purchased in more countries and capitals than our own. But while the rich patrons of industry were thus celebrating its triumphs within the building, the common rank and file of the patronised industrious were so far like them without the building that they too were being photographed, and by as good a photographer as one need desire for the work. Mr. England within that vast unfinished house that Fowke built, and in his temporary tower of baize and wood, had greater conveniences and advantages in taking *his* great crowd than Mr. Blanchard in another unfinished house that Fowke (luckily for the landlord) did'nt build, and in his temporary tower of scaffold poles, could venture to boast about. But that the latter had *some* advantages over Mr. England will not be doubted by those who see in the photographs of the opening ceremonial how huge masses of gloomy shadow were contrasted with floods of unsubdued sunlight; and how, while one portion of the crowd could not be taken too quickly, another portion (not to be separated from the first) must have required a tolerably long exposure to get them properly out in the negative. Then, again, the unfinished building in which Mr. Blanchard found his vantage ground was filled with spectators, and their curiosity and interest could not have been of much assistance in instantaneous photography. Besides the day was hot, and the spectators were thirsty, and there was no one to cut their way through the crowd to the nearest pump, and the house had no water laid on. So the carefully-preserved and inexpressibly-valuable can of clean water which Mr. Blanchard had put so prudently aside was discovered in its secret hiding-place, and remorselessly drained of its last precious drop! Doubtless, however, there was hot, hard, anxious work on that day for all the photographers engaged in chronicling the opening ceremony.

The Exhibition being open, however, we may as well now pay it a visit and look after photography therein. We find the foreign representatives of the art-science scattered about all over the place: on the stairs ascending to some of the galleries—in the main body of the building—in the principal gallery, &c., &c. But seeking British photography proper, we soon become confused and lost in our futile search. No written notice directs you to its whereabouts—no one can inform you how to reach its lofty abiding-place. You ask a policeman where it is: he says "Yesser" first, and shakes his head despairingly immediately afterwards. At last you pounce upon a boy selling catalogues, and buy the "Industrial" one, from which you learn that Class XIV.—"Photographic Apparatus and Photography"—will be found in the central tower and gallery, north court. Then you go up the broad, decorated, and gradually-ascending staircase, leading to the magnificent abode of the happy fine arts; reaching which you look in vain for any continuation of your upward path. At length, through a low, square, primitive-looking opening, you see a very narrow, dingy staircase winding steeply up beside a distemper-coloured brick wall, and looking merely like the way to some ignoble trap-door opening out upon the roof. Seeing no other means of rising in this world, up you go, wondering where on earth it will conduct you to. Presently you are in a chaos of books and desks and globes and maps, instructive toys, and other numerous aids to early education—threading your way in and out of which, you are straight among the photographs, in company with perhaps one other unfortunate, or perhaps *two*. I must honestly confess that there really were as many as *two* people there *together* for quite *ten* minutes, when I paid it my first visit.

Some people like figures, looking upon these as the most reliable of facts. If you can't picture a building so that it may rise vividly in the imaginations of your readers, tell them how many feet it measures there, how many inches here, and what are the dimensions of the principal entrance, so shall your description be found perfectly satisfactory, and be very much admired. It is the cheapest and easiest way out of a difficulty that I am acquainted with. So I will give just a taste of figures. Counting the names of British exhibitors in the Industrial Catalogue (a very difficult task this), under the head of Class XIV., you will find them 149. About thirty exhibit apparatus, chemicals, and materials, and the rest contribute (as the Photographic Catalogue shows) in all about one thousand frames, containing portraits, views, experimental results, reproductions, composition pieces, &c., one frame frequently containing a large number of specimens. In the French we have our principal rivals, and in their department the catalogue shows us some few over a hundred contributors—of which twenty-five have sent chemicals, apparatus, &c., &c., and the remainder about five hundred frames of specimens, or more, perhaps. Austria contributes to Class XIV. ten who exhibit pictures, and two exhibitors of apparatus. Grossherzogthum Baden sends one set of photographic contributions. Bavaria has two photographers in her department (but the productions of Albert of Munich are worth a visit). Frankfort-on-Maine has one exhibitor, and so has the Grand Duchy of Hesse. Prussia shows eleven who contribute pictures, and seven who have sent apparatus, materials,

&c. The Kingdom of Saxony has sent us the contributions (worth examining) of two photographers. Wurtemberg's photography has a single representative, so has that of Mecklenburg-Schwerin. Greece has the works of two photographers to grace her classical department. Italy sends the works of six, the Netherlands those of two, and Norway those of one only. Portugal sends one poor photograph of a pen drawing. Russia boasts five photographic contributors, whose productions are worth a visit. Sweden boasts three, and Switzerland four. So much, then, for the figures only.

I now propose dealing with the pictures exhibited in the various British and foreign departments, for the purpose of comparing results and ascertaining progress. Beginning with the English department, we will, if you please, first devote our attention to the specimens of

PORTRAITURE.

Going back to the fine, large, lofty attic we were just now describing, we find the workmen busy up aloft making, as we devoutly hope, some arrangements for improving the ventilation (so great has the heat been in this room that it has been more than even some of the apparatus could safely stand), and also—as we hope no less devoutly—some alterations to subdue or diffuse the light, which glares on the glass of frames hung near the ceiling to the utter extinction of every chance of seeing pictures so situated.* A pair of small boys are shouting, for the benefit of two or three visitors to the photographic gallery—"Fortygraphy Cat'logue! sixpence each!" I purchase one and begin my examination of the portraits, sorely tempted to desert them for the landscapes; but honourably persevering in the plan I have laid down above of taking one branch of the art at a time, and examining it in connexion with each of the several foreign departments before going to another. The pictures are numbered thus:—In the Industrial Catalogue there is one number given to each contributor, with which all of his or her productions are labelled, and this number is placed in the left-hand corner of the frame, while the number under which each frame of pictures is given in the "Catalogue of the Photographs" will be found in the right-hand corner. The catalogue numbers begin at the north-west corner of the room. At the first glance it strikes one that, considering the vast number of rejected applicants, and the claims which many of these—Carrick, for instance—had to the consideration of the appointed Committee, the space has certainly been unequally and unfairly divided. Some of the contributors of frame after frame of vulgar, hard, commonplace, worked-up black and white portraits, one as like another as the scratchy mechanism of inartistic "touching" can make them—and others who fill the larger parts of screens with some hundreds of *cartes de visite* some distance below mediocrity—might surely have surrendered at least some portion of such discreditably-filled space to their rejected betters. In saying so, however, you must not lose sight of the possibility I mentioned in my last gossip about myself.

Let us take first the uncoloured solar camera enlargements. M. Claudet's specimens, although weak and spiritless enough, have been under the brush of a painter who has expended a large share of careful, judicious work upon them. At the first glance you would pass by these pictures as untouched, perhaps, but a second glance betrays the artist's brush. They are perfectly free from distortion, and their general effect is anything but unpleasant. One of the best of these productions is a vignette head of a lady, which is quite untouched, and possesses much roundness and delicacy: it is the production of Messrs. Smyth and Blanchard.

This abrupt break-off means that a note from the Publisher informs me that if my "Gossip" does not reach him by this post it will assuredly be too late. So we will resume our chat on the 1st of June. A. H. W.

* Since writing the above I have been informed that a canvas awning will be stretched over the glass of the roof.

ON THE EQUIVALENT FOCUS OF PHOTOGRAPHIC LENSES, AND ON THE ANGLE OF SUBJECTS INCLUDED.

By Thomas Grubb.

The question of "What a Lens will Cover" is one of considerable interest to photographers to have fully and impartially, as well as *usefully*, discussed. I am glad, therefore, to see a prospect of its being so treated in this Journal. It is, however, a question of by no means that simple character which may at first sight appear; and, in this stage of the discussion, I think it most desirable, as well as important, that we should understand clearly what the *interpretation* of the question *is* or *is to be*.

So far as the discussion has proceeded, it appears (with the exception of an argument on the best means of ascertaining the correct focus of a combination) to have been pretty nearly confined to the question how far an orthoscopic, triplet, or a single lens will *cover the most*. The meaning attached by each writer to the word "cover" we are left to gather from his treatment of the question; while, in this proposed *covering*—whether it be of subject or sensitised surface—*quality* is nearly ignored, and quantity only considered. In other words, the question heretofore mainly discussed has been—how far the orthoscopic, triplet, or single combination, as at present constructed by the best makers, is that which will transmit—undiminished by the margin (or setting) of the lenses—a lateral pencil subtending the greatest angle to the central (or axial) one.

The solution of such a question can be considered of practical utility only under the supposition that to each of the lenses had been given by its respective maker that aperture which would cause the entire series to give *equally distinct images with these their extreme lateral pencils*. That this is not done I infer from direct comparative observations made with the several kinds of lenses as obtained from the best makers; and therefore I am led to conclude that the determination of what a lens will cover, *irrespective of the quality* of the lateral image, is more likely to lead photographers astray than to afford them useful data, while the efforts of manufacturers are liable to be turned into a useless direction, and to the supplying lenses of increased angular covering of field—the additions so made being practically useless, though necessarily expensive.

Let it not be inferred from the foregoing that I assume that any of those who have previously made a communication on the subject would wish the question to be discussed otherwise than in a useful manner. There are, however, some matters in the way of statements which I cannot subscribe to as being correct, and to which, as tending to confuse, I shall take occasion to refer as I proceed.

Now, it must be evident to every one conversant with the subject that the question of what a lens will cover is, in the absence of an interpretation, very indefinite, and particularly so as respects the single combination.

It is also evident that the discussion has already taken the form of a question as to *what* lens will cover the *most* surface? This, if coupled with a due regard to the quality of the image, is a much more practicable, as well as useful, manner of conducting the inquiry; while a better definition of it seems to be this—What construction of lens (extant) will cover (include?) a large given angular field with the greatest distinctness? But to remove all ambiguity touching the words "cover, or include," it should be understood that either word has reference to the *subject* included, *not to the image*. I expect there can be no difference of opinion on this point, but it is well to be precise. The object of a photographer is to be able to include a large extent of subject; and the extent is, by the camera, measured by the angle which it (the object) subtends. Assume that a theodolite is placed before an object to be photographed (which we may suppose to be a building), and that the angle it subtends to the instrument is found to be say 40°; if the camera now be made to take the place of the theodolite, and that it (the camera) includes the building, it is clear that 40° are included by the camera.

The establishment of the question to be discussed upon clear premises must be highly conducive to its profitable discussion. We have next to consider the most direct and satisfactory method of obtaining that which for the present I shall call the *equivalent photographic focus* either of a lens or combination.

The method which I have long since used for this purpose has the advantage of being based on correct principles, and of being abundantly accurate and within the convenient reach of every photographer. But I shall not mention it at present, because I think that the principles on which it is based are at present, generally speaking, not understood; and for proof of this I need not travel farther than the columns of this Journal, and the incipient discussion upon the question of "what a lens will cover," and to which I shall now take the liberty of adverting.

From the circumstance of Mr. Hornby stating the nominal focus of a lens instead of the correct, where it was most important that the true focus should have been given, coupled with his subsequent explanation, viz., "that he was aware that all* (?) opticians, in estimating the focal lengths of their lenses, measure from the surface of the lens nearer to the back of the camera," I conclude that he has been given to understand that such a mode of mea-

* I am not professionally *an optician*, and Mr. Hornby may be correct here if he do not intend to include me in the category; but if he did intend it he is assuredly wrong.—T. G.

surement, while wrong, would be equally so for all kinds of lenses, and that he was *not* informed that while the "optician's" mode of measurement was very incorrect, and in favour of the triplet, it was (though nearly correct) still slightly in error against the single combination; and, consequently, that a comparison of a triplet and a single lens, *instituted under such measures*, would be *very erroneous* and *very unfair* towards the single lens.

Should Mr. Hornby try the simpler of the two methods given by the Editor for ascertaining the focus of a spectacle lens, he may find it capable of much greater precision than he has supposed. A practised eye can estimate very closely the place of least confusion, instead of being, as he supposes, lost in the mazes of aberrations.

The case of the opera-glass, adduced by Mr. Hornby, does not apply. The "range" he there alludes to is due almost entirely to the power of the human eye to bring either parallel or moderately diverging rays to a focus.

The method proposed by Mr. Hornby for ascertaining the focus has, like most others, its disadvantages. First, there is probably not one photographer in ten so circumstanced as to be able to apply it with convenience; secondly, it does not tell the focus with sufficient accuracy except the "*wall*" be at a considerable distance, and therefore be the more inconvenient. True, the quantity sought might be readily deduced, but photographers, as a class, don't like this kind of work, and *won't practise it.*

There is, however, a curious fact connected with the proposal by Mr. Hornby of this his method for ascertaining the focus, viz., that it includes a principle which he is evidently not aware of, as he *condemns the same principle* in another place by *insisting on its exclusion* from the Editor's proposed method for ascertaining the same thing, viz., the true focus. To explain: Mr. Hornby, warned perhaps by some kind friend of an enormous distortion being produced by the single lens, writes (as his objection No. 2 to the Editor's method of determining a focal length)—"The distortion produced by the spectacle lens would also be very great, and, therefore, in measuring the distance between the images of the window bars formed by it, another great error might be introduced unless care were taken to measure the *widest* distance between them." Now, that which Mr. Hornby condemns so emphatically in the Editor's method of trial *exists in full force in his own.*

I trust Mr. Hornby will take these remarks in good part, and that he will believe me when I say that I do not attribute more error to have been entertained by him than probably there is held by many others at the present time. There are atmospheres in which we can scarcely live without being affected by them. I can congratulate Mr. Hornby on being in good company; for there has been just put into my hands the last number of a contemporary periodical, wherein in a leading article there are no fewer than three errors, and on the same subject. First, the focus, as measured from the back lens to the ground-glass is stated to be "always shorter" than the true, whereas in the single combination it is a little longer. Secondly, the equivalent focus of a *compound* (triplet) is stated to be one-fourth the distance between the object and image, when these are of equal size. Now, I have long since shown in this Journal that we cannot obtain the focus of such a compound in this way. Thirdly, it is stated, that when the diameter of the circle of satisfactory definition is equal to the equivalent focus of the lens, it (the lens) then includes sixty degrees in a circular picture. Now a simple diagram will show that it would only include about *fifty-three degrees*, and that to include sixty degrees the diameter of the circle covered should be about one-sixth more, or say *seven inches nearly*, for a lens the focus of which is six inches; or, by reference to a table of sines, we may find the double tangent for thirty degrees, and a radius of six inches to be = 6·934 inches (for the diameter of circle including sixty degrees).

Perhaps Mr. Hornby will kindly inform us in his next communication how he has become "sure" that the "just *a little more*" (extent of covering) so valuable occasionally to a photographer, is got by *the use of a triplet* lens. The angle included by a triplet is as defined as that included by any other lens, and not to be increased without altering the distance of the lenses *inter se.* The single combination alone presents the power of getting the "little more," or a *great deal more*, if required, by simply approaching the stop towards the lens.

I shall conclude with a reference to Mr. Dallmeyer's last letter. A little time will now probably tell how far Mr. Wilson is more correct now than on a former occasion respecting lenses.* But what does Mr. Dallmeyer mean by the following, which seems to admit of no misunderstanding, and which I extract *verbatim* from his letter, and hope to see reprinted in large type, that those who run may read?—

"When taking a view with the single combination (no matter of what form), including an angle of about 40°, the angle of deviation or displacement of objects at the extreme margin of picture amounts to no less than 4°, and, of course, so much on each side of the axis. Those who advocate the use of single-view lenses for even larger angles would do well to remember this!!"

Now, as one of those who not only advocate but use the single view (aplanatic) lens for much greater angles than 40°, I shall certainly take Mr. Dallmeyer's advice so far as *remembering* what he has stated in the above extract; but, except he can show cause to the contrary, I shall hold it to be no more true than a previous statement of his to the effect that the triplet was quicker acting than the orthoscopic *or the single lens*, used with (their respective) stops of *equal* size, while I shall *remember it as one of the most considerable photographic blunders on record.*

* I do not dispute the fact, but I arraign the inference, except so far as it applies to the individual lenses used. Mr. Wilson, in his experiment, has evidently used a triplet constructed to include a large angle, and a single combination not constructed (or mounted) with reference to same.—T. G.

THE RESIN PROCESS.*

By Alex. Robb.

To every amateur of photography a good dry process is of great consideration—one that will combine (as Mr. Long remarked at the last meeting) simplicity, economy, and certainty. Such a process has great advantages over the wet—especially to those whose holidays (like my own) are few and far between—as it enables them to economise time, with the comfort of having little to carry. The process that I have the pleasure of bringing before you this evening is called the Resin Dry Process.

Most of you will remember reading of this process in the journals some twelve months ago, but since then it seems to have been forgotten. Why, I cannot say; for, with the little time that I have been able to give to it, it has given me as fair results as any dry process I have tried.† One advantage in its favour is its sensibility, the exposure being, compared with the tannin, as one to three, and with wet collodion about three to one.

I will now give you the manner in which I prepared my dry plates:—To ordinary negative collodion, about six months iodised, I added half a grain of a bromide and half a grain of common resin to each ounce. I tried a new collodion, but it gave me inferior results. After the resin is dissolved, settle and decant. How long the collodion will keep after being resinised I cannot say: that which I used was not more than a week old. I slightly warm a perfectly clean plate (unclean plates are a great source of failure), coat, and allow the collodion to set well. If too long before being immersed in the nitrate bath the plate becomes unequal in iodide. I allow it to remain for five minutes in a bath composed of nitrate of silver forty grains, water one ounce, and slightly acid. I then wash it well in three or four changes of water in a flat tray, drain, and dry at a moderately high temperature. The exposure in the camera is from double to three times that of wet collodion.

Before developing I run a camel's-hair pencil with spirit varnish round the edge of the plate. I notice that Mr. England recommends white wax dissolved in benzole as being better. I intend trying this, as I find sometimes that the varnish is not effective, the film being tender and apt to leave the glass in washing. I next place the plate in a dish of water for half a minute, drain, and take sufficient of developing solution—

Pyrogallic acid	2 grains,
Citric acid	2 „
Water	1 ounce—

to cover the plate, flow it over once or twice and drain back into the measure, then add one or two drops of a ten-grain nitrate of silver solution, and mix it with the glass rod. I next place the plate on a levelling-stand, flow the solution over it again, and move it backwards and forwards until the image appears, which, if rightly exposed, will be in about half-a-minute.

The full development may be completed in about fifteen minutes. If the image appear quickly, it will be necessary to weaken the developing solution and add more silver; if slowly, more of the pyrogallic and no silver, which will prevent the negative from becoming hard.

I would, however, give this caution—never to leave the plate while developing, as the formation of stains is apt to occur, which no washing will remove, and the film is too tender to allow of rubbing with cotton wool, either when wet or dry. I therefore

* Read at a meeting of the City of Glasgow and West of Scotland Photographic Society, May 1st, 1862.

† Mr. Robb cannot have been a very diligent *reader* of this Journal to make such an assertion. He has entirely overlooked the articles by Mr. Glover, Mr. Corey, and others, on the resin process.—Ed.

develop one at a time, and finish before beginning another. Gallic acid I have never tried, but intend doing so, as it may tend to keep the plates cleaner. I fix with hyposulphite of soda.

This process, I think, has the merit of simplicity, economy, and certainty. Its simplicity is that of the wet process, requiring no preservative, and with small plates up to half size no previous coating; and, for these same reasons, its economy is apparent. For certainty, I said before, that in my hands it has given me as good results as any dry process.

It has been said that discoloration of the nitrate bath will take place with resinised collodion. I have sensitised two dozen of plates in one bath, and no perceptible change has taken place; neither has it in any way interfered with it for the wet process. I would not, however, recommend a bath for the wet and dry process to be the same, as the amount of acid required for dry plates renders it a doubtful bath for wet negatives.

I should be glad to see any gentleman of experience take the process up, and be the means of bringing it to greater perfection. Its being more sensitive than other dry processes ought to be a great recommendation, and for dry plates a step in the right direction; for I have no doubt the time is not far distant when dry plates will be as sensitive as wet ones.

Had time permitted I should have tried one or two experiments with this process, such as that of development and redipping the plate in a five-grain nitrate solution for increased sensibility, and I have no doubt but that some improvement might be gained thereby.

ON THE INCONVENIENCE OF THE ACETATES IN THE PREPARATION OF POSITIVE PAPERS.*

By M. Davanne.

Some manufacturers of albumenised paper have a habit of introducing into their albumen either acetic acid or soluble acetates; or perhaps in certain kinds of fermentation, sometimes set up in the albuminous mixture, acetic is naturally formed. In all cases the presence of acetic compounds in the paper exercises an adverse influence by giving rise to the formation of needle-like crystals of acetate of silver, which remain either on the surface of the print or on the surface of the negative, and are likely in this way to bring about the loss of one or the other.

An instance of this kind recently occurred in my own experience, under circumstances which I have thought it useful to record, in order to place other photographers on their guard against a similar danger.

I have employed for some time past, without being aware of it, a paper charged with a soluble acetate: the acetate of silver thus produced remained either in the paper or in solution in the bath, and when the latter became impoverished it was filtered into a dish, and a solution of known strength, somewhat concentrated, added in order to bring it up to the required standard. Some sheets of paper were prepared upon this bath by the feeble light of the laboratory, and all the prints and negatives exposed on that day were covered with crystals and needles, which blackened on exposure to the light, and which might have caused me the loss of all my negatives, if I had not promptly remedied the evil by washing. An analysis soon convinced me that I had to do with acetate of silver: the acetic compounds could not have arisen except in the preparation of the paper. But how were they formed all in a moment in such great abundance when no sensible change had taken place in the temperature, when the bath was free from fogging, and when I had only just added a fresh quantity of solution of nitrate of silver? The very simple reason is that, contrary to what takes place among most other salts of silver, the solubility of the acetate of silver is diminished just in proportion to the degree of concentration of the nitrate of silver, and that at the moment when, to a positive bath almost saturated with acetate of silver but still not containing crystals, a more concentrated solution of nitrate of silver is added, an immediate formation of silky crystals takes place which are at once deposited on the papers.

On observing this reaction an easy remedy suggested itself:—When it is desired to restore the bath to its primitive volume and strength, dry nitrate of silver should first be added in a suitable quantity. After it is dissolved, the bath is exposed to the cold night air, and on the following morning the crystals formed are separated by filtration, after which the necessary volume of water is added. In this way a very concentrated bath is first formed, which allows the principal portion of the acetate of silver to deposit, and after the *subsequent* dilution no fear need be entertained as to its crystallisation.

* From the *Bulletin de la Societe Francaise de Photographie.*

ON A CURIOUS DISCOVERY CONNECTED WITH A "NITRATE BATH."

By R. L. Maddox, M. D.

I venture, through your indulgence, to offer the following remarks on a subject connected with both photographical and microscopical science, and trust they may not prove unacceptable to the generality of your readers. Very possibly others may have had their attention directed to the point in question, yet I am not aware of such having been published. Should you find me to be forestalled, may I beg you to append a notice of the same.

In the early part of December a twenty-ounce nitrate of silver bath, forty grains to the ounce, which had been in use during 1861, and placed for a month previous in a stoppered bottle, was returned to the bath, and set aside in a cupboard partitioned off in my working-room so as to convert it into a dark chamber. It remained unopened until the 12th of last month. The bath is of cemented glass, covered outside with asphalte varnish, and kept in a vertical wooden case with the cover shutting down to half the depth of the bath. When the solution was returned to the bath, half a sheet of white foolscap paper was first folded down on the top, and then the cover placed over it. The bottle was a perfectly clean one kept to receive the nitrate bath when filtered, or when the sides of the bath were to be cleaned. The bath, after cleaning, was always washed out finally with boiled and filtered or simply filtered fresh-caught rain water—not out of the butt. I am thus particular in these details for reasons that will appear.

Late on the afternoon of April 12th I moved the bath from the dark cupboard to the table in the room. On removing its cover, lifting off the paper, and looking along the surface of the liquid (as is my habit) to see if any scum be visible and remove the same by a little blotting paper wrapped round a strip of whalebone, I noticed on the surface numerous bright glistening points, the mass altogether in length about $1\frac{1}{4}$ inch and $\frac{3}{8}$ in width. Supposing these to be crystals, I proceeded to remove them with the blotting paper; but I could not gather them up, for they floated by and opened out on the surface. A thin piece of wood was then turned up, and with this a few of the points were lifted out. Examining these with a doublet, I found them to be insects with beautifully-curled and long straight hairs. Sixty-six were in this way taken from the surface of the solution. Not knowing exactly what to do with them, some were placed in spirit of wine and acetic acid, which happened to be at hand, and the rest in water in a test-tube. These were replaced in the dark cupboard; the others left to diffused daylight. On the first appearance they looked like very miniature fat sheep with eight legs, curled and straight feathers from the back, a long depending snout, which was always turned down in the liquid, and some with a very short tail or tubercle.



On a slip of glass they resembled a particle of fat of a dirty yellow colour, the snouts and legs of the parentals being darker and more defined than in the rest of the progeny. Sunday intervening, they were further examined on the Monday. Those in the acetic acid were all at the bottom of the tube. Their colour had altered to a darkish brown. Of those in water a few were at the bottom the rest floating on its surface. None were found in the stoppered bottle, which had also been kept in the dark, wrapped in paper.

A few were now mounted in a cell with a little alcohol and water, and placed under the compound microscope, but I could not discern their general structure. They appeared to be covered with a granular deposit. Concluding this to be some silver compound entangled at the surface, it became a question how to remove it. At first washing with water and a fine sable pencil was tried; but the insects got so injured, and were so exceedingly tender, that this plan was set aside, and they were soaked for a short time in a solution of cyanide of potassium. This quickly cleared off the deposit and also seemed to abrade or break up the substance of body; for they became more tender, so that I could not keep the form at all perfect under the slightest pressure. Alcohol mixed with the

cyanide solution answered no better. Others were now placed in a solution of iodine in iodide of potassium. This turned them yellow; and, on being replaced in a watch-glass with a little water, gave a well-marked precipitate of iodide of silver. They were now removed to a solution of hyposulphite of soda. By alternately treating them to these baths, and finally washing, the general structure was rendered very visible under the microscope, though still very fatty in appearance. Wishing to preserve some of the specimens, I proceeded to put them upon the usual slides—first trying washing in spirits of wine, then drying, soaking in turpentine, and setting up in Canada balsam diluted with benzole. I could not set them out in this, as the parts gave way very readily from the tenacity of the balsam, and portions were rendered too transparent. Others were first cleared of the deposit, soaked in glycerine and camphor water, and finally mounted in the glycerine and gelatine *medium;* this proved the most successful, though I found that they still so retained their fatty quality that I dared not use sufficient pressure to flatten out their rotund bodies, ere the skin gave way. They gave me considerable trouble, although long accustomed to put up objects of various kinds. Further observation led to the opinion of their being *Acari*, though not like any I was acquainted with.

The insects are very visible to the unaided eye, being a little larger than the cheese mite. They are variable in size. The sexes are evident, the females being provided with a curious short protuberance or tubercle at the end of the abdomen, nearer the dorsal surface; and at a slight distance from it, on the under surface, when seen sideways, are two thin projecting flaps which meet at the free edges, thus forming a sort of deep and long triangular space, sack, or groove, protected at the anterior entrance with a few short crossing hairs. Looking down on this structure it has an elliptical form: the edge of each flap has from four to six reddish marks—query glands or hooklets of apposition. (*Vide* pencil sketch) In this pouch I was fortunate enough to find a body suspended, which I considered to be an extruded ovum (*vide* photograph No. 1 *a*). Pressure in several cases, especially after the cyanide solution, forced out larger ova or ovisacs through the same groove. The ova or ovisacs in some were eight in number: in others I could find only six (in one of the photographs, No. 3, four are easily distinguished). The males are rather smaller than the females—no projecting tubercle, no groove nor pouch. In some I found a very curious structure visible only from the abdominal surface, but the exact plane of which, even by the most careful focussing, I could not decide on, as it was only seen when the two surfaces were closely pressed. It was oval in shape, with a slight projecting limb from the upper part of the oval on each side. In the centre of the ellipse was a well-defined line, and, abutting against this, on each side, short, slightly-curved marks or lines, looking somewhat like the gizzard teeth of some insects; but whether it belonged to the digestive or genital system I could not satisfy myself. Many attempts were made by pressure to separate these parts, but yielded no good result, the whole breaking up into a sort of fatty sarcode. The outer surface of the skin is covered with minute granulations, which, seen edgeways, are resolved into very minute points—not *cilia*, being much shorter and stouter. The long curled hairs on the back, and the straight ones near the posterior end of the body, are finely barbed or feathered. The insects are provided with a pair of terrible, strong-looking mandibles, each composed of two claws with irregular teeth, four or five that interlock. The labia are notched at the end like a small reversed ∧ set in a larger V (*vide* photograph No. 4). The legs are furnished with sharp bristles, the ends of the foot padded, and on some of the feet I noticed a sort of short rod with a knob at the end. No eye spots were visible.

This description of the insects is very imperfect. I had purposed to have enclosed a drawing, with measurements, &c., but severe indisposition has disappointed me in the attempt, which the accompanying miserable photo-micrographs must replace. Of their life-history I know nothing, nor do I attempt to advance a theory of how they came into the bath. After the strange incidents met with by the late Mr. Cross, the celebrated electrician, of the Quantock Hills, when forming crystals by the agency of his small but numerous-celled water battery, we may well pause before the portal of creative power, without bringing to our aid equivocal or spontaneous generation, as some of the critics of his labours ventured unreasonably to apply to him. No doubt the ova were there in the exact conditions to furnish forth their dormant energy, though strange to us may seem those conditions:—the liquid a solution of a caustic salt capable of seriously injuring animal membranes, at least in ourselves; the light *nil* or non-actinic; the creatures themselves highly organised, yet not high in the scale—a genus of *Arachnidæ*. Few, I think, would look for animal life in their nitrate baths; yet these remarks may, if of no further use, now call the attention of photographers to the fact of its supporting living organisms, even to fatness, and elicit perhaps more of their history and structure.

As a plea for the poverty of the prints, I had nothing at hand but very old paper to print on. The day of taking the negatives was most tantalising: sunshine by fits, with a plenitude of rain, and those fits only of a few seconds' duration. In fact, everything had to be tempered with much patience. The apparatus, extemporised for the purpose, had its defects; the small plates were, by a modified "dry process," prepared for other purposes. Of the eight taken, enclosed are prints from six: the other two—one of a crushed insect, and a repetition of the plate with two insects—I do not send.

Bearing on the subject of life in strange places and curious conditions, and enjoying what we deem poisons, is a short remark in the 3rd number of the *Popular Science Review* for this month—Mr. Attfield having found *Acari* nourishing themselves on extract of nux vomica, and even feasting on strychnine. In the article "*Acarus*" *(Microscopic Dictionary)* I cannot find among the described species any that exactly correspond with these. The projection or tubercle, at the end of the body, is named in the *Acarus hippopodos*, found on the ulcer-crusts of horses' legs, but the curious pouch-groove I do not see noticed. If new, perhaps you may venture to be sponsor, for I feel too uncertain about the baptismal registry of others to propose a name. The microscope used for the observations was Smith, Beck, and Beck's, with objectives two-third and one-fifth: for the photographs their one-fifth, and an achromatic of lower power of my own making. The micro-camera was put together with an old microscope, Abraham's achromatic prism for a mirror, a Coddington lens (which, by the way, was fractured across the groove entirely through the glass) as a condenser, and a small pocket camera for the sensitive dry-plate. Therefore, you will please not criticise the prints, as they are but rude specimens, and not examples, of what can be done with care in photo-micrography.

[Although Dr. Maddox speaks disparagingly of his photographs, they are excellent illustrations of the *Acari* discovered by him in so singular a habitat. So good are they in the essential points that no woodcut, however excellent, could possibly do them anything like justice. We have therefore attempted but one, just to give our readers some notion of the form of these curious strangers, the details displayed by the microscope and recorded in some of the more enlarged photographs being incapable of reproduction in our pages. We shall take an opportunity of exhibiting the photographs themselves at some of the meetings of the Photographic Societies.—Ed.]

ON THE STUDY OF THE ELECTRIC SPARK BY THE AID OF PHOTOGRAPHY.*

By Prof. Ogden N. Rood, of Troy, N.Y.

Photographic images of the electric spark between the carbon electrodes of the voltaic pile were obtained on silver plates in November, 1840, by Prof. B. Silliman, jun., and Dr. W. H. Goode. These observers remarked the greater actinic activity of the negative spark as compared with the light from the positive electrode, which I believe is the earliest recorded observation on this point. These authors also noticed a double concentric structure in the impression from the electric spark similar to that described in this paper.

Photographs of the stratification and luminous discharges in Geisler's tubes were obtained in the spring of 1860 by Professor W. B. Rogers, of Boston, operating with one of Ritchie's coils. These results were communicated to the British Association at their Oxford meeting in June, 1860.

Similar photographs were obtained by Gunther and Dove, and presented by the latter to the Prussian Academy, on the 27th of May, 1861. A photographic camera was employed, and an exposure of from 3⅓ to 6 minutes.† In the same number of Poggendorff's Journal, W. Feddersen, in a highly interesting article on the electric discharge from the Leyden jar, states that, by means of a concave mirror silvered according to Liebig's process, he obtained fine photographs of the electric spark, even when the mirror was in rapid rotation. Photographs of the spectra from the spark of Ruhmkorff's coil have also been obtained by Prof. W. A. Miller.

* From the *American Journal of Science and Art.*

† Pogg. Annalen, vol. cxiii., No. vii.

In all these cases the electric line was photographed from a position at right angles to its motion, a side view being obtained. My object in the present article is to describe a very simple and easy method of obtaining remarkably fine photographs of the electric spark from a point of view parallel to the direction of its motion, the pictures being as it were transverse sections of the spark and of the electric brush in all its variety. The very short duration of the electrical discharge renders its study by ordinary means difficult and uncertain: while photography, by revealing a mass of new details otherwise invisible, and furnishing a permanent record, which can be studied at leisure, offers advantages that cannot be too highly estimated.

Method Employed.—M. E. Becquerel showed, several years ago, that paper coated with the bromide of silver is sensitive to the light of the electric spark; the discharge of a battery of four Leyden jars in its immediate neighbourhood causing a slight darkening. When a single spark was allowed to strike the paper no effect was produced.*

In experiments on instantaneous photography with the wet collodion process, I was often encountered by the well-known fact that, while those portions of the sensitive surface which had been acted on by a very bright light darkened strongly under the developing solution, adjacent parts, where the action of the light had been somewhat feebler, remained quite transparent and free from a deposit of silver. This rendered it probable to me that if the electric spark were made to strike directly on the sensitive surface, only those portions would be affected which were in immediate contact with the luminous atmosphere. Actual experiment confirmed this idea to a most surprising degree. When a single spark was allowed to fall on the sensitive surface, under the action of the developing solution, a fine, intense, and sharply-defined image, full of delicate details, was produced. The sharpness and perfection of these images was such that they bore examination by the microscope under a power of 40 diameters, while there was not the least difficulty in enlarging them by means of photography as high as 20 diameters. The enlarged negatives then furnished good prints on paper. Sometimes the small original images were accompanied by an irregular partial halo caused by the diffused light of the spark, but this for the most part was so faint as in no way to interfere with the distinctness of their outline.

The question naturally arises whether these delicate and beautiful images are produced by the action of the *light* on the sensitive plate, or are owing to a decomposition of the silver salt by electrical agency: in other words, whether these pictures are photographs or electrographs. That they are due to the action of light the following experiments will render probable.

(1.) Sparks were allowed to fall on sensitive plates, and their form was observed by the aid of a lens of one inch focal length: on developing the latent images they corresponded in shape with those observed.

(2.) A glass plate was coated with plain collodion, free from iodide or bromide, and allowed to remain five minutes in the bath of nitrate of silver. It was then removed, and single sparks were allowed to fall on different portions of the wet collodion surface. Under the action of the developer the well-known spark images appeared.

A simple clean glass plate without any coating at all was placed in the nitrate bath for a few seconds. On its removal, and while still quite wet, sparks were discharged on different portions of its surface. When the sulphate of iron developing solution was poured over it, as usual, clear sharp images of the spark were obtained!

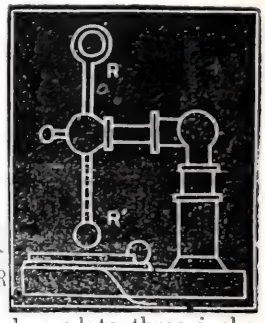
As plain collodion, free from iodide and bromide, as well as simple glass plates moistened merely by the nitrate bath, have not been considered by photographers as sensitive to light, these unexpected results rendered it probable that the electrical discharge produced a decomposition of the nitrate of silver. I was, however, enabled to prove that these surfaces really are sensitive to *light*, in the following manner:—A plate coated with collodion, free from iodide or bromide, but saturated with a solution of nitrate of silver from the bath, was placed in a camera which was directed towards a window with a bright sky beyond. The lens used was the "portrait combination," its focal length being six inches, with an aperture of 1½ inches: the exposure lasted ten minutes, the full aperture being used. Under the sulphate of iron solution, a distinct image of the window, of no great intensity, was obtained. Next, sunlight was concentrated by a "bull's-eye" condenser on a little stand, which to avoid too great heat was arranged so that its surface was about half-way between the lens and its focus, the bright spot on the stand covering an oval space ⅔ of an inch in diameter and two inches long. A plate merely moistened by immersion in the nitrate bath was placed on the stand for ten seconds, and then developed by the sulphate of iron solution, which brought out an intense image of the oval spot.

(3.) The image of the positive spark falling on a plate merely wet with nitrate of silver has a peculiar and definite form. If this form is really traced by *light* we should expect that the light would be able to act on another sensitive plate placed directly under and in contact with the first. This was found to be the case. A glass plate coated with sensitive collodion, on its removal from the nitrate bath, was covered with a piece of the very thin glass used for microscopic purposes, the latter having previously been moistened by a solution of nitrate of silver: sparks were then discharged on the covering plate of thin glass. When the latter was removed and the collodion surface developed as usual, images of the spark were obtained. The definition was much impaired, and the intensity lessened. When the thin glass was blackened so as not to transmit light, and the experiment repeated, no images were produced, not even by allowing a large number of sparks to strike the same spot.

Apparatus for the Production of the Photographs.—For the generation of the electricity a small cylinder machine was used. The diameter of the cylinder was seven inches, its length ten inches: the prime conductor exposed a surface of 200 square inches.

The apparatus for throwing the spark on the sensitive plate is seen in the diagram A brass rod R R′, terminated by a freshly polished brass ball six-tenths of an inch in diameter, is supported over the centre of the sensitive plate and insulated in the manner seen in the woodcut (*fig.* 1). The rod is graduated and held in position by a binding screw. The sensitive plate is supported on a silver disc, which is in metallic connexion with the rubber of the machine. A weak spring of platinum foil rests on the collodion film and connects it with the silver disc. R is connected with the prime conductor.

FIG. 1.



The manipulation was as follows:—A glass plate three inches square was carefully cleaned, coated with collodion, and sensitised in a bath of nitrate of silver of 40 grains to the ounce of water. The plate on being taken from the bath was held in an upright position, so that it could *drain* for one or two minutes: it was then placed on the stand, and the machine very slowly turned, until an apparently single discharge had been effected, when the plate was removed about three-tenths of an inch, and the operation repeated until twenty sparks had fallen upon it. The plate was then developed and fixed as usual. After each experiment the brass ball was wiped to remove dust, &c.

The pictures produced in this way are apt to be too intense, whereby the interior details are often unobscured. Some care must therefore be taken in the selection of a collodion: that which is suitable for "ambrotypes" is to be preferred. The following formula answered well in my hands:—

Plain collodion.....	8 ounces.
Iodide of potassium	40 grains.
Bromide of ammonium.....	20 do.

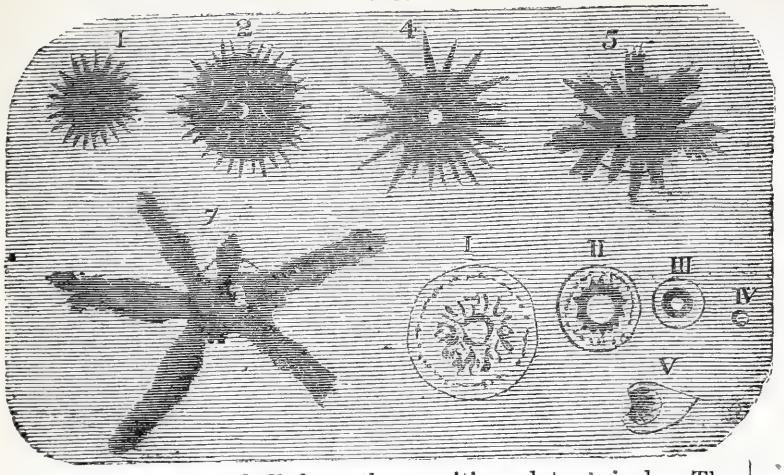
This collodion should be used while still new, as it then is sensitive and not too intense in its action.

Form of the Positive Spark when Drawn from the Prime Conductor by a Short Thick Metallic Rod.

The positive electrical spark under these circumstances consists of a combination of two figures, viz., a star and one or more rings. The relation which they hold to each other is modified by the distance the spark travels in the air; that is, by the tension of the electricity. The two figures are usually arranged with a considerable degree of symmetry. The very marked difference in these two components, and the fact that the annular form is, as I shall show, characteristic of the electrical brush, seems to indicate that each simple spark consists of two or more successive discharges of different intensity. The woodcuts showing the forms of the spark were executed from photographs enlarged nine diameters; in them the bright portions of the spark are of course represented by dark shading, &c.

† Pogg. Annl., vol. liv., p. 54.

FIG. 2.



Distance of the brass ball from the sensitive plate $\frac{1}{10}$-inch. The most general form is that seen in diagram 2, at .1. The starlike figure is very distinct. One of the rings is included within its area, and faintly indicated by a deeper shade: the other ring is sometimes seen circumscribing it.

$\frac{3}{10}$ .2. The rays are larger and the external ring is plainly visible.

$\frac{3}{10}$ and $\frac{4}{10}$. .4. The rays increase in size, and the ring is well developed.

$\frac{4}{10}$. Like the above, except that the rays begin to grow irregular.

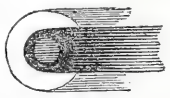
$\frac{6}{10}$. Rays quite irregular: both rings distinctly visible.

$\frac{7}{10}$, $\frac{8}{10}$, $\frac{9}{10}$, $1\frac{1}{10}$, $1\frac{2}{10}$. The star loses its regularity, and the rings are no longer symmetrically disposed.

$1\frac{3}{10}$. No spark passes over: it is replaced by the electrical brush, or rather by discharges intermediate between the brush and the true spark, *fig.* 2, I.

These produce a strong impression on the plate, and yield intense sharp figures, consisting of three parts:—An external sharply-defined circle, within a series of dots arranged in a circle; and finally, innermost of all, a broad ring which may pass by delicate gradations into a star. This would indicate that the partial spark consists, under these circumstances, of at least three successive discharges of electricity of different tension. The circles on the plate seem to have exactly the same diameter they possess in the air. This is strongly suggested by the following experiment:—If the plate is held obliquely the partial sparks generally pass near its surfaces for some little distance before actually coming in contact with it, and their path is marked by comet-like tails (see *fig.* 3). The diameter of these tails is the same with that of the circles. This is also true of the brush.

FIG. 3.



Electrical Brush.—When owing to distance or the use of a pointed wire these partial sparks become reduced in intensity we have the electrical brush: its form is slightly removed from the last. The middle circle of dots vanishes as well as the projections from the broad inner ring; and we have two concentric rings, the smaller one being most strongly marked. If the brush be still further reduced in intensity, the external circle becomes very faint, and finally disappears, and but a single circle is left.—*Fig.* 2, III, IV.

Electricians have long since arrived at the conclusion that the electrical spark passes by insensible gradations into the electrical brush, and I find that photography furnishes a beautiful confirmation of this view. Thus the figures I, II, III, IV, *Fig.* 2, are selected from photographs forming the first members of a series which would illustrate the gradual conversion of one of these forms into the other, and the other members could easily be added.

We have seen that while the electrical brush is characterised by the annular form, electricity of higher tension generates star-like figures, the rays being larger in proportion to the tension up to a certain point. Now the constant occurrence of a combination of these two forms, in the photographs of *bright sparks*, points out, I think, clearly, that these sparks consist also of more than one discharge; moreover, the ring, where it cuts the rays of the star, can often be traced under them, as though superposition had taken place. Again, when the bright spark travels some distance the ring is generally not symmetrically placed, as though the discharge producing it had followed a slightly different path. Indications are constantly observed which lead to the idea that even the star itself is produced by the overlapping of two stars, having rays of different size and different intensity.

The wet collodion film offers, of course, a certain amount of resistance to the passage of electricity over its surface, and thus furnishes us with the different indications above described.

Finally, as the researches of Riess, Kirchhoff, Helmholtz, and Feddersen, have shown that the electrical discharge is oscillatory and wave-like, I am the more inclined to regard these photographic figures as produced by a series of consecutive discharges of different intensity.

Before passing on to the next point of interest, I will allude to a curious modification which the positive partial spark undergoes if the machine be turned rapidly, so that a large number of them fall quickly on the same spot: see V, *fig.* 2. Many of the partial sparks are arranged radially around the point under the brass ball, the pointed portion being turned outward.

(To be concluded in our next.)

WHERE TO GO WITH THE CAMERA.

By Our Own Pioneer.

ROUND ABOUT THE CORNISH COAST.

There are few districts that afford more scope or offer such temptations to the photographer as the "*Rocky Land of Strangers*"—such being the name given to the county of Cornwall by John Norden, the "chronicler," of 1586, of whom his rivals said—"*He wrote* much not to be depended on or *found elsewhere.*" The term "Land of Strangers" probably referred to the Jews, who were working the tin and copper mines; and some writers of the same period have said—"Where silver or copper is found to be, there for certain a Jew you will see." However, of this it is certain, were its beauties and capabilities half so generally known as they ought to be, it would be pretty extensively visited by photographers; for its magnificent headlands, bold and wave-lashed bluffs, sea-worn caves, extensive sands, deep and silvery bays, magnificent slopes, and jutting crags, are not to be excelled, and, in many instances, not to be rivalled, on any other part of the English coast; while to these may be added an unlimited series of pictorial beauties in graceful landscape, bold and broadly-defined church towers, quaint old bartons and mansions, stone and timber bridges, and other artistic "bits" well adapted for the "pencil of light," and forming (as the playbills would say) "*a combination of unparalleled attractions.*" And now, from the increased facilities of the road and rail, this most romantic and southernmost county in England can be reached "in next to no time." Having (like the previously-named John Norden) perambulated, viewed, and delineated much of the said county, I purpose—to the best of my humble ability—pointing out to artists and amateurs, and pioneering them to places of note, remarkable scenes, and such objects of interest as may be adapted for photographing and sketching—pointing out how they may be reached, and where the best accommodation may be obtained.

All intending visitors from the south should make for Exeter, by way of Bristol, or by the South-western line through Honiton (the land of "bridal lace"), the said South-western line conveying passengers from London to Exeter for 14s. 3½d., being nearer than the Bristol line by twenty-three miles. From Exeter the line goes on to Plymouth—then to Bodmin, where you can 'bus it to all parts of the Cornish coast; or, should the tourist prefer stopping a day or so at Exeter and have a look round the "ever faithful city," he can then go on by omnibus to Launceston, and from thence to any part of the coast desirable.

Twice a week conveyances go from Launceston to Camelford, which would be a good place to fix upon as a central station, visiting in succession Tintagel, Boscastle, St. Teath, St. Breward, Trevalga, Port Isaac, and the far-famed quarries of Bowithick and De la Bole; while the towering crags and spray-dashed peaks of the rock-bound coast—the "home and haunt of the wild sea mew"—are all within easy and convenient distances.

Camelford—from Cam-allan, the crooked river—was a place of note and notoriety previous to the Reform Act, which, to a great extent, as "commercials" say, "shut it up." The inns and temperance coffee-house offer good accommodation, while at the stationers' and printers' every information can be obtained as to the places of note in the district; and if Sir Rowland Hill would like to see a *clean, respectable,* and good-looking post-office, he had better *post* down to Camelford. A *prestige* hangs over the old borough of by-gone days, as being the first place for which Lord Brougham sat in the Commons House of Parliament, and as contiguous to the spot (Slaughter Bridge by name) where King Arthur, of round-table fame, received his death-wound.

A silver gilt mace, used by the Mayors of Camelford in their glorious days of bribery and beer, much defaced and battered, whether from knocking down refractory free members, or repeated callings to order by thumps on the table, or pure accident, is not known. It is remarkably well chased and engraved, of handsome elegant porportions. It remains with some curious documents, in the care of the Town-Clerk, and is well worth the inspection of the antiquary. Some have surmised that the chasing,

gilding, and carving of the royal arms, and heraldic national devices, was the "cunninge worke" of Elias Gamble, the master of William Hogarth: it is evidently of an earlier period than the date engraved on it.

Camelford from the high ground on the left of the turnpike; the old ivy hall, by the bridge; the old school, from the green; Rough Tor and Brown Willy in the distance; with sundry old cottages, and gable-end houses in nooks and corners, form broad, bold, and effective objects for the single lens, or for stereoscopic effect. Leaving the town by the Bodmin road, and taking the lane on the left, short round by the turnpike, you come to the Church of Advent, or St. Alhawyn. This makes a good picture from each side, the lofty and peculiar tower standing out in bold and strong relief. Leaving the church and following the cross lane to the Bodmin high road, the "old stone steppes," and gap of the "*Camel*-ford" in the river course at the flat of the hollow of the hill, will give two good pictures: that to the right, towards Camelford, of an old mill, water leap, and broken wooded background; while that to the left gives the far-famed rocky mounds and dashing falls of rushing water, known as the "Devil's Jump." This grandly wild and Der-Frieschutz-looking bit of Cornish scenery—immense masses of large-grained granite mixed with the porphyritic—rise in wild confusion on each side of a deep ravine; while huge masses of felspar and quartz break the rushing of the wild and bounding flow of water, as it tumbles headlong into the dreary waste of marsh and bog, where lies concealed the junction of the granite with the slate. Now, from one of the granite-bound sides of this wild ravine to the other, his Satanic Majesty was said to jump—performing, in fact, the feat of the double trapez, and, therefore, depriving Leotard or Blondin of any claim to originality in that daring act. Passing on to the Bodmin road, a couple of miles will bring you to the "Leather Bottle," when the turn to the right will lead to Michaelstow Church Town, the tower and steps from the village green making an admirable picture—the distinctive feature of most of the Cornish churches being the open space around them, so that the camera can be planted near or distant, according to the wish of the operator; while the proximity of a cottage or two, and the general civility of the inhabitants, render any assistance or a supply of water for the wet process easily obtainable. Retracing the road to the "Leather Bottle," a lane right before you, opposite the blacksmith's shop, leads up to St. Breward, the church founded by William, son of Lord Breward, of Oddcombe, consecrated Bishop of Exeter in 1224. The road to St. Breward from the "Leather Bottle" presents many excellent subjects—an old bridge from the ford of the river, with the mine gearing and engine shaft in the distance; an old mill and water course, with the rough boulders and granite crags; and Brown Willy, 1368 feet above the level of the sea, forming the extreme background. The rise at the highest winding of the road brings you to one of those wild and exquisite "bits" that reminds you at once of some of the Continental sketches in the old landscape annuals of thirty years back, when Turner, Harding, Bonnington, and Prout were in full sway.

Looking to the right, the eye wanders over Advent, with its graceful and conspicuous church tower—Camelford and the De la Bole Quarry, to the middle distance below, in conjunction with Lanteglos, St. Teath, and Endellion, filling up the left. Ascend the crest of the hill to the Church Town, when you come upon the mine with its imposing and picturesque array of machinery, windlass and shaft, engine-house, timber, watercourses, stone supports, chains, props, ropes, blocks, and tackle. These, as they seem mingled in endless confusion, make admirable and distinctive pictures. The church tower is a fine specimen of bold rough granite work, while its situation close to the high road, with a bank in front where the camera can be placed, offers every facility for a first-rate view. There are two good inns in the village, and several excellent subjects may be obtained round the church tower and rectory. Returning to Camelford, about a mile from the town on the road to St. Teath, you come to a turn or bend which brings the tower of the church of Lanteglos from out the centre of a fine group of trees—the low dwarfed wall of heavy masonry, the rustic gate, and tangled leafy hedge to the right and left, making up a good foreground. Following the road to the church gate, and ascending the hill on the left, a fine effective picture of the church and rectory may be taken—the old familiar distances of Rough Tor and Brown Willy filling up the back. Following the lane for half-a-mile a gate in the corner of a hedge-row will open up a view of the long straight slate heaps from the De la Bole Quarry: these with the straggling and irregular dottings of cottage sand houses on the crest line of the horizon, with the large white building called Quarry House—the chimney shaft of the engine, sloping banks, and low hedge-rows—will give a good and telling subject. Three miles from Camelford, on the Wadebridge Road, is St. Teath. At the turn of the new road and up the vale some splendid landscape bits may be obtained; and at the Inn, by St. Kew church tower, civility and good accommodation is found. St. Teath itself and St. Teath church tower will bear taking from several points. Here, as in most other parts of the Cornish district, a multitude of effective little bits will present themselves on every side to the eye of the artist, and are so exceedingly numerous that it is impossible to indicate them all; many of the places being named after saints, martyrs, and confessors, who led the life of hermits in Cornwall and Devon, and are fully described in the writings of Giraldus Cambrensis and William of Worcester.

Leaving Camelford by the upper road, rounding the "Sportsman Inn, by John Coumbe," and passing the "union," a couple of miles will bring you to the higher side of the celebrated De la Bole Quarries, an immense excavation in the solid stone, some 350 yards long by above 100 in width, and worked to the depth of some 300 feet. The slate procured is of different quality, according to the depth of excavation: it is divided and subdivided with great expertness by the quarrymen into pieces of suitable size and thickness for roofing and other purposes. This excavated "hive of living industry" is a magnificent sight, and a great variety of interesting pictures may be taken from various points. Permission to do so may be obtained from the resident superintendent at the quarry house. About two miles further on the Boscastle road, a directing board points the way to the "Bowithick Quarries"—of more interest, perhaps, to the photographer than De la Bole, from less liability to interruption, and views being obtained of greater variety and extent. There is an abandoned quarry on the right of the road, with the massive frame-work and machinery overhanging the pit now filled up, and with water, while the sides in many places are darkened and tinted to various hues by the trickling stream pouring down the sides to the depths below. In other parts there are immense blocks of granite, rising to a height of 100 feet or more, and in many instances presenting bare overhanging blocks and longitudinal sections of 20 to 30 feet. These, with the stunted furze growing on and overhanging the tops and points, while the close-creeping ivy clings gracefully to many parts of the rocky *faciæ*, will give in breadth, boldness, and shadow, pictures with all the force and solidity of Salvator. Five or six different views may be taken of various parts of these gigantic specimens of human skill, enterprise, and toil.

At Trebarmouth, close to these quarries, a small and clean inn affords good accommodation, and several views of the slopes and headlands towards the North Atlantic, may be here obtained—Padstow Point and Newland being within view. It is scarcely possible for a written description to convey an idea of the innumerable points in, round, and about this district. On one side you have an immense hill of slate and granite piled up layer upon layer, with a solitary cottage or hut erected in the midway or on the top. Turn a short distance, and you have immense boulders of granite twenty to forty feet square, overhanging, perhaps, some abandoned pit; while a move a few feet right or left may give you a magnificent bluff, with irregular slopes coming down to the very edge of some immense gully; while in some of the lower portions, under and around the village of Pengelly, the refuse of the quarries is so lavishly piled around, and in such immense quantities, that the spectator might be led to imagine he was viewing the field of the battle of slates after the engagement. For stereoscopic purposes, I believe many of the subjects are not to be met with elsewhere—having the advantage I have before mentioned, that you can place the camera near or distant, and in many instances get a good position on a level with the subject, half-way up, or above; and this, I need not repeat, is a convenience not often to be met with. Four miles from this is the renowned Tintagel, Dundagel, or Bosithney—a place about which an immense amount of fiction has been engrafted on a very small amount of fact. Joseph of Exeter, a priest of the "City of the Red Earth," and who went with King Richard to the Holy Land, as a sort of "own correspondent," and made on his return Archbishop of Bordeaux, says:—

> "From this blest place immortal Arthur sprung,
> Whose wond'rous deeds shall be for ever sung—
> Sweet music to the ear, sweet honey to the tongue."

From which it is evident Priest Joseph had heard of old Merlin's prophecy, the said Merlin being "your dashing firebold man" of that age. The church, castle, island, and waterfall are the great objects of interest. The church, from the open space around and proximity to the cliffs, makes a good object from various points and sundry distances. For near views the massive tower, old Saxon chapel, and Norman doorways present themselves; while in various panoramic views it can be included as a prominent and telling object. In the interior will be found the Saxon chapel-founder's tomb, piscina, carved screen, font, and interesting specimens of the Anglo-Saxon style of architecture, with some carved "standards" or seat ends. It has been restored, and stained-glass windows introduced, designed and executed by the vicar, an artist and antiquary of much taste.

Arthur's Castle—sometimes termed "Dundagel," the Castle of Deceit—is the great "go" of the district. The King himself, like Philip Quarle's monkey, lived such a long time ago that many doubt if he ever lived at all; but the castle is certainly a most extensive specimen of rock, ruin, and romance, and must be seen to be duly appreciated. If the panoramic lens and camera were brought to bear upon it, some photographic marvels might be produced: however, with the ordinary instrument, good stereoscopic and other pictures can be obtained. In the village, several old houses offer themselves as well worthy the artist's notice and attention. Two good inns and several private houses offer accommodation for visitors, while the key of the "island gate," or detached citadel of the old castle, can be found at the Mill Cottage.

COURT OF EXCHEQUER.

(Sittings in Banco before the Lord Chief Baron, *Mr. Baron* Martin, *Mr. Baron* Bramwell, *and Mr. Baron* Wilde.)

MAYALL *v.* HIGBY.

This case was tried before the Lord Chief Baron at Guildhall, when a verdict was found for the plaintiff, leave being reserved to the defendant to move.—The case was again before the Court on Tuesday, the 6th inst.

The declaration alleged that the defendant had wrongfully taken and kept possession of certain photographic portraits of eminent persons, belonging to the plaintiff, and copied them and sold them, and thereby depreciated the value to the plaintiff of the originals, and the declaration also claimed an injunction to restrain the defendant. The second count was in detenue.

The plaintiff and defendant are photographic artists. The former some time past lent to Mr. Tallis, late proprietor of the *Illustrated News of the World*, a considerable number of photographic portraits of the celebrities of the day for the purpose of having them engraved and published with that paper. Tallis became bankrupt, and the messenger of the Court sold the photographs to the defendant, who took reduced copies of them and sold them.

Mr. M. Smith, Q.C., moved for, in pursuance of leave reserved and obtained, a rule to set aside the verdict and enter it for the defendant, on the ground that the right alleged and the right to the injunction were not proved.

Mr. V. Williams, in showing cause against the rule, said:—No question of copyright, either at common law or by statute, arises here. The plaintiff complains that his right of property in the photographs has been interfered with without his consent. That right has been defined to be *jus utendi et fruendi*. The defendant, getting possession of the portraits wrongfully as against the plaintiff, had multiplied copies of them in a reduced form and afterwards sold them. He had obtained from a Mr. Bennett £100 for some, and it was quite clear that the plaintiff's property is depreciated in value in exact proportion to the profit made by the defendant. Those persons who had purchased copies from the defendant were not likely to purchase from the plaintiff. The latter is, therefore, entitled to substantial damages, although he has been content to take a verdict for nominal damages as sufficient to sustain the injunction granted by Baron Bramwell at chambers. Baron Parke, in "Boosey *v.* Jeffreys." the great case on copyright, 4, *House of Lords Cases*, said:—"The author of a literary composition has an undoubted right at common law to the piece of paper on which his composition is written, and to the copies which he chooses to make of it for himself or for others. If he lends a copy to another his right is not gone; if he lends it to another under an implied undertaking that he is not to part with it or publish it, he has a right to enforce that undertaking." And Lord Chief Justice Erle in the same case says:—"The author has remedies for the wrongful abstraction of copies: he may prevent publication, he may acquire back the copies wrongfully made, he may sue for damages if any are sustained." In these passages (continued Mr. V. Williams) pictures may be substituted for literary compositions, as is shown by the case of "Prince Albert *v.* Strange," 18 L. J., in which Lord Cottenham applied the same principles to the case where copies of the Queen's and Prince Albert's etchings were surreptitiously obtained, and the publication of them advertised.

Baron Bramwell.—Suppose, Mr. Williams, a man discovered some inscriptions upon stones and brought them home, could another take casts of them without his consent and publish them? By so doing the value of the stones would be greatly depreciated.

The Court then called upon

Mr. M. Smith, who argued that the plaintiff was not entitled to damages on the first count, or to an injunction, and that the plaintiff had not shown that he had the exclusive right of publishing copies of the portraits. He had lent them to Tallis for the purpose of their being engraved, and after that any one could copy and publish them.

Mr. Aspland followed on the same side, contending that the plaintiff was not entitled to an injunction to the extent prayed, as it would prevent the defendant from selling negatives which were his own property, and because the plaintiff had recovered damages in respect of that very matter.

The Court decided that although the negatives continued the defendant's property, the selling of them would be an act of injury to the plaintiff, and therefore, apart from any question of copyright, the sale of them would be actionable; therefore the injunction might issue under the 79th section of the Common Law Procedure Act, 1859. The Court also said that it might have been otherwise if the plaintiff had received full damages in respect of the sale of all the negatives, but the actual damages were nominal only in respect of the right.—Rule discharged and injunction to go.—*Times*.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at King's College, on Tuesday evening, the 6th inst.,—Peter le Neve Foster, Esq., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were balloted for and duly elected members of the Society:—Messrs. W. H. Warner, of Ross; A. B. Brown, of Gibraltar; L. Caldesi, of Pall Mall; M. Hanson, of Leeds; and J. T. Brown, Hon. Sec. of the Birmingham Photographic Society.

Mr. Glaisher exhibited a positive appearing somewhat in natural colours, taken by Dr. Diamond in 1851, saying that there was much that was curious and interesting connected with the picture, which he (Mr. Glaisher) need hardly inform the meeting was obtained entirely by accident; and it was much to be regretted that Dr. Diamond had no explanation to offer on the subject beyond saying that such results were by no means of unfrequent occurrence with the collodions of *that* day. It might, however, be mentioned that the developer contained formic acid, and the collodion arsenate of quinine. It would be seen, on examination of the picture (which was passed round for that purpose), that the sky was of a distinct blue tinge, the trees green, the cottage white, the roof brick red, &c., &c. He (Mr. Glaisher) would also call attention to a second picture, a stereoscopic negative taken about two months since by Dr. Diamond. It would be seen that in one half of the plate the sky was red, and in the other blue, by reflected light. In neither case could any real explanation be offered; all that could be done therefore was to direct the attention of members to the pictures themselves, and allow the sight of them to exercise their own silent influence, which he (Mr. Glaisher) trusted would result in the prosecution of researches tending to the perfecting of the science of heliochromy. While standing he would take the opportunity of expressing the pleasure he felt at the recognition made by the Chairman of the very interesting collection of photographs lent for that evening by the Amateur Photographic Association. He had reason to believe that they were brought there in compliance with the wish of the Council expressed at the last meeting, to the effect that there should be exhibited at every meeting of the Society some objects of general interest which might serve as topics for discussion, whether a paper were read or not. The book then on the table contained some 1800 photographs by different amateurs, some of them possessing rare merit; and he (Mr. Glaisher) had much pleasure in recollecting that previous to the formation of the Amateur Photographic Association, when Mr. Melhuish had consulted with him as to its probable success, he had expressed it as his opinion, that, if the amateur could by such means get back some small return for the money spent in nitrate of silver, he would be encouraged thereby to spend it again for more, thus increasing his own pleasure at a reduced cost, and incidentally advancing the interests of the science of photography.

The Chairman called on Mr. Heath to read his paper

On the Enlargement of Photographs.

Mr. Heath said he was sure he should receive the indulgence of the Chairman and the members generally when he told them that, owing to the occupation of his time in the cause Mason *versus* Heath, he had been unable to prepare a paper. He would, however, endeavour to carry out his own real and anxious desire, which was to place before the meeting some notes on the subject of *Enlargement* worthy the attention of the Society; to which end he might say that he had, during the last three months, taken some 250 positives and negatives with the view of ascertaining the most suitable characters to be possessed by negatives for that purpose.

His present design was to lay before the Society, in a simple manner, his own method of working, so that those who felt sufficiently interested might take it up at his (Mr. Heath's) point and carry it on to perfection, since he entertained the conviction that (for amateurs at least) the future of photography would be found in small pictures, with subsequent enlargement at the convenience of the operator.

Those who had tried wet collodion, for landscape purposes, would bear him out when he reminded the members that its numerous advantages were much detracted from by the enormous weight of apparatus and materials which it was necessary to take for pictures—say 12 × 10. He might observe that, when leaving London for Scotland, he had had his luggage weighed at the Great Northern Railway Station, and he had to pay for 350 lbs. excess over the weight allowed by the Company. All this might, of course, be avoided by taking small pictures and enlarging them afterwards.

During the progress of the cause Mason *versus* Heath, he had been asked if a small negative could be increased in size. He had since then taken some 200 negatives, by two operations, from a negative of Mr. Mason's, and had not obtained one up to the mark; but the experience thus gained had enabled him to state distinctly the kind of picture most suitable for enlargement. He would describe his method of manipulating.

The camera he used he had brought with him, and the members could see that it was, in fact, two bellows cameras, with a Dallmeyer's triplet in the centre. He had, however, with the object of avoiding frequent calculation, attached to the side of the camera a graduated scale, the zero of which corresponded with the equivalent focus of the lens. He was thus enabled to dispense with the necessity for focussing altogether.

The negative to be enlarged was placed at one end. The required enlargement being known, the scale, which moved with the sliding bodies of the camera, was adjusted to the point indicated by the graduations. A transparent positive was taken of half the final enlargement required. This positive—which, while possessing every minute detail contained in the original, should have scarcely any intensity—was then placed in the position of the original negative, and still further enlarged to the size required. A bromo-iodised collodion, such as he usually employed for landscape purposes, was used, and the development effected by means of a five-grain solution of proto-sulphate of iron.

He might observe that he had been uniformly successful in obtaining the positive, but that greater difficulties attended the production of the final negative having all the required qualities in perfection.

[Mr. Heath here handed to the Chairman some negatives and positives obtained by his method. They were much admired—one specimen

especially, in which the softness of the shadows was really superior in the enlarged picture to the smaller original negative.]

He wished to direct special attention to one picture, the head in the original of which was not larger than a fourpenny piece. It was then enlarged to three inches in diameter, and might, he thought, be regarded as a better picture than the original. Many to whom he had shown the pictures had expressed the highest gratification at the results he had been able to obtain, but he (Mr. Heath) was not so fully satisfied.

He regarded what he had done as only a step in the right direction, and hoped to receive considerable assistance that evening from the remarks of those gentlemen who might take part in the discussion. His repeated experiments had very clearly indicated the kind of negative to be obtained; but he had experienced great difficulty in intensifying, and would be glad to hear the experience of members on that point.

He had tried long development with iron, subsequent treatment with bichloride of mercury, and other means, but still he had failed. Amateurs would find that method of working a great convenience: it was therefore very important that what was obscure should be cleared up.

Mr. Warner, of Ross (who, he was glad to hear, had been elected a member of the Society that evening), had very kindly sent some enlarged photographs side by side with the originals, so that members might see the advantages attending the method adopted by that gentleman, which was precisely similar to his own.

He should not be stating anything new to the members when he reminded them that it was possible to take *small* portraits with an exposure of two seconds, while *large* ones required a much longer exposure, entailing many disadvantages, all of which might be avoided by taking a small picture with the short exposure and enlarging it afterwards. It was very desirable to cut down the working apparatus for the field to the smallest possible dimensions for the convenience of tourists, and subsequent enlargement could be adopted or not at pleasure.

In the discussion which followed, Mr. Heath, in reply to a question from M. Claudet, stated that he illuminated his pictures while enlarging always by the north light, never by sunlight, and that his camera was placed at an angle of 45°—that an image the same size in the original required an exposure of about three-quarters of a minute.

The Chairman said Mr. Warner had exhibited similar photographs to those then before the meeting at the International Exhibition, but they were not there stated to be enlarged photographs.

Mr. Heath remarked that Mr. Warner had enlarged successfully, using a south light, with a ground-glass one foot from the negative, by which means he had avoided that chalkiness in the whites which was so objectionable. He (Mr. Heath) had also practised with long exposure, and he could corroborate Mr. Warner's statements as to the advantages of lengthened exposure.

The Secretary exhibited a picture, *i.e.* a negative, which was originally deficient in intensity, but which had been brought up to the required point by simple immersion in hyposulphite of soda for twelve hours. The effect was evidently due to sulphuration, and he merely mentioned it in connexion with intensifying in the hope of furnishing a hint to Mr. Heath, who had expressed earnest wishes for information in the matter.

A spirited interchange of question and answer then ensued between M. Claudet, Mr. Heath, and others, on the subjects of equivalent focus, and relation between lens, image, and object to be copied; at the conclusion of which,

Mr. Shadbolt intimated that an apology was in some sort due to Mr. Heath for the rather *interruptive* character of the discussion, suggesting at the same time that the object of Mr. Heath's communication relative to the appliances to the copying camera was to render the instrument practically serviceable rather than to discuss the optical question. He (Mr. Shadbolt) would ask Mr. Heath whether in the course of his experiments he had found parallel or converging rays produce the best results?

Mr. Heath replied that in his earlier experiments he had fixed his lens in the roof of a shed made for the purpose, placing a large cone around it on the roof, and using such rays as were thus obtainable from a zenith light, whether the sun were shining or not. Subsequent experience had, however, convinced him that it was best to have the camera and lens placed at an angle of 45°, towards a north light.

In reply to a question from M. Claudet, as to whether direct sunlight was not to be preferred, if obtainable,

Mr. Heath observed that with direct sunlight there was an unequal diffusion of light, and also an image of the sun itself produced upon the negative—results very much to be deprecated, and, of course, avoided.

M. Claudet said that from his own experience he warmly advocated the use of the solar camera and direct sunlight.

Mr. Heath, with equal ardour, set forth the advantages belonging to his own arrangement.

Mr. Shadbolt pointed out several of the defects of the solar camera, especially with regard to the dispersion introduced by the condensing lens, aggravated by the passage of some of the rays obliquely through the negative, and maintained that with such an arrangement it was impossible to produce a reasonably defined copy. If the condenser were made achromatic the evil would be to some extent palliated, but not cured.

Mr. Dallmeyer concurred in the observations of the last speaker, and dissented totally from the views entertained by M. Claudet. The dispersion and confusion described had in every specimen of solar-camera proofs that he had seen produced *fuzziness* to a very disagreeable extent. Mr. Heath's productions presented a much greater approximation in definition to the originals. With reference to the long exposure mentioned by Mr. Heath as being required, he (Mr. Dallmeyer) might state that he had made for Mr. T. R. Williams a lens expressly for enlarging to a definite extent—that is to say, in a definite ratio. A specimen of its work was on the table, and others were in the International Exhibition.

The discussion finally resolved itself into a friendly challenge between M. Claudet and Mr. Heath, between whom it was agreed that each gentleman, working from the same negative, should produce a picture enlarged eight times by their respective methods, and that the relative merits of the resulting pictures should be determined by the members present at the next meeting of the Society.

Mr. Heath, in conclusion, desired to remark that the subject had resolved itself into this—his (Mr. Heath's) method *versus* the solar camera; and he thought that before coming to any definite conclusion on the matter, it was necessary to consider various statistics in connexion with the latter instrument; as, for instance, how many days in the year could work be done with the solar camera? &c., &c. In reference to his own arrangement, he could only say that he had worked all through the months of January and February, regardless as to whether the sun shone or not; and he was glad to be able to look upon it as a certain and simple way of producing enlargements from small negatives, while he could not avoid the conclusion that the solar camera was a failure.

M. Claudet, a little sarcastically, inquired of Mr. Heath whether he had ever worked with the solar camera? To which the rejoinder was—"*No! but I have seen your results.*

The Chairman proposed a vote of thanks to Mr. Heath, which was unanimously accorded, and announced that at the next meeting, to take place on the 3rd of June, M. Claudet would read a paper in which he would speak—

1. *Of the Enlargement of Photographs.*
2. *Rule for Finding at Once the Degree of Amplification.*
3. *A New Mechanical Diaphragm.*

The meeting was then adjourned.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held at the City of London College, Leadenhall Street,—Thomas Sebastian Davis, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were elected members of the Society:—Messrs. Brookes, Clifton, and Wm. Cornish, Jun., of King's Road, Brighton.

Some copies of the presentation print—Robinson's *Early Spring*—were supplied to those members who desired to furnish themselves with the same on that evening.

Mr. Harmer exhibited some photographs and stereographs illustrating the opening of the International Exhibition, taken by the Stereoscopic Company, and kindly lent for that evening.

The Secretary (Mr. A. H. Wall) reminded the members that as this was the last meeting but one of the present session, it was necessary for them therefore to nominate officers for election at the next meeting. He would take the present opportunity of announcing his intention to resign the post of Secretary to the Society. He must say that it was with much regret he made this announcement; but he was in a manner driven to it by the increase of his own business, which now made such imperative demands on his time that he felt he could not retain the position he held in the Society, and do justice to the duties belonging to it. He trusted, therefore, that the members would accept his resignation, and appoint some other gentleman as Secretary.

The Treasurer (Mr. Howard) made a similar announcement to that of Mr. Wall, and stating that he was sorry that his connexion with the Society as its Treasurer should seem to terminate abruptly, having now filled that office for three years. He might say that although the duties of the office were not of the easiest, still they had been undertaken and performed with pleasure, as they had brought him into communication with gentlemen animated, like himself, by a love for photography; and the intercourse he had thus enjoyed had been to him a source of improvement and advancement in the art to which they were all devoted. Still he could not avoid the conviction that to do full justice to the duties required of him would take more time than he now felt himself able to spare for the purpose. He must, therefore, while saying how glad he should be to continue a member of the Society, express his desire that he might be excused from acting any longer as its Treasurer. He would make a formal resignation of his office at the next meeting.

Mr. Simpson felt that he was only giving a distinct expression to the murmurs of dissent with which these two announcements were received when he said that he hoped these need not be received as formal resignations, but only as intimations of what might happen if Mr. Wall and Mr. Howard could not, unhappily, be persuaded to continue in their respective offices. It would cause unfeigned regret to all the members of the Society that two such efficient officers should relinquish the duties they had hitherto performed with such great *eclât* to themselves and with the highest satisfaction to the Society generally.

The Secretary had much pleasure in announcing that the private view of the photographs sent to the Crystal Palace Photographic Exhibition

would shortly be opened, and each member of the Society would receive an annual ticket admitting him to the Crystal Palace to view these and the other attractions of the Palace, at any time. This boon had been handsomely accorded to the members of the South London Photographic Society by the directors of the Crystal Palace Company.

The Chairman then invited Mr. Blanchard to read his promised paper

On the Use of Bromides in Collodion.

Mr. BLANCHARD expressed his regret that he should have to appear before the meeting that evening with an apology. He was sorry to be obliged to say he had prepared no paper, though he had performed a number of experiments on the subject which he intended to introduce to the meeting that evening, and those he would describe as clearly and briefly as possible, directing attention in some instances to the deductions which might fairly be made from the results, and leaving the members to draw their own conclusions from the experiments as a whole. In further extenuation of the absence of a written *paper* by himself, he might say that he had worked at the experiments *con amore*, as his own earnest wish was to arrive at some definite conclusion on the subject; and this he hoped would be even more readily obtained by eliciting from the members generally the result of their own experience, than by writing an elaborate paper, the chief points of which he would then endeavour to lay before the meeting.

With the view of aiding the judgment of the members, and placing the matter more clearly before them, he would observe, by way of introduction, that the circumstances under which all the experiments were performed were, as nearly as possible, exactly alike, the object being to compare the results obtainable by using different proportions of bromides and iodides mixed, and those obtained by iodides alone. As his (Mr. Blanchard's) object in undertaking this series of experiments was to satisfy some doubts which existed in his own mind on the subject, members might rely on the accuracy he had practised in conducting them, and the care he had exercised with the object of making them a truly comparative series. He might observe that, notwithstanding all this, some of the results had not been altogether satisfactory to his mind; and he therefore would ask the members to accept his description of them as they then stood, and allow him to resume the subject at an early meeting in the next session of the Society, as he thought that, during the recess, he could prosecute his experiments under favourable circumstances, and, as he hoped, be able to come to some definite conclusion on the matter.

The experiments he would then describe were performed by pouring two samples of collodion on different halves of a stereoscopic plate, sensitising in the same bath, exposing an equal length of time at the same time, and developing with the same developer. The bath used for *all* these experiments was a nearly neutral one and quite new, giving good instantaneous pictures in his usual way of operating. The developer was a thirty-grain solution of protosulphate of iron, with as small a proportion of acetic acid added as was consistent with keeping the shadows of the negative clear.

Plate 1.
- Experiment 1.—Iodide of cadmium ..... 2¼ grains.
  Iodide of ammonium ..... 2¼ „
  Bromide of cadmium ..... 1 „.
- and
- Experiment 2.—Iodide of cadmium ..... / Iodide of ammonium ..... } 3½ „

That half of the plate which contained the bromide, it would be seen, produced a clean, clear picture, while that with the mixed iodides alone was misty and unsatisfactory.

Plate 2.
- Experiment 3.—Iodide of cadmium ..... 2¼ grains.
  Iodide of ammonium ..... 2¼ „
  Bromide of cadmium ..... 2 „
- and
- Experiment 4.—Iodide of potassium ..... 3½ „

When it was remembered that these two collodions had received exactly similar treatment throughout, a glance at the results on the same plate was sufficient to demonstrate most forcibly the advantage of the bromo-iodised collodion. No. 3 might, he thought, be called a good picture, while No. 4 had scarcely a trace of one.

Plate 3.
- Experiment 5.—Iodide of ammonium .... 2½ grains.
  Bromide of cadmium .... 5 „
- and
- Experiment 6.—Bromide of cadmium .... 5 „

The contrast in these two experiments was almost as striking as in the preceding pair—No. 5 having yielded a satisfactory impression, while No. 6 was as deficient as No. 4 in detail, though the general character of each failure (Nos. 4 and 6) was different.

These experiments (Nos. 5 & 6 and 3 & 4) went far he (Mr. Blanchard) thought to establish the fact that neither iodides nor bromides *alone* should be employed, but that success would be found to attend a judicious combination of the two, having at all times due regard to the bases of each salt. He was inclined to think that where bromides were used in large proportions a fair proportion of iodide should also be used, as calculated, he had found, to give a greater creaminess and opacity to the film. They must all feel that while it was perhaps possible for a simply iodised collodion to yield instantaneous pictures in the hands of experienced operators, a collodion containing a bromide being found after it was a little aged to be equally sensitive, and possessing other advantages, the preference would generally be given to the latter.

Plate 4.
- Experiment 7.—Iodide of potassium ..... 3½ grains.
  Bromide of cadmium .... 1½ „
- and
- Experiment 8.—Iodide of potassium ..... 3½ „

Experiment 7, containing the bromide, had yielded, as would be seen, a somewhat veiled or masked picture; while experiment 8—the iodide alone—was also by no means satisfactory. Another plate—

Plate 5.
- Experiment 9 ..... Same as experiment 7.
- and
- Experiment 10 ..... Same as experiment 8—

was therefore prepared and exposed two seconds instead of instantaneously. The results in that plate, it would be seen, were more marked, and abundantly demonstrated, in his opinion, that a simply iodised collodion, freshly iodised, did *not* yield so good a picture as a bromo-iodised collodion six months old. His (Mr. Blanchard's) practice was in accordance with the opinion he had then advanced, as he generally employed for his instantaneous pictures a collodion containing one-third of bromide.

There was still one other experiment, the result of which he (Mr. Blanchard) would have been glad to have shown; but, on washing the film after development, the whole escaped from the plate, and he had not had time to repeat it. He saw enough, however, to make a brief statement interesting to the members.

Plate 6.
- Experiment 11—Iodide of potassium ....3½ grains.
  Bromide of cadmium ....1¼ „
- and
- Experiment 12—Iodide of potassium ....3½ „

The development of these pictures was effected by pyrogallic acid two grains, acetic acid ten drops to the ounce. No. 11 had yielded a thin, clear picture; but the experiment No. 12, containing iodide alone, had produced a reduction of silver all over the picture, completely veiling all the detail, and showing, when held up to the light, a ruby-red colour, which is generally indicative of an alkaline bath, or over-exposure. He intended to make further experiments in this direction during the recess, and hoped to be able to lay the results before the members early in the next season.

The Chairman having invited discussion on the subject of Mr. Blanchard's communication,

Mr. HARMAN said he had experienced similar accidents to the film in washing off, as described by Mr. Blanchard. He had invariably found the film bear less development when a pyrogallic developer was used.

Mr. WALL said his experience corroborated the statements made by Messrs. Blanchard and Harman.

The CHAIRMAN said there was great diversity of opinion on the subject then before the meeting. First, in reference to sensibility, there were two conditions to be considered in coming to a conclusion on that point—namely, the collodion and the developer, and their mutual relation or suitableness to each other. If a pyrogallic developer and a simply iodised collodion were used in conjunction, an equal amount of sensibility was obtained as when a bromo-iodised collodion and iron developer was used. Another point for consideration was the chemical equivalents of the various salts, as the effects would vary with the particular bromide or iodide employed—that is, a far greater effect would be produced by an alkaline bromide, for instance, than by bromide of cadmium. The character of the pyroxyline also was an important element in those considerations, and must not be lost sight of. If a pyroxyline were used which gave a very dense image when iodised simply with iodide of potassium, he should advocate the addition of a small quantity of bromide of potassium, with the object of reducing that excessive density and producing greater clearness of picture. He had observed that if bromide of cadmium were added for that purpose even double the quantity did not effect the same reduction of intensity as half the quantity of an alkaline iodide. Then, as to sensibility, it was quite unnecessary for him to remind the members how easy it was to be misled by a slight variation in the focal length of the lens employed. He concurred with Mr. Blanchard in his statement as to the bromides maintaining greater clearness of image during development: he was further of opinion that bromo-iodised collodions were easier to develop, and moreover the collodion retained its sensibility much longer. The point at issue, however, was—was greater sensibility obtained with a bromo-iodised collodion and iron development than with a simply iodised collodion and pyrogallic development? He assumed that Mr. Blanchard did not regard that fact as firmly established beyond any possible doubt, and looked forward, therefore, with some interest to the report he had promised on his more mature researches.

Mr. BLANCHARD thought the experiments, so far as they had been carried, clearly indicated that there were many advantages arising from the use of bromides.

Mr. DAVIS suggested that the condition of the bath might have been specially favourable to one collodion and not to the other on the same plate.

Mr. SIMPSON explained that Mr. Blanchard had prepared a bath for these comparative experiments which was of a fair normal character and such as would yield good pictures, under ordinary conditions; and that he conceived was giving a fair chance to any collodion disposed to behave well, and had the advantage of securing uniformity of treatment for all the samples. The members were doubtless aware that Mr. Sutton had recently been experimenting on the subject, and had arrived at some rather strange conclusions thereon. Mr. Sutton regarded iodide of potassium as the most sensitive

iodiser, as he had found that collodion containing five grains of bromide required three hours' immersion in the bath before it acquired that rich creamy appearance which was generally considered indicative of the completion of the reaction between the iodiser and the bath. A few minutes' immersion produced only a pale blue tint in the film. He (Mr. Sutton) therefore expressed it as his opinion that when a large proportion of bromide was used a great deal of it remained undecomposed in the film, and that the sensitiveness was not in consequence increased. He even went so far as to say that he regarded bromides as retarders, rather than accelerators. It was sufficiently obvious that Mr. Blanchard's experience was in complete opposition to that of Mr. Sutton's; but as far as his (Mr. Simpson's) experience had gone he could only say that it corroborated the statements advanced by Mr. Blanchard. There was one singular point which was not quite so fully cleared up as it might be:—A mixture of bromides and iodides gave increased sensibility, while bromides alone were extremely insensitive: this required explanation. He (Mr. Simpson) when conversing with Mr. England on this subject had elicited the statement that in his (Mr. England's) opinion a bromo-iodised collodion was three times more sensitive than a simply iodised collodion, and it was generally observed that those who practised the art professionally gave the preference to collodions so prepared.

The Chairman suggested that as collodions containing bromide required longer immersion in the bath, that point ought also to be considered in connexion with their relative sensibilities.

Mr. Harman had always been in the habit of giving two minutes longer immersion to a bromo-iodised film than to a simply iodised one; and he had observed that when the withdrawal from the bath had been effected too soon, the creamy appearance of the film increased while in the dark frame, thus indicating that the reaction between the bromide and the nitrate adhering to the surface was still proceeding.

Several other members briefly stated their individual experience on the subject before the meeting, which was unanimously in favour of the use of bromo-iodised collodions, and therefore simply corroborative of the statements made by Mr. Blanchard and the other gentlemen who had taken part in the discussion.

The Chairman expressed a hope that Mr. Blanchard would renew his experiments, and favour the Society with an early report of the results.

Thanks were accorded by acclamation to Mr. Blanchard for his interesting communication.

Mr. Simpson exhibited a negative on a honey and tannin dry plate, obtained in seven seconds with a lens of six inches focus and a half-inch diaphragm.

The Chairman showed a negative obtained by a modified developing process with warm pyrogallic acid, without silver—a method which he conceived shortened the process considerably.

The next meeting having been announced to take place on the 12th of June, the proceedings terminated.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A meeting of the Committee of the Amateur Photographic Association was held on Monday, the 28th ult., at 26, Haymarket,—George Shadbolt, Esq., in the chair.

The minutes of the last meeting having been read and confirmed,

The Secretary laid before the meeting the printed catalogue of the Association pictures, the Committee expressing their decided approval of it.

A question having been raised by the Secretary relative to the price which should be charged to members and subscribers for the Prize Pictures (now the property of the publishers), it was decided, with their consent, that each member and subscriber should be entitled to select one copy of each of the prize pictures at the same rate as the other Association prints; but that for any additional copies it should be left to the publishers to regulate the price to be charged.

The subject of a Photographic Art Union in connexion with the Association was again discussed and adjourned.

The Secretary having pointed out to the meeting the *unavoidable* delay which had occurred in obtaining the first year's negatives, and consequently in the award of prizes, the preparation of the catalogue, and the distribution of the prints, it was decided that the Association year shall henceforth commence on the 1st of June instead of the 1st of May, and that subscriptions for the ensuing year will, therefore, not be due until the 1st of June next.

It was also decided, in reference to the selection of the prints by members and subscribers, that they may select them from any of the Association negatives which the publishers may have in hand, irrespective of the year in which they may have been received; and, further, that upon payment of their subscription members and subscribers may at once select their one or two guineas' worth of prints, as the case may be.

The proceedings of the meeting then terminated.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The concluding meeting for the current session will be held on the 21st inst., upon which occasion a paper will be read by George Dawson, Esq., V.P., *On the Practical Working of the Panoramic Lens*, illustrated by specimens.

EDINBURGH PHOTOGRAPHIC SOCIETY.

We resume our report of the meeting of this Society, held on the 16th ult.

After Mr. Taylor had made his remarks, introducing the subject of the Chimenti drawings [*vide* page 175 in our last number], he handed round the room several photographs of them for the inspection of the members.

Mr. Taylor stated that, as through the courtesy of Mr. Moffat he was in possession of the negative, it was his intention, had time allowed, to have projected the two pictures on the wall by means of two identical magic lanterns, so that the exact points of non-coincidence might be more easily appreciated. That, however, was not convenient for him to do at present.

Mr. Davies stated that, in his opinion, the slightest examination of the two pictures with a critical eye would at once show that they were not the work of the same artist. In the one picture there was the rapid, broad, artistic touch, not too careful of being overcorrect in drawing, but very certain as to the result wanted. The cast shadows on the one picture would be seen to be firm, broad, and well drawn. On the other they were looser and less carefully marked, and, in the case of the farthest off arm, almost omitted; but, on the other hand, that was the most careful. The stool was placed in true perspective, the string was drawn straight, the head was slightly corrected in position, while the expression was entirely different. Both drawings were sketchy; but the one seemed to show the master, who in a sketch could afford to despise all but the heart of the subject. The other was feebler, more careful apparently, but really far less true. He need hardly draw their attention to the fact of the leg in one of the pictures being very much out of position and out of drawing, as that matter must be visible to all. One thing would be evident, which was, that the picture with the most imperfections was the one which gave the greatest evidence of artistic power, while the more carefully drawn picture was by far the feebler in execution, which pointed to two hands as being concerned in the production of the two pictures. If Chimenti had understood the principles of binocular vision, and had intended this as an exposition of it, or even a sketch to see if it were correct, he would have been very careful to see that all the mechanical portions of his drawings were correctly to scale, which a glance would show was not the case. He (Mr. Davies) would by no means be inclined to dispute the stereosity of parts of the pictures; but while the one part was in the other was out, so that, on the whole, his opinion was decidedly against the idea that those pictures had been drawn in illustration of the theory of binocular vision.

Mr. Bow was inclined to think they were never intended to be stereoscopic, as they varied as markedly in a vertical direction as in a horizontal; and that in a horizontal direction the variation was sometimes such as would give a wrong character to the relief, the effect being a most disagreeable and imperfect combination. He thought there was something very deceptive in the power of the stereoscope as a test of the dissimilarity of two pictures, since he had found that if two identical prints of a subject in which the perspective was well marked were viewed in the stereoscope, they would combine and give a very strong impression of varying distances—not from any real stereoscopic power of the instrument, but from its neutralising the stereoscopic power of the eyes to detect the fact of the pictures being plane surfaces.

A Member inquired, when a person was enjoying a number of beautiful stereoscopic pictures, combining them, as many could, with the eye, unaided by a stereoscope, on whom should he bestow his gratitude for the discovery—modern certainly—in that form of development?

Mr. Taylor was not aware who was the inventor of the ocular stereoscope.

After some remarks by Dr. Dickson (of Carnoustie) and the Chairman,

Mr. Taylor said that, in accordance with a request made at the previous meeting by one or two members who were desirous of knowing the comparative merits of the dry *versus* the wet collodion processes, that subject would, during the few minutes that yet remained before the hour of separation, be discussed. While willing to state the case for any one side himself, he would have been at a great loss had [not Mr. Davies, to whom they had recently been much obliged, kindly offered to take the opposite side, no matter what it might be. On a friendly contest between them to decide the matter, he was glad that the worst side had fallen to his opponent, *pro. tem.*; for he might state that, for amateurs especially, the dry process possessed very many advantages over the wet, and it would be more than a task for the ingenuity even of Mr. Davies to establish the contrary. In the early days of the art an objection had been made as to the wiry hardness of pictures by dry processes; but, at the present time, that he thought would scarcely be urged, as it was patent to all that as good pictures could be got by the dry as by the wet process. They all knew that some of the finest pictures in the recent Exhibition in Edinburgh were by dry processes; nay, for the last three years, prizes have been awarded to such pictures. That might, perhaps, settle the question of quality; but, apart from that, there was the great certainty of success. In proof of that he might adduce the success attending one member who he then saw present in the room, who recently, during a visit to the Highlands, exposed forty Fothergill plates, only two of them turning out unfit for commercial purposes; and he was aware of another friend who, when he went to the country with a dozen plates, always

expected at least eleven good negatives. After narrating some incidents connected with trips to the country in which the two processes were tested, he spoke of the convenience of keeping a stock of plates prepared ready for exposure at any time. With a parcel of these one could go to the country unencumbered by any of the tents which they had seen at the last meeting—the best of which, no matter how ingeniously constructed, was still an encumbrance to an amateur. While the dry plates were advantageous, in being always ready for exposure, they also possessed the advantage of keeping, after they were exposed, until such time as the operator might find it convenient to develop them. He was aware of a gentleman who took a supply of Hill Norris's plates to Sweden, and developed them with perfect success after his return home. Mr. Davies would, doubtless, tell them of the great superiority of wet collodion for the purpose of securing instantaneous pictures; but they were all aware that instantaneous pictures were said to have been repeatedly taken on dry plates. Mr. Horatio Ross had said that the picture of the *Express Steamer*, by Mr. Kibble, of Glasgow, although going at full speed, and taken on a Taupenôt plate, showed every rope quite distinctly. Dr. Norris, too, was said to manufacture plates which were as rapid as wet collodion; and their American brethren were said to be taking instantaneous views on tannin plates. Perhaps his friend Mr. Davies would meet that by quoting the American Hillotype, by which, many years ago, photographs were taken in their natural colours, but which, up to the present time, had not been seen by any one. But times had changed since then, and he did not think the Americans could be bamboozled now as they were then. He would, for the present, assume their instantaneous tannin process to be a fact, although he confessed that neither he nor any of his friends had found an equal amount of success in that particular process.

Mr. Davies, in reply, stated that on this matter, as on many others, there might be truth on both sides, and an opinion on each. However, far from taking umbrage at the picture drawn by Mr. Taylor's fertile fancy of the cumbrous *impedimenta* of the wet photographer, he would rather try to damp his enthusiasm on the dry subject. Mr. Taylor, he said, seemed to look at the trouble and weight of his opponent's side through the magnifying, and at his own through the diminishing, end of the telescope; and, more than that, he seemed to invariably calculate on a 12 × 10 camera for the wet, and a stereo. for the dry process. That was all very well in debate, but in practice it was different. The half dozen of double slides in their pocket for a 12 × 10 would be found rather a bulky pocketful. Mr. Taylor had laid great stress on the dry-plate pictures taking the prizes at the Exhibition of the Photographic Society of Scotland; but he knew as well any person that there were landscapes in that Exhibition which no dry plate ever did or could come near. He would take some of those of Mr. Vernon Heath's for examples, and defy a dry plate, taken by *whoever* it might be, to give the detail and delicacy of those specimens he alluded to. Again: he insisted on his friend exposing forty plates and getting thirty-eight out of them; but they all knew that the gentleman alluded to would have got forty if he had been working wet collodion—in fact, *that* was not a question of processes but of men. They might give some men either of the processes, or any, and find no results; but with others certainty was nearly the rule. But why confine the question to landscape? Where, in portraiture, or grouping of figures and moving objects, was any dry process ever the most rapid? Emphatically nowhere! It was true that Mr. Taylor had alluded to Mr. Kibble's picture of the *Express Steamer at Full Speed;* but, in the first place, those who had seen that picture could say that Mr. Horatio Ross's statement of every rope being distinctly visible must be taken with a reservation: the ropes might be there, but so blurred that they would not pass for more than what Mr. Ross had claimed for it, a *passably* instantaneous dry process. But, altogether, Mr. Taylor was unfortunate in his instance. Who, for example, would be prepared for a ninety-hours' development, as we have it recorded of that picture? Only think of a development extending over ninety mortal hours! The thing was preposterous. As many seconds would almost suffice by the wet process. So with exposure and the rest of it. The dry plate was all very well when they could get the trees and water and figures steady for five or fifteen minutes to order; but as those objects would persist, in nineteen out of twenty cases, in moving just when the operator did not want them, then they would see they had no refuge but in the wet plate. He (Mr. Davies) was by no means disposed to adopt as a fact the American statement as to the instantaneous tannin process. Should it, however, be proved, no one would hail it more joyfully than himself. In the meantime, his judgment, like Mahomet's coffin, should be suspended. He (Mr. Davies) would sum up his observations by admitting that if there was less trouble in the field with the dry process, there was more in the preparations, with the added uncertainty of results which more than counterbalanced the very few additional pounds weight, which he would have thought Mr. Taylor's herculean shoulders would hardly have felt; while, with the wet process, there was the inexpressible charm of *seeing* what you had got at once and on the spot, and, if the picture was badly chosen, you could at once change for a better point of view, and then they had always the chance of introducing *life* into their pictures. He hoped, however, that the wet blanket he had been compelled to administer to Mr. Taylor would not dry up his enthusiasm for either of those very useful photographic processes.

Owing to the lateness of the hour there was no further discussion. The meeting then separated.

The same Society held one of its popular evenings on the 5th instant, when there was a very numerous attendance of the members and their friends. J. D. Marwick, Esq., President of the Society, occupied the chair, and introduced Andrew Mure, Esq., Advocate, who delivered a lecture on *A Tour in Rhine-land*, which was illustrated by transparencies prepared by Mr. Ramage, and exhibited by means of the oxy-hydrogen lantern. There was a considerable number of ladies present.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

The usual monthly meeting was held in the Religious Institution Rooms, on Thursday, the 1st instant,—Mr. Hugh Wilson in the chair.

After the minutes of the previous meeting had been read and approved, the private business of the Society was entered upon, relative to a new rule, which was postponed till the following meeting.

The Chairman then called upon Mr. A. Robb to read his paper *On the Resin Process.* [See page 188.]

On the conclusion of the reading of the paper a number of prints were handed round, taken from negatives prepared by that method. These gave rise to an animated conversation. As the process was new to most of the members, Mr. Robb was subjected to numerous queries relative to the manipulation of the plates, &c., which were cheerfully replied to.

The members present were of opinion that the dry method under discussion—so simple and economic in point of time and material—gave results superior to many of the dry processes in vogue, as the gradation of tint from the highest light to the deepest shadows was finely rendered, without that hardness of outline peculiar to dry-plate photography.

Mr. Robb received a cordial vote of thanks for his interesting paper.

Mr. Gilfillan was elected a member of the Society, and two other gentlemen were entered upon the roll, to be ballotted for at the next meeting.

After the usual vote of thanks to the Chairman, the meeting separated.

Foreign Correspondence.

Paris, May 10th, 1862.

Some time back I spoke of a process which had then just been communicated to me by its author, Dr. Sabatier, for transforming into transparent positives upon glass the negatives in the camera.

In that process the practical difficulty was in arresting the formation of the negative image in time to make of it a positive. The author has sought the means of doing so, and has succeeded in finding it. Instead of iodising his collodion solely with the iodide of cadmium, he now employs the following formula:—

	Grammes.	Centi-grammes.
Collodion	120	00
Iodide of cadmium	1	00
Iodide of potassium	0	50
Bromide of cadmium	0	40
Bromide of potassium	0	20

These two iodides have not the same sensitiveness, the iodide of cadmium being the most rapid, and the iodide of potassium the slowest of all the iodides that are used. It follows that the first is acted upon and developed in the laboratory much more promptly than the other, so that the negative formed with the iodide of cadmium appears in all its details, while the iodide of potassium is still at such a point of its development as will permit the formation of a positive. All the other operations remain such as the author first announced them; only for the toning of the image which had been fixed he employs a method quite in opposition to received ideas. After the fixing he washes his glass, and then covers it with a half per cent. solution of sulphuret of potassium. The picture immediately takes a very fine dark tone. It is then promptly washed, dried, and coated with picture varnish diluted with five times its volume of essence of turpentine.

This toning with sulphuret of potassium must of course augment the sulphuration, and yet, though the author has submitted his finished pictures to numerous causes of destruction, he has not perceived that they have lost any of their original hue.

In my last letter I spoke of the favourable judgment delivered by the Court of Appeal in the matter of Mayer and Pierson. I cannot resist the desire I have of giving you some passages from the pleading of Maître Marie; for to his outburst of eloquence was largely due the victory won. Maître Marie not only ranks amongst our greatest barristers—our foremost jurisconsults—he is also a man of high artistic intelligence: it was that which gave to his words the greater authority.

"That which at first," said he, "had struck the mind was the photographic instrument. He who used it was thrown into the

shade: he disappeared and was counted as nothing. But that is a wrong on one hand—a falsehood on the other; for thereby he is ousted from a possession which from him has taken its lustre. * * What then is art? Who shall define it? Who fix its starting point and its boundaries? Who say to it thus far shalt thou go and no farther? I ask philosophers, for they have sought an answer, and we may read with interest that which they have said on art in its varied manifestations. Art, say they, is the beautiful, and the beautiful is the true in its material reality. If in photography we show forth the true, and if the true in its materiality charm the eye, how is it then no art? If all the characteristics of art are found in it, how can we say that it is no art? I protest, then, in the name of philosophy. * * * Daguerre's invention had been bought by the State. Then came a day when Niépce and Arago promised to reveal before the assembled Academy of Sciences the secrets contained in that discovery. The Academy of Fine Arts demanded to be present, and under that double patronage this child of light made her entrance into the world; far then from thinking that her filiation to science would one day be disputed in the name of science—her filiation to art in the name of art. Thus she came into the world under the protection of science and of art, who seemed to have adopted her, if indeed she was not their own child. * * * True, the photographer creates not, invents not, as the painter does—at least not to the same degree. But when he will take a view or landscape, does he set about it without discernment as a common workman would do? No! he does what the painter does, if he is a man of genius—if he is a man of sentiment—if he is a man of taste. He blends in happy harmony light with shade. Like the painter, he makes his picture in his mind; and when he has formed it there he takes his apparatus that it may give him that which his fancy has seen, and which he seeks to transfer to his work."

I must stop there, for I might quote the whole. The influence which it exercised on the minds of the judges is proved by the fact that the judgment produces several passages of it nearly word for word. After reading this fine speech, and M. Claudet's letter, which you published in your last number, I wonder whether it will again be said that photography is no art, and that photographers are but common workmen.

Mr. Léon Vidal, who has just passed a few days at Paris, has communicated to me some important projects which he has already begun to put into execution, and which are calculated to give great development to photography. The intelligent Secretary of the Marseilles Society has already proved that he knows how to establish firmly that which he undertakes. We have no doubt that success will attend the efforts he is making.

ERNEST LACAN.

New York, April 25th, 1862.

Having left Philadelphia, on a short trip to New England, I now write from New York, after a peep into most of the photographic places of interest.

Amateurs are full of the quick dry processes, and most are quite enthusiastic about warm water (they used to call it hot) for wetting the plate. At the last meeting of the American Photographical Society this warm water of Dr. Draper's was the subject of much of the evening's business: it seemed evident from the experience of most present that the water should not be much hotter than 80°, and that the bath should be very acid. Mr. Thompson said that his plates were all made in a succession of six plunge baths—the first one containing silver, the four next water, and the last one tannin. He could thus make twelve plates in one hour. Mr. Henry T. Anthony, however, proposes a plate sensitised as usual, and when well washed flowed with a solution of five grains to the ounce of a solidified milk—an article of commerce in New York, but unknown in the rural districts, where cow's milk is preferred as an article of diet.

I have seen many of these dry-plate negatives, and they work quickly and are full of detail. Their keeping qualities are not yet known. This solidified milk has been made by boiling down and adding sugar: most likely it differs from ordinary milk in the coagulation of all albumen. Those who have tried both milk and the solidified article say the latter is not so harsh as the former.

Photographic art in this city is having a large share of patronage. The down-town galleries are gradually moving further up the great thoroughfare, Broadway. Card pictures are all the rage, and there are many novelties in the way of card albums. Mr. E. Anthony tells me that their trade in cases has fallen off considerably; but the trade in card pictures is increasing very rapidly. They are now printing 100 sheets of paper each day, producing 3600 card pictures. The ones that sell best are soldiers and popular statesmen; but literary and theatrical characters are in demand, as are also small copies of engravings. They have published two small pictures, one called *Young America*, and the other *Young Africa, or the Bone of Contention*. This latter is a first-rate picture of a young darky, and is in great demand both north and south.

One curious circumstance in relation to the sale of these pictures is that in many of the cities of the northern slave states, where there is said to be a strong union feeling, portraits of the southern generals are very much more in demand than are those of the union army.

Among the stereoscopic pictures few are sold except the new instantaneous ones that may be made; and Mr. Anthony's recent, as well as all his old instantaneous views, show that an assertion made at a meeting of one of the London Photographic Societies was not quite the thing—viz., that "in America they were perhaps content with only a moderate degree of instantaneity."

I had the pleasure yesterday of riding to the Harlem River with Messrs. Anthony and Thompson. I took my wet collodion fixture with me, and Mr. Thompson scrambled over the hills with his dry-plate box and his dozen plates. He had a good time of it compared to my labour; but I knew what I had got, and was well satisfied with my afternoon's work. Mr. Anthony contributed some of his very quick collodion, and there was great trouble in keeping the plates from fogging, until the yellow glass window was covered with two thicknesses of yellow envelope paper—and then we got on bravely with very short exposure: we were not aiming at instantaneous work. I cannot say too much in praise of Mr. Anthony for his liberality in imparting information: the afternoon was one long lesson to me, and left me deeply in his debt for knowledge gained.

We hear more now of iron-plated ships than we do of pictures; and on a visit to Captain Ericcson, designer of the *Monitor*, I found him deeply engrossed in his plans for other ships on the same plan.

Professor Rood has made some very interesting experiments in photographing the electric spark, and has shown, in an ingenious way, that the impression on the plate is due to the light of the spark and not to any decomposing property of the fluid. He prepared a sensitive plate, and while wet, allowed well-defined sparks to strike it: these, developed, gave certain distinct images, always having the same characteristic form. He then covered the film with a sheet of thin glass wet with nitrate of silver: the spark striking this impressed the film below. He then substituted a yellow glass similarly prepared, and the film was not impressed at all. His account of the experiment was published in the last number of Silliman's *American Journal of Science and Art*, and is worth reading.*

Dr. Oliver Wendell Holms, of Boston, "the autocrat of the breakfast table," writes to me that Dr. Dean, of Boston, has made some very fine photo-microscopic sections of the spinal column, of his own preparing. Photo-micrography has engaged the attention of many of our *savants*, and has produced much good in a scientific way.

By-the-by, it has been said by some photographer just returned from America that there was no pyrogallic acid to be had in New York—that he had searched diligently for it in all the stores, &c. This is news to us. It is always to be had in large quantities, and has been used ever since photography has been known. It is a great deal used in the wet process to strengthen, after a picture developed with iron has been cleaned and washed.

I shall tomorrow go to Hartford, Conn., and then to Springfield, Mass., and on my return home will be able to say more about photography in Yankee land.

Mr. Ladd, the publisher of *Humphrey's Journal*, tells me that his May number will be in a new form, being in the shape of a newspaper, having more room for matter and more room for advertisements, and the general scope of the journal will be enlarged so as to include some sciences near akin to photography. It may be better for him; but I do not like the newspaper form for scientific periodicals, on account of the difficulty of binding. It may meet with favour, as I hope it will, in spite of its shape.

I have a memorandum book full of matters of interest to your readers; but I must look them over at home and sift the good from the bad before jotting them in my letters to you.

COLEMAN SELLERS.

* We have had Professor Rood's paper in type for a month back. It will be found in the present number, page 190.

Scraps and Fragments.

Exposing Shutter.—We have received several communications expressive of approbation with regard to the convenience of the shutter for exposing two or more card portrait lenses at one time, introduced and described at a recent meeting of the Photographic Society by Mr. Dallmeyer.

Photography at the International Exhibition.—The Duchess of Cambridge with the Princess Mary, the Crown Prince of Prussia, and Prince Oscar of Sweden, each in turn stood on the steps of the throne at the International Exhibition, on Saturday, the 3rd inst., surrounded by the members of their respective suites, and admirable photographs of the various groups were taken by the artists of the London Stereoscopic Company. Photographs of the opening ceremony have been forwarded to Her Majesty, as we intimated in our last would be the case, and duplicates have also been sent by desire to H.R.H. the Crown Princess of Prussia.

Convenient Camera.—Mr. Ross has just introduced a very convenient camera for stereoscopic pictures, and adapted also for taking views of about 7 × 5 in. The sliding front carrying the pair of stereoscopic lenses can be replaced by another for a single lens of longer focus, the internal division removed, and the whole frame thrust forward about four inches by means of a bellows arrangement, steadied by lateral metal and wooden stays, and the focussing effected by a rack and pinion near the back in both conditions of the camera. It is a very convenient arrangement, and a camera thus constructed is adapted for lenses of from five to ten or more inches of focus.

Astronomical Photography.—At the last meeting of the Royal Astronomical Society Mr. Warren De la Rue exhibited engravings from negatives of the spots on the sun, taken at his Observatory at Cranford, by his 13-inch reflector, on the 24th September, 1861. The engravings were obtained from the original negative by means of light and electro-metallurgy; the electro-copper block, being absolutely untouched by the graver, was used for producing the printed impression at the ordinary typographical press. The process for obtaining the block was similar to, if not identical with, that of M. Fontaine. A metal plate, being coated with gelatine and bichromate of potash: is exposed under the negative, it is then soaked in lukewarm water to remove the unaltered gelatine, &c.: it is then covered with solution of pyrogallic acid to harden the gelatine, which presents a proof in *intaglio*. When dry, a solution of gutta percha in bisulphide of carbon is poured on the impression, and a thick sheet of gutta percha warmed on one side is immediately applied, and the whole placed under a press. On removal from the press the gutta percha matrix in relief is coated with plumbago, and submitted to the electrifying process.

The Law of Copyright.—A few weeks back we mentioned the fact of Mr. Mayall having obtained a verdict in an action he had brought for the recovery of certain prints from some of his photographs, which prints he had *lent* for the purpose of engraving. These prints having been erroneously sold, were copied by means of fresh negatives being taken from them by the purchaser of the prints so lent by Mr. Mayall. We likewise pointed out that the result of that verdict did not in any way establish the existence of *copyright* in photographs. A rule *nisi* having been granted by the Court of Exchequer, calling upon the plaintiff to show cause why the verdict he had obtained upon one of the counts of his declaration should not be altered, it was at first expected that the question of copyright would come under discussion; but the Court afterwards expressly stated that copyright was not the point of consideration, and was quite beside the question at issue between the parties. As, however, it seems to be erroneously supposed by some persons that a copyright exists in photographs either by the common law or under the Engraving Acts, it may be useful to point out how the matter stands. If any such right is claimable in a photograph *after its publication*, it can only be by analogy to copyright in books, which the House of Lords has, upon more than one occasion, decided does not exist by the common law, but only by statute. These cases were argued in the presence of the common law judges. Upon the last occasion the Lord Chief Baron Pollock was present, and he expressed a very decided opinion against the existence of copyright by the common law. He said:—"I think the common law cannot create new rights, and limit and define them, because in the opinion of those who administer the common law such rights ought to exist according to their notions of what is just, right, and proper. Weighing all the arguments on both sides, and looking to the authorities up to the present time, the conclusion I have arrived at is, that copyright is altogether an artificial right, not naturally and necessarily arising out of the social rules that ought to prevail among mankind assembled in communities, but is a creature of the municipal law of each country, to be enjoyed for such time and under such regulations as the law of each State may direct, *and has no existence by the common law of England*. It would follow from this that copyright in this country depends altogether on the statutes which have been passed on this subject." Again, in a recent case in Ireland, which arose out of a photograph having been made from recollection of an oil picture, *The Death of Chatterton*, the Master of the Rolls in Ireland said:—"I apprehend it is clear that by the common law copyright or protection exists in favour of works of literature, *art*, or science to this limited extent only, that while they remain unpublished no person can print them, but that *after publication* they are by common law unprotected." It is therefore quite certain that the common law affords the author of a photograph no protection in the shape of copyright after it has been published. The question then arises whether any statute affords him such a protection? Unfortunately in the present defective state of our laws of artistic copyright there is no authority for saying that any such protection exists: on the contrary, "The Copyright (Works of Art) Bill," which has passed the House of Commons, and is now in the Lords, expressly recites as a fact, "that by law, as now established, the authors of paintings, drawings, and *photographs* have no copyright in such their work." We trust that such an injustice will now be speedily remedied by that bill being passed in such an amended form as is requisite for the protection of all parties whose interests it affects.—*Athenæum.*

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

A FEW FACTS CONCERNING THE PHOTOGRAPHIC DEPARTMENT OF THE INTERNATIONAL EXHIBITION.

To the Editor.

Sir,—There are some physicians who, after taking an unfavourable view, fear to tell the patient the worst, and hold out hopes and hazard a prognosis which the circumstances of the case do not justify. Such a course is always deserving of censure. It is far more wholesome to know the full extent of the disease or disaster. Being every day at the International Exhibition, I perhaps have more extensive opportunities of taking a correct diagnosis than many. Would it were possible to give a more flattering account; but the worst fears have been realised. Every day, while the picture galleries and other departments have been well filled with gazers, I have now and then run up the *photographic stairs*, and the echo of my own footfall has been the only sound that greeted my ear. A silence as of the grave prevailed. Not a soul to be seen, save sometimes one or two persons there for some special purpose.

I have never at any time believed that the *general* public felt so sufficiently interested in photography as to *seek* out its displays. I have always thought that '62 would be an opportunity of creating such a feeling amongst that large class who never find their way to our annual Exhibitions. This illusion is dispelled in a way which makes it a matter for both congratulation and anger. I am constantly stopped by people asking their way to the display of photographs. Even while in my dark room, developing, I am disturbed by policemen rapping outside, when a colloquy something in this fashion ensues:—"Rat-a-tat-tat."—"Who's there?"—"X 99. Please, can you tell us where is the photographic department? The people do bother us so, and we don't know where to direct them." No wonder!!! Sometimes people just go in the recess at the entrance, and looking round at the coarse brick wall, conclude it is only a staircase for the egress of workmen to the roof, and turn away again. There is no inscription up whatever, as there is to every other department in the building. One day we found a lady taking her luncheon on the stairs. It appeared it was not her first offence. Not wishing to seek the refreshment department, she said "she always found this a quiet retired spot [quite unconscious of anything to be seen above], and could immediately return to the picture gallery."

But the *coup de grâce* was reserved for Saturday last. While copying Woolner's beautiful statue of *Constance and Arthur* the morning before, I had observed carpenters at work at some suspicious-looking pigeon-hole, stands, racks, &c., and on Saturday took the pains to go to see if my suspicions would be verified. I found the whole of the recess or entrance-way at the foot of the stairs under the charge of two or three girls, and dedicated to the inglorious purpose of *a receptacle for sticks and umbrellas* of visitors to the picture galleries!! Some gentlemen just at that moment took a glance up the stairs, as if mentally inquiring if there was anything above. The inquiry was anticipated by one of the aforesaid

girls, in this fashion—"O! that's only a likeness place up there!" I forbear comment.

On the other hand, while conversing with a friend, M. Angerer, photographer to the Imperial Court of Vienna, who has some fine specimens in the Austrian department almost under the western dome—a place where everyone sees them; indeed it is scarcely possible for every visitor who enters the building not to do so—I have heard such exclamations as the following:—"Dear me! how beautiful! We have not anything so good by our photographers!"

It would be vain to attempt to tell them that there is an attic in the southern tower, about half-a-mile from this spot, where some good English photography may be seen. Some of the foreign photographers are quite astonished when I explain to them that Maxwell Lyte is an Englishman, for Maxwell Lyte is the greatest gun in the French department. He has worked on a larger scale than formerly, with immense success, and his two large frames of Pyrenean views are by far the best shown.

I took M. Angerer one day into our department, and, without making any remark, pointed out works by various hands in different parts of the room. He turned round and counted on the tips of his fingers four, five, and six—meaning that they had as many different places; and he seemed perfectly horror-stricken, venting his disgust in some German phrases which will scarcely bear translation. He then recommenced adding notes to his voluminous pocket-book. I imagine he will have much to regale his countrymen with on his return to Vienna.—I am, yours, &c.

S. T.

WHAT THE ROYAL COMMISSIONERS HAVE ESCAPED.

To the EDITOR.

SIR,—Under an article headed "Photography at the International Exhibition" (April 15th page 142), while discussing the short-comings of the International undertakers, you conclude the paragraph with the following:—"To say nothing of Mr. Skaife and his pistolgraph, by which (as he advertises) he can take portraits or views without the knowledge or consent of the individuals concerned!"

It is long since I gave up advertising to do that sort of business.

Times are changed since the profession of a bravo was worth an honest man's while. If novelists can be relied on, patrons in the good old times were more liberal to an *expert* who jobbed in the dark than the same class of patrons are now-a-days to those who job in the light. In other words, a higher figure was more willingly conceded to poinard a hated object than is now paid to *pistol* a *carte-de-visite* hater.

It is now more than two years ago since I was beguiled into a negociation by a fair temptress located not a hundred miles from Portland-place, who wished to know my terms for *pistolling* an ill-natured husband, who persisted in refusing to let her have his photograph on any conditions. After casting up this bear's habits, time of day when he walked abroad, sun's altitude, and the whereabouts of St. Marylebone Church's shadow, &c., &c ,—I said the fee, in £ s. d., was so much—at which the lady paused then begged to defer having her brute done for in that way until she had further considered whether it were worth while to pay so much for a thing—so little. I take it for granted the lady concluded as Mr. Weller senior would have done, for from that day to this I have heard no more on the subject, and as far as I am concerned the churl has remained unrobbed of his picture to the present hour. But as this does not prove the "*as he advertises*" to be other than "trade brag," I take the liberty of forwarding for your inspection two pistolgraphic studies, copies from originals now in my possession, taken by one of my pupils.

The first represents an equestrian party—a gentleman and three ladies on the trot in Hyde Park. Who this party were I know not, nor did my pupil who took them; nor were the party aware, I believe, of their being taken—success, in the result, not being dependent on their being so, even supposing this victimised party, previous to their setting out on their usual morning drive, had been cautioned not to loiter by the way, as a photo. robber was believed to be lurking somewhere in the Park. Of course they knew what a photographic camera was; but they did not suspect that yonng gentleman knew "the time of day" as well as they did before he looked at his watch, as they drove past him in Rotten Row, and, possibly, they are yet guiltless of any knowledge of their having been *done* by the rather "flashy-looking repeater"—although the likeness of one of the party, *molgré* its smallness, possesses as much recognisable individuality as though it had been done in one of the first-class *carte de visite* studios in London.

The second and larger photographic proof is much less distinct. As a photograph it is a failure. Nevertheless, considered historically, it is not devoid of interest. In the background appears a building of a certain style of architecture; in the foreground, to the left, a horse in gig harness; behind which is perceived a second horse, bestrode by a postillion in dark jacket and light "breeks." The tail-band of the second horse brings the eye to the dark outline of a coach-box, across the seat of which is stretched a hammer-cloth (where P is damaged by a scratch), behind which two hats appear—showing the owners thereof to be sitting *vis-a-vis*—a white parasol, beneath which are sitting two ladies, behind whom stand two footmen with cravats and waistcoats as white as the two ladies' veils, and with faces as dark. Following the dark outline of the taller footman, the eye arrives at a wheel in the foreground to the right, between the spokes of which a leg belonging to some invisible body is perceived to be in the act of trying to establish a foot—with what intention may be gathered from the following:—

In 1860 *The Times* informed the public that Her Majesty would leave Buckingham Palace about 4 p.m., to open the prize rifle shooting at Wimbledon. Wishing at the time for a pistolgraphic portrait of the Queen, I despatched one of my "familiars" to the *locale* of the Palace, with instructions to procure a cab and seat himself outside thereof along with the driver, taking the precaution, in order to avert a possible catastrophe, to inform the cabman of his object, and be sure to cover the little instrument with his hand when Her Majesty passed. My pupil had just got seated and adjusted his piece as the royal party drove briskly up in an open carriage, when click went a trigger, and the deed was done!

If the position and light had been as favourable on this occasion as it was when the Hyde Park equestrians were done, there can be little question but that this little picture would have possessed a value superior to any other photograph for which the Queen might have voluntarily sat. As it is, it is simply a registered fact of a carriage party *en route* at a certain epoch; and though none of the faces of the party are recognisable by reason of their being under-done, the circumstantial evidence of the accessories, by those familiar with the royal equipment on that occasion, will be admitted as tolerable proof of the occupants' rank.

1st, there is the postilion; 2nd, shape of the open carriage; 3rd, the pattern of the parasol; 4th, livery of the two footmen behind; 5th, the incident of the three tallest figures—viz., gentleman, lady, and footman—being at the left side of the carriage, whilst the three shorter figures occupy a line to the right But, whether this arrangement was accidental or designed, investigation alone could prove.

Such being the result of the only attempt on Her Majesty with which I have been concerned, I submit that with improved opportunity it would be next to impossible for the Queen to escape being pistolgraphed to perfect recognition, sooner or later, if she continued to drive out in public during daylight as she has hitherto done.

Such speculative subjects, however, are rather within the province of those amateurs whose necessities do not oblige them to undertake *the charge of so many babies* as I am obliged to do.

When our numerous amateur photographers have medalled each other into practical excellence in still-life subjects, they will be flying at higher game. Killing sheep is one thing—but deer stalking is another.

I am, yours, &c., THOMAS SKAIFE.

[In adverting to Mr. Skaife's assertion of his capacity for taking portraits, &c., "without the knowledge or consent of the individuals concerned," we inserted the words "as he advertises" because we quoted the words of his advertisement—not to throw any doubt upon his assertion, which we knew to be well founded; and, had we not known its truth before, the specimens received would have proved it to our satisfaction.—ED.]

PRESERVATIVE CASES, &c.

To the EDITOR.

SIR,—If you would kindly answer the following queries in your next Journal, or as soon as convenient, I should feel greatly obliged.

1st. Can I mix a small quantity—say six or eight ounces—of fixing solution, and with the same fix two or three album portraits a day for a week? or must I mix a fresh quantity every time? I am able to devote but little time daily to photography.

2nd. Is a preservative case with quick lime likely to injure the results at all in the subsequent processes?

3rd. May the picture be printed and put back into the preservative case and kept a few days or a week without injury?

4th. What is the cause, when working with the same collodion and intensifying with a preparation of bichloride of mercury, of some of the pictures drying with small cracks in the film, while some dry quite perfect?—I am, yours, &c., A SUBSCRIBER.

Salisbury.

[1st. It is the keeping from day to day of the fixing solution which is apt to render your proofs unstable. You will find it a convenient plan to keep a wide-mouthed bottle filled with saturated solution of hyposulphite of soda: mix one part of this with two parts of water: throw it away into your waste solution at the end of each day's work.

2nd. Paper kept *too long* in any of the preservative cases is apt to be less brilliant when printed than when used fresh.

3rd. Yes, but not longer.

4th. Clearly some difference in manipulation. Probably the film may be thicker in one case than in the other. Again: the washing may be imperfectly done in some instances.—ED.]

HOT WATER DEVELOPER.

To the EDITOR.

SIR,—In reply to your note, I beg to inform you that the mode by which I prepared the plates was with bromo-iodised collodion bath, 35 grains nitrate silver to the ounce of water, very acid with acetic acid, plate slightly washed, then coated with warm gelatine solution—the formula for which was 150 grains of gelatine to 16 ounces of water, alcohol 1½ oz. The water used was that as supplied by the East London Water Works Company, and boiled in a copper vessel. My first impression was

that the water contained iron; but, on being tested, no traces were perceptible. The matter, therefore, why the picture should appear without the presence of organic matter, remains unexplained. Plates prepared with albumen were subjected to the same treatment; but in no instance could the slightest trace of a picture be seen, though, on applying the developing agent, the action was extremely rapid. Under these circumstances I used hot water as a developer for pictures under-exposed. I also believe Mr. Nichols's instantaneous dry process to be founded on the hot water principle.—I am, yours, &c., H. E. CHALKLY.

PHOTO-MICROGRAPHY.

To the EDITOR.

SIR,—A slight inaccuracy appears in the last number of your Journal, wherein it is stated that I said that I had seen a daguerreotype copy of the proboscis of the blow-fly showing the ramifications of the spiral vessels delicately rendered, and that it was taken through an eye-piece. I certainly maintained the latter part of the foregoing; but I must have been misunderstood when a daguerreotype plate was asserted as the sensitive medium whereon same was depicted. The picture I referred to was No. 528 of the Photographic Society's Exhibition of 1861, when, turning to the catalogue, I now find it thus described:—"Extremity of blow-fly's tongue—Powell and Lealand's quarter-inch object glass. No eye-piece employed." So I was in error.

If you think it necessary to correct the statement, the above are the facts of the case.—I am, yours, &c., JOHN BOCKETT.

May 6th, 1862.

MELAINOTYPE PLATES.

To the EDITOR.

SIR,—Being far out of the reach of advice or assistance on photographic subjects, I take the liberty of requesting yours under the following difficulties:—

I have lately been trying to work with "melainotype" or japanned metal plates, which are extremely convenient for positive pictures, especially for lockets, &c., if they worked properly. I have been informed from several quarters that these generally work as well as glass plates, but am surprised to find in them an extraordinary want of sensibility, generally requiring four or five times as long as a glass plate, and even then the image comes out dark and often dirty. I have observed that the collodion seems to have a propensity to set in hard diagonal streaks much more than on ordinary plates. I have taken great care in cleaning these plates thoroughly by rubbing them with alcohol, which, I am informed, is the proper and only way of cleaning them; but it seems the more I rub the worse is the result obtained. What surprises me most is, that now and then, though *very* seldom, without any particular care, the image comes out well. I have corresponded with other photographers on the subject, who cannot tell me more than that they are accustomed to use them and never experience the results I mention; however, as there *must* be some cause for my want of success, perhaps you will be kind enough to consider the subject a little and let me know your opinion. I must beg you to observe that I do not speak of the results of a few trials, but of a long-continued and obstinate, though unsuccessful, endeavour to ascertain the cause of my failure.

The other difficulty I labour under is the following:—In a late number (156) of THE BRITISH JOURNAL OF PHOTOGRAPHY a method is given of varnishing pictures with a mixture of bees-wax and turpentine. I have in vain essayed this plan (after always duly hardening the paper by a solution of gelatine); but I find that the rubbing with a rag after the application of the bees-wax, instead of giving it a polish, wipes it clean off the paper again. Please explain what mistake I make, as, doubtless, some must exist in my method of proceeding.

Hoping you will vouchsafe a few lines in your next number in explanation of these difficulties, and requesting your pardon for boring you with such a lengthy communication.—I am, yours, &c.,

Cordova, River Plate, March 14th, 1862. JOHN S. O————N.

[The supporting surface certainly does exercise an influence on the results of a collodion photograph, but we scarcely think this is detrimental in your case. We presume, however, that the climate is such that the temperature is usually high where you are located, and if so, that is very probably the cause of your failure. Melainotype plates being made of metal, more easily acquire and lose heat than glass ones, and consequently the thicknesses of your films would be more apt to vary. Hence, also, the ridges of which you complain. It is not improbable that a larger proportion of alcohol in your collodion might assist you by rendering evaporation a little slower.

You will be able probably to judge whether our conjecture is likely to be appropriate to your case, by considering whether those with whom you have corresponded are located in more temperate climates than your own.

With regard to the polishing with wax, you should have used white *hard* wax, not ordinary bees-wax, and the gelatine solution should not be too strong—three or four grains to the ounce of water are sufficient.

One thing more, which is hardly worth mentioning, except for your own sake. If your letters are sent, as in the present instance, without prepayment of postage, the probability is that we shall refuse the next, not being inclined to pay one shilling for the honour of replying to you in the Journal.—ED.]

EFFECT OF ETHER IN THE PRINTING BATH.

To the EDITOR.

SIR,—In writing to you on the 4th instant I find I omitted to state that I had added about two drachms of ether to the eight ounces of bath (for printing). I did not think it of any importance at the time, but I now find that therein lies the cause of the addition of ammonium to the printing bath producing no precipitate immediately, although after about ten minutes a slight muddiness, which slowly increases, is perceived. I observe that the addition of methylated spirit has the same effect. Apologising for my negligence,—I am, yours, &c.,

May 10th, 1862. P. P.

[The observation above made is worthy of record, as presenting at any rate a not well known phenomenon.—ED.]

ANSWERS TO CORRESPONDENTS.

☞ We regret to be again compelled to hold over Mr. Wall's admirable communication—*An Artist's Letters to a Young Photographer*. Among other articles in type is the conclusion of the series of chapters *On the Tannin Process*, by Major Russell.

D. C.—Bromide of cadmium will best serve your purpose.

C.—You can see some of Mr. Breese's stereographs at the International collection. See Leader.

W. & D. D.—Operators such as you desire are in great demand: we know of none at present disengaged.

REUBEN O.—We do not find that the arrowroot paper is popular—in fact, with the present infatuation for highly albumenised paper, it has no fair chance of success.

A SUBSCRIBER.—See report of the London Photographic Society's meeting in the current number. We shall probably also have something on the subject in our next.

R. JONES.—We have no practical experience in the daguerreotype process and therefore never met with the phenomenon to which you allude; but we should judge that it arose from electrical influence.

E. MATTHEWS.—Iodide of ammonium is, to some extent, soluble in alcohol, and is not precipitated therefrom on the addition of ether. If you use ordinary alcohol, which contains a small portion of water, you will find the ammonium salt quite sufficiently soluble.

S. L.—The larger lens will suit you best for your landscape camera. You will scarcely be able to manage without a sliding body for the portrait camera, as there is not often enough motion in the rack of the lens to suit great variation in distance between the sitters and the camera.

WOULD-BE SUBSCRIBER.—If you will send your address to Mr. Melhuish, 26, Haymarket, London, enclosing 13 penny postage stamps, he will return you a *printed catalogue* of all the pictures (about 1,800) belonging to the Amateur Photographic Association, from which you may select your specimens.

BETA.—We should recommend your *applying for advice* in open court of your municipal authorities, stating the circumstances. If there are any police magistrates and local newspapers, the mere publishing the facts will probably remove the grievance; but we have little doubt that you have a remedy by action at law, if you are inclined to resort to such a measure.

SCRUTATOR.—It is not a little singular that in *Punch* of the 3rd instant there is a capital illustration of the truth of the remarks which we made with reference to your specimens upon which you desired our opinion. In the admirable drawing of the figure of Peace seated upon an Armstrong gun, note how the idea of quiescence pervades the whole figure, one trifling point excepted—so very trifling as almost to escape notice at first: we mean the thumb of the left hand, which is a little too strained to be in perfect keeping with the fingers. Although a mere sketch, it is a capital study of pose for a photographic portraitist.

P. P.—We had not quite apprehended what you intended to convey: we did not presume that you had used the whole of the eight ounces of solution. The only explanation we can conjecture from the data is, that the crystals of nitrate of silver must have been preposterously acid. With regard to the ratio of speed between the three kinds of lenses which you mention, nothing but actual experiment could be depended upon for certainty; but we anticipate that No. 3 would be quickest, No. 2 a trifle slower, and No. 1 about half as long again as No. 3. We possess just such an one as you describe as No. 3, and it is as quick a lens as can be desired; in fact, an admirable one for ordinary portrait work.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 167, Vol. IX.—JUNE 2, 1862.

Iodide and Sulphide of Silver.—In the letter from our valued Paris correspondent, M. Lacan, which appeared in our last issue, is a statement which, if left altogether unchallenged, will probably subject us to some amount of what is vulgarly termed "chaff." Of course the assertion is that of Dr. Sabatier and not of our worthy *colloborateur*, who is merely the exponent of the learned doctor's explanation of his method of producing direct positives in the camera.

The use of the salts of cadmium and potassium in conjunction, if not actually claimed as a novelty, is advocated for a reason assigned to which we demur as *not proven* and inconsequent. Iodide of potassium instead of being, as alleged, the "slowest" of all the iodides used, is by some of the best English authorities believed to be the "quickest," when pure and freshly mixed; and this quality is not supposed to attach to the *iodide of silver* formed therefrom in the nitrate of silver bath, but from the accidental attendants upon its formation. Indeed, iodide of silver alone must be the same substance whether formed from one iodide or another, and can differ only in being associated with the various results of double decomposition. Now, if this doctrine be sound, the iodide of silver resulting from the simultaneous action of the nitrate of silver bath upon a mixture of the potassium and cadmium salts must be an uniform substance surrounded by, or in contact with, an uniform mixture of the nitrates of cadmium and potassium, and as such there can be no difference in the action under the developer of the particular particles of iodide of silver that are generated by each of the iodides employed under the circumstances detailed. At least such is our opinion, and we consequently find the explanation offered as the *rationale* of the experiment very insufficient.

We may remark that the association of the cadmium and potassium salts was practised several years since by our former fellow-labourer Mr. Hardwich, but for very different reasons to those now advanced. It was found in practice that a collodion sensitised with cadmium salts alone had a tendency to induce alkalinity of the nitrate bath after continued use, while that in which potassium salts alone were present had an opposite tendency: hence a judicious mixture of the two would, it was conjectured, conduce to greater stability of the collodion when iodised, and on trial this conjecture was found to be correct.

The use of sulphide of potassium as a toning agent for glass positives is not more novel than the application of the two iodides, nor is there any need to dread its injurious influence on the permanency of the glass proofs treated therewith; for, as Dr. Percy formerly remarked, sulphide of silver is a very stable substance when alone, and, further, as existing on the transparent positive, it is sure to be well protected by the varnish from the most active of the destructive agents. Perhaps some of our readers may be surprised to learn that we employed hydrosulphate of ammonia (which would act similarly to sulphide of potassium) successfully for toning positive proofs upon plain paper several years back, and we read a paper on the subject before the London Photographic Society, illustrated by specimens. The paper itself was published at the time in the *Journal of the Photographic Society*, and may be found in Vol. III., p. 237, by any who may feel curious about the matter. We may add that the tones produced upon plain paper were extremely good and pleasing. Upon albumenised paper we were not successful. But, unfortunately, though the proofs stood well so long as they were kept perfectly dry, the action of moisture was fatal to their permanency, the well-known yellowish hue being superinduced in exact proportion to the degree of humidity to which the proofs were exposed.

Why so stable a substance as sulphide of silver should thus change is not easily determined; but it is presumed that its intimate connexion with the organic matter of the paper in the proof, in addition to its finely-divided state, may have much to do with it. It is, however, evident that the same influence would not be exerted upon the substance forming the image of a transmitted positive upon glass: hence our reason for believing that no fear need be entertained of injury on account of such pictures being treated as described by Dr. Sabatier.

Photography and Periodical Literature. — There are few circumstances which tell their silent tale of the widely-spreading increase of our art more unmistakeably than the constant reference now made to it in the ephemeral literature of the day; but it is equally true that any article on the subject very rarely appears (except in the journals specially devoted to photography) in which erroneous, if not truly absurd, ideas connected with it, escape promulgation.

It was but recently that we perused an article, entitled "The *Carte de Visite*," in Mr. Dickens's popular serial, *All the Year Round*, published on the 26th of April last, which, as we anticipated, dealt with the subject in an amusing and jocular strain. But here, again, we were doomed to disappointment—not that we expected rigid exactitude in an article intended for sheer amusement, but the writer must needs, before concluding, wind up with what is evidently intended for a piece of serious criticism of some photographic works existing in his own imagination, and equally serious advice to the general body of photographic portraitists, whom our author coolly declares "do not yet quite understand their *trade*"!!!

It is, perhaps, unnecessary to observe that the word italicised is not so in the original; but it may help to a solution of the not very original instruction (!) which follows, consisting of commonplace remarks on the point of view and the importance of—what do our readers imagine?—*shadow!* Surely here is a discovery! But still more amusing remarks than these are to be found in the article cited. The author asserts of the selection of pose that "it is exercised by some of the best French photographers;" but of M. Silvy he says—"almost he alone in this country seems to understand the immense importance of *shadow* as an ingredient in a successful portrait."

We are quite ready to admit that, numerically, inartistic por-

traits may form a majority; but is it not equally true of every calling that those who pre-eminently excel are a minority?

One is constrained to wonder whether our original author ever saw the productions of T. R. Williams, H. P. Robinson, Mayall, Claudet, Kilburn, Hennah, Watkins, &c., &c., &c. Perhaps, if they would apply to him very humbly, he might be induced to form a class, at which they could attend and learn from him the immense importance of—shadow. The word shadow suggests its opposite, and surely a light breaks in upon us. Day and Martin, the celebrated blacking-making firm, used to "keep a poet." Perhaps M. Silvy—keeps an author.

Drawing-room Photographic Albums.—Perhaps one of the reasons why the card portraits are so popular may consist in the facility with which they may be mounted in elegantly-got-up albums, which are to be procured in such great abundance in every civilised locality. We think there can be no question about the probability that card portraits and the albums intended for their reception have mutually tended towards the popularity of each other. The possession of a few portraits naturally induces a desire to find a fitting receptacle for them, and nothing more handy than the albums, as at present in vogue, could have been devised for the purpose; moreover, they are in themselves so attractive in appearance that it is not surprising they are frequently selected for presenting to friends on the numerous social red-letter days which, by such gifts, are appropriately and gracefully recognised. Then comes the reactionary influence. Of what use is an empty album? Evidently it must be filled: hence the increasing demand for card portraits. We are not sure whether it might not be a paying concern for an enterprising photographic portraitist to present gratuitously some of these trifles (if judiciously done), trusting for remuneration to the natural desire to have the pages filled, and the probable increase of occupation to which such a desire gives an impulse.

An idea has occurred to us which we think worth throwing out for our numerous professional readers to act upon if they please, by which a fresh field may be opened up for the disposal of some of their productions. Why not get up some tasty albums in a similar style to those at present used for portraits, and constructed in a similar manner, but to receive *one* picture of a pair of stereographs? Depend upon it if such albums were in the market a host of negatives that are at present almost useless would be again available. In many stereoscopic negatives one of the pair may have become injured in use, and so inapplicable to stereoscopic purposes. A very large number of persons who do not possess, or do not care for, a stereoscope would be delighted with such an album as we suggest. Every one who makes a summer trip likes to preserve some record of the localities visited, and many who would not buy stereographs would gladly fill an album. It may be thought that any size would do; but great success is to be anticipated, not only from uniformity of dimension, but from the existence, also, of a large stock of views to commence upon. We are convinced that this idea is worth working out.

ON THE PRACTICAL WORKING OF THE PANORAMIC LENS.*

By George Dawson,

Lecturer on Photography at King's College, London.

This paper is meant to be thoroughly practical. I do not, therefore, intend to discuss the scientific principles on which the panoramic lens has been constructed; nor, indeed, is this course necessary, inasmuch as Mr. Sutton, the inventor (to whose papers I refer you), has on several occasions fully entered into that portion of the subject, and explained the circumstances which compel the use of a curved glass for the reception of the negative. For my own part, I confess that the extraordinary appearance of the whole apparatus, so different to the traditions and ordinary requirements for the practice of photography, prejudiced me strongly against the estimation of it for practical utility. The difficulties attending the coating with collodion and evenly developing curved surfaces seemed to me almost insurmountable, and it was with strong misgivings as to the result that I determined to spend a few days of my holiday in trying the capabilities of the lens, and how far the difficulties above indicated could be overcome. I have succeeded beyond my expectations, and can now truly say that there is no pleasure greater than that of agreeable disappointment. The specimens before you, good, bad, and indifferent, are my first attempts. Some of them—the architectural for instance—in subject and treatment are far from artistic, and evidently unfitted for the panoramic lens; others again, such as the general landscapes (deducting for faults of inexperience), have a breadth of effect and completeness totally unobtainable by aid of any other form of lens. I was well aware before commencing operations of its unfitness for rendering pure architecture; but I wished to satisfy myself, by experiment, of the extent of error and distortion arising from the necessary curvation of the glass. On examining the specimens you will observe that, except in cases where a straight row of houses runs across the plate, the horizontal curvature is quite inappreciable by the eye, and I can vouch for it that for ordinary landscapes the effect is apparently perfectly natural.

I now proceed to the principal object of this paper, viz., the practical details. My short experience of a few days will not warrant me in saying that my mode of procedure may not be considerably modified by future practice and improvement in the apparatus. On the latter point I have some suggestions to make, which will fall in their proper place at the close of this paper. It would have been more satisfactory to myself, and probably to you, could I have been able to lay before you a larger number of specimens; but it was impossible for me to get together more than eleven plates, on all of which I took pictures once, and some twice. Failures are awkward things to deal with in any way. I shall not detail mine; but if the instructions and precautions about to be given seem in some respects too minute, you may be assured they are for the purpose of avoiding failures experienced by myself.

The Camera and Lens.—The camera having two spirit levels fixed at right angles on its upper surface—a plan, by-the-bye, I should like to see introduced into all cameras—is readily adjusted to the level. The lens when unscrewed in the middle should be filled with distilled or boiled spring water. If ordinary water be used the consequence will be that, in the course of an hour or so, the air contained in the water agglomerating into a multitude of little bubbles will adhere most obstinately to the inside surface of the lens, and cause irregular refraction and confusion in the image. Care also should be taken that the stop inside the lens—an ingenious contrivance called, I think, the "*butterfly stop*," from its not bearing the most distant resemblance to that insect—be adjusted with its longer axis quite horizontal: this is in the direction of the greater length of the plate.

Cleaning the Plates.—The plates should be ground or roughed on the surface all round, to the distance of about $\frac{1}{10}$ inch from the edge. This may be readily and quickly done by filing a rectangular notch in a piece of copper—an old penny piece will do very well—and rubbing along the edge with some rather course emery powder and water. The collodion will hold on to this rough part with great tenacity, and prevent, what is otherwise almost inevitable, the total destruction of the film during some part of the after process. The thorough cleaning of the surface is a much more difficult operation than with plate-glass, arising probably from its being originally unpolished. Nevertheless, the fact is certain, and recourse must often be had to strong solution of soda, and afterwards nitric or sulphuric acid, to remove the last traces of dirt. In all cases, when the plate has once been varnished, strong acid will be required to remove impurities from the rough edge of the glass. A padded cushion for the purpose of polishing is sold along with the apparatus; but I have found it more convenient to dispense with this, and in one hand, covered with chamois skin, to hold the plate and polish with the other.

Coating the Plate.—The collodion should possess no glutinous or contractile properties, and still contain a large proportion of alcohol to allow the film to set slowly, and thus give more time for covering the plate evenly. The operation will scarcely be intelligible from a mere description. I hold the plate in the left hand balanced on the tips of the fingers and steadied by the thumb of the same hand resting with gentle pressure against the corner. Pour on that end a body of collodion sufficient (but not in great excess) to cover the whole: then with a tremulous motion of the hand, which prevents streaks, and by gradually tilting the held end, direct the wave of collodion evenly and slowly till it reaches

* Read at a meeting of the North London Photographic Association, May 21, 1862.

the other end. At the moment of its arrival there, pour off the excess from the corner into the bottle; but this must be done very quickly, and the plate turned back into its original vertical position, otherwise ridges will be formed diagonally across, and will be very conspicuous in the finished negative. Excite in the usual way.

The time of exposure seems to me to be rather less than that required for Ross's 4½-inch single lens. The longest exposure, under a rather dull leaden sky, was 20″, and the shortest, under more favourable circumstances, 2″ or less—in fact, as fast as I could open and close the shutter. Still you will observe in the latter cases very considerable detail in the dark green foreground, and the driving clouds in the distance show their outline and shading very distinctly.

The Development.—First, with pyrogallic acid.—Dilute a one-grain-to-the-ounce-of-water solution of pyrogallic acid with four or five times its bulk of water, which pour over the plate in the same manner as the collodion was applied. Tilt it backwards and forwards till the picture has begun to develop evenly all over. A stronger solution, with a few drops of nitrate of silver solution added, may then be applied without danger of streaks and uneven development, until the requisite intensity has been obtained.

Second development, with iron.—In some of my preliminary experiments I developed with pyrogallic acid, and would have continued to do so from choice had not my collodion contained a pretty strong proportion of bromide, which I find contributes much to slowness and to thinness of negative with that developer. I had no alternative, then, but to use an iron salt; and as, under any circumstances, it is rather difficult to cover even a flat plate always evenly with that solution, the difficulty is much increased in the case of a curved surface. I have therefore devised and constructed, very roughly as you see, a kind of rocking dish of gutta-percha, the bottom having the same curve as the plates. Two ounces of about a fifteen-grain iron solution poured into this was amply sufficient for one negative. The plate, gently dropped in and quickly rolled about, will develop very evenly. The iron solution thus used need not be thrown away, but with the addition of another ounce or so will serve over and over again without any seeming bad effects. The negative may now be washed gently; intensified to the proper degree with pyrogallic acid and silver; fixed in the usual way, by pouring on and off a saturated solution of hypo.; and, finally, well washed.

It was occasionally inconvenient for me to intensify immediately after the iron development, on account of scarcity of water, and for other reasons. Under such circumstances I fixed with hypo., after the application of the iron developer, partly washed, and then stowed the plates away in the box for future treatment at home when more at leisure. I am not sure but this mode of re-development gives a more vigorous picture than the other, provided the iron developer has acted long enough to bring out all the details: it is, at all events, more convenient for field-work. It requires great care and some precautions, but may be safely done in the following manner:—

After drying and slightly warming the plate by the fire, apply with a camel's-hair brush Sœhnée or other varnish all round the edge to the depth of one-eighth inch or thereabout, taking care to fasten in the same way the edges of all incipient cracks or rents in the film. This prevents water, &c. from finding its way underneath the collodion, and renders it so strong and adhesive that the plate may now be washed without danger and intensified to any extent with pyrogallic acid and silver.

Having thus detailed, I hope clearly enough to be understood, the manipulations I have found to be the best for insuring good negatives, I would now suggest some improvements in the apparatus which will make this object more easily attainable.

With respect to the lens and camera nothing better fitted for their purpose could possibly be devised. They are perfect. The former, being only rather over five inches focus, gives exquisite definition to the very edge of a rectangular field 9¼ + 4¼ inches, comprehending an angle of about 105 degrees; and the camera is in every way well fitted for giving effect to this enormous angle. In one of the specimens on the table—*Pulteney Bridge*—I had the curiosity to measure the angle included after trimming the print for mounting. It was rather over 97° and is of course pretty nearly the same in all other cases.

On the other hand the material of the bath—gutta-percha—is apt to contaminate the nitrate of silver (especially in warm weather) with organic matter. I do not see any formidable difficulty in constructing receptacles of glass covered only externally with gutta-percha; or, indeed, what prevents them from being cast in solid glass? I object also to its shape. The sides, as you may observe, are arcs of two concentric circles of nearly the same radius as the curve of the glass. The practical effect of such an arrangement is, that during the act of immersion or removal of the plate, unless extraordinary caution be used, the film is liable to come in contact with the inner surface, and suffer injury. I propose that the side against which the plate leans should be of the same curve as, or rather larger, than the glass, and the opposite side an arc of a much larger circle, or indeed quite straight. We can thereby prevent the least chance of any part of the sensitised surface from becoming injured by coming in contact with the sides. A larger quantity of silver solution will necessarily be required; but that I consider not only no disadvantage, but an actual gain, inasmuch as the bath will keep in good working condition for comparatively a much longer period.

Plates, Defects In.—If I call your attention now more closely to the specimens on the table, you will see that some of them are sharp and well defined up to the very edge of one side of the plate, but less so towards the other end. This arises from no defect in the lens—which, as I have said before, seems perfect—but from some slight variation in the curve of the plates. A variation of less than $\frac{1}{12}$ inch in the curvature will throw the image considerable out of focus, when working with a lens of which the range of focus from near to distant objects is very limited. I feel certain our glass manufacturers can easily get over this difficulty, so I need say no more about it. In all other respects a limited range of focus is advantageous, for, the point of best definition having been once ascertained and marked, no more focussing is required.

Allied to the previous defect, and partly dependent on it, is the difficulty of obtaining an even pressure on the printing-frame. No matter how many folds of flannel or felt may be interposed between the prepared paper and the pressure-board, there will still be some part of the proof not so well defined as the sharpness of the negative would lead us to expect. An air-cushion of Macintosh cloth, or other air-tight material, and covered on one side with thin felt or fine flannel, seems to me a simple and certain remedy.

In conclusion, I trust Messrs. Sutton and Ross will receive these suggestions of mine in the same spirit in which they are offered, viz., a desire to improve and extend the use of a lens and camera which have proved highly satisfactory in my short practice, and which in subjects of a particular class will, I believe, exercise no small influence on the future of photography.

ON THE EQUIVALENT FOCUS OF PHOTOGRAPHIC LENSES, AND THE ANGLE OF SUBJECTS INCLUDED.*

By Thomas Grubb, M.R.I.A.

Having in my late communication on this subject stated my ideas on the course best calculated to arrive at a general and useful solution of the question, I shall, with the exception of a short digression, confine my present letter to the consideration of "what a lens will cover" in the limited sense in which the question had been previously entertained in your pages.

The digression just alluded to I feel to be required in consequence of Mr. Dallmeyer's assertion, so emphatically announced in his late letter, respecting the *four degrees* of "displacement of objects" at either side of a picture, including 40° when taken with a single combination lens. Now, if Mr. Dallmeyer be correct in this assertion, two things follow of necessity:—

1st. A view subtending 40° to the optical centre of such a lens will have its picture subtending 32° *only* to said centre.

2nd. Two pictures of the aforesaid view of 40°, one taken with a single combination and the other with his triplet lens, of no distortion (both lenses being of the same equivalent focus), will differ in size by a quantity corresponding with the difference of 32° and 40°, angular measurement.

Now, assuming for a moment all this to be true, there is no visible reason for Mr. Dallmeyer introducing his statements in a letter purporting to be one in reference to "what a lens will cover," except we are to understand that he means to take the angle of *picture* for and instead of the angle of *view*, and thus to persuade us that a lens which actually includes 40° of view only includes 32°; or, perhaps, he chooses to consider the word "cover" in the *non*-useful sense to a photographer. I therefore think it best once more to emphatically remind the photographer of the *useful* as well as *proper* interpretation of the word "cover" in the question at issue, viz., that it refers to the angular extent of *view* included, and has no reference to the size of the resultant *picture* or the angle which *it* subtends to the lens.

* Continued from page 188.—Received 10th May, 1862.

But rejecting that which, for the sake of argument, I had assumed to be true, I desire to close this digression by a statement which photographers who have single combination lenses would do well to place in juxtaposition with that of Mr. Dallmeyer respecting the 4° on each side of a field of 40°—viz., that I intend to show in my next communication that the said distortion instead of being 4° is *not* 1°; and in fact is *little more than a sixth part of what Mr. Dallmeyer has so authoritatively asserted.* If the lens had the distortion attributed to it by him it would, indeed, be not much better than useless lumber.

In resuming the consideration of the question of "what a lens will cover" (well or ill), I would firstly describe one or more of the most simple and obvious methods of ascertaining the same for any individual lens:—Procure a camera of about double the linear dimensions in its field which the lens under trial is understood to be generally adapted to cover, and, in attaching the lens, take care that no part of the camera interferes with the extreme lateral pencils. The field of the camera must be at least so large that when the picture is taken the negative will show four "blank corners;" but it will save subsequent calculation if it also show blank ends. The camera should be placed *level*, and the lens central; and in taking a photograph rather a smaller-sized stop than ordinary should be used. A long line of house-tops, with their usual accompaniments of chimney-tops, at a distance of not less than 100 times the focus of the lens, the camera being placed at a window, or so as to bring the line of chimney-tops into the horizontal line of field, are favourable circumstances for trial; and if some defined object—as a window, a chimney-top, &c.—occupy the two extremes of field on the horizontal line, so much the better.

A photograph being now taken, showing at least the "corners" to have been unaffected by the lens, place a theodolite on the camera, or in its place, and measure the angle subtended by those objects the images of which are found in the negative to occupy extremes of the field. The angle so measured will (if the photograph show blank edges close to where the images are situate) evidently be the angle of circular field included or covered by the lens. Should, however, blank *corners only* be present in the photograph, we must have recourse to a calculation, for which reason I recommend the camera to have a field sufficiently large in the horizontal direction to show *blank ends* in the photograph.

Observations and Modifications on the Foregoing Method.

A theodolite not being within the reach of every one, the following substitute is capable of abundant accuracy:—Lay a straight ruler edgeways on the top of the camera, or on a level board occupying its place: bring the ruler into line with one of the two objects whose angular distance is to be found: draw a line on the board parallel to this position of the ruler: do the same for the other object, and measure with a protractor, &c., the angle formed by these two lines.

Another and a better mode of obtaining the angle sought is by using the camera instead of the ruler, as follows:—On the centre of the focussing-glass draw a vertical line: bisect one of the two objects—or, rather, its image—in the camera with this line: draw a line on the board or table parallel to the camera's side, and do the same for the other object, and measure, as before, the angle of the two lines thus obtained.

The advantage of obtaining the angle of subject included by the method described (or its modifications) is that, while it is very simple in principle, *no debateable elements are introduced;* its disadvantages being that it requires a camera having a length of field almost double that which would be required for the same lens used in ordinary.

I would further observe here that it is not necessary, in using this method, to *take a picture*, as we may *view it.* It will be found, however, that the *visual* determination of the extreme field is still more open to uncertainty from its shadowy nature than the *photographic;* besides which, we have in the one case no record for comparison, while we have a very effective record in the photograph. The *visual* observation of the "blank" (or dark) corners is best made by viewing them at a considerable distance—say several yards—from the camera.

It is, perhaps, unnecessary to observe that the measure of the field covered within the blank margin must, from its penumbral character, be more or less indefinite, and that the larger the aperture of stop used the greater is the indecision, and *vice versâ.* It is, therefore, desirable that some standard for the size of stop used in such experiments be adopted. Now, when the focus of the lens is about fifteen inches, and the angle of view included is 40° or upwards, a stop of half-an-inch aperture is probably as large as can well be used. This would give say one-thirtieth part of the focus of the lens as a standard for the size of stop for trials of lenses of varying foci; and, as lenses *of the same kind* increase in foci, they cannot be expected to include quite proportional angles, so those experiments (especially if they be comparative) which are made with lenses of nearly equal foci will be, *cæteris paribus*, the most valuable.

Having now shown how the question of "what a lens will cover" can, in its simple form, be readily experimented on, and sent you a couple of very rough negatives on paper to show that a single combination can be made to cover more than a triplet of a first-rate maker, I reserve the more general consideration of the question for my next communication.

ON THE PRESERVATION OF SENSITISED PAPERS.*

By M. Hermann Krone.

Our practical studies upon this subject have clearly demonstrated that sensitised papers do not keep perfectly by merely being dried and placed in a box, but that it is indispensably necessary to maintain also in the box a feeble current of gaseous chlorine which converts the recently-reduced particles of silver into chloride of silver. It is on this account that we have never been able to preserve our highly-albumenised papers, after sensitising, in boxes containing chloride of calcium alone, while chloride of lime employed alone in our boxes has always yielded highly satisfactory results. A mixture of these two bodies—

3 parts chloride of calcium,
1 „ chloride of lime—

enables us to keep our sensitised albumenised papers or printed proofs for a much longer time than is ever necessary; for, of these two bodies, the latter perpetually exhales gaseous chlorine, and the former absorbs all moisture that may be present.

Let us further add that an *excess* of gaseous chlorine causes the paper to lose all its gloss, and diminishes the sensibility of the chloride of silver—that is to say, brings it into the state of pure chloride of silver without an excess of nitrate of silver.

Papers thus preserved print much more easily and acquire richer tones in the chloride of gold bath. The traces of nitric acid liberated during this preservation seem to us to exercise no adverse influence on the paper, while it all remains dry; and, provided the prints be well washed previous to toning, we have found our preserved prints retain perfect purity in the whites, without the slightest tinge of yellow. We cannot say the same thing of paper preserved by chloride of lime alone; for these proofs acquire, after a short time, slightly yellow tints in the whites, especially when the chloride of lime has become moist and watery through long use.

The more completely the paper is impregnated with salted albumen, or the more the albumen contains chloride of silver produced by sensitising, the more difficult becomes the preservation of the paper, and the greater the necessity to add chloride of lime to the chloride of calcium in the box: the thinner and more superficial the film, the more readily will the paper remain white, even without artificial preservation, and when it is kept only under a press. A paper in which the albumen has been coagulated previous to sensitising keeps much better than one not coagulated; for albumen (like all organic bodies) reduces the salts of silver to the metallic state more slowly when it is coagulated than it does when in the soluble state.

PRACTICAL INSTRUCTIONS FOR GRINDING LENSES.†

At the commencement of these articles, page 58, we mentioned the use of a sink lined with lead or slate, in which the rough tools are placed when bringing the glass roughly to form, and intimated that, in addition to the prevention of more mess than was absolutely necessary, it was intended to subserve another purpose which would be explained hereafter. We now give the explanation, which is, that it is intended also to collect, for future use, the emery employed in the first roughing operation; and this rough emery, by being abraded in the roughing operation, becomes more or less reduced to a finer powder, and a portion of it consequently becomes fitted for finer operations. Of course that which is worked over into the sink is mixed with abraded particles of glass and other extraneous substances. This is all, however, collected and carefully washed in the following manner:—A large earthenware pan, capable of holding several gallons, is nearly filled with water, and the emery, &c., from the sink is added and well stirred up for some time with a stick. It is allowed to settle for three or four minutes, to permit the emery to subside, the coarse

* From The *Bulletin de la Societé Française de Photographie.*

† Resumed from page 85.

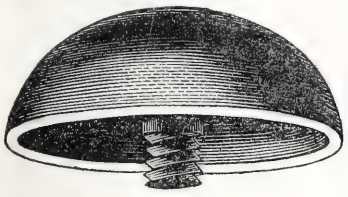
particles of which entangle and carry down with them those that are more finely divided, while the glass and other foreign matter is left diffused through the water, and this may be poured away as useless. After repeating this operation with fresh quantities of water two or three times, the process of separating the emery itself, according to the degrees of fineness, may be proceeded with.

Six or seven pans similar to that already in use are to be procured and ranged in order side by side. Water is poured into the first, and, after being well stirred up, the whole is allowed to settle for about thirty seconds, and the still turbid liquid is poured off into pan No. 2. Water is again poured into pan No. 1, and stirred as before. The water in No. 2 is then poured into No. 3, and then that from No. 1 into No. 2, just emptied. No. 1 is again filled and stirred, No. 3 is emptied into No. 4, No. 2 into No. 3, and No. 1 into No. 2. This operation is continued until all the pans are full, and the sediment is allowed to fall in each. Of course the quantity left will be greatest in No. 1 and least in No. 7, the former being the coarsest and the latter very fine. These washings are carefully preserved for future use.

It may be remarked that the harder the glass used for the formation of the lenses the greater the quantity of fine emery that is produced, and the more it is in demand.

It will now be in due course to describe the method of grinding concave lenses, which, when intended for the purpose of achromatising convex lenses of crown or plate glass, are usually made of flint glass. Many of the details of manipulation are almost identical with those employed for convex lenses; but of course there are certain modifications introduced of necessity when the central part instead of the edges of a disc of glass has to be ground away.

The "tool," instead of being in the form of a basin or cup, as before described, is, in this instance, more like a mushroom, and is represented below. The method of its construction is precisely the same as adopted for the convex tool, being first turned in the lathe out of a piece of hard wood, from which pattern a casting in iron or brass is taken, the screw cut in the boss, as in the former instance, the metal tool turned in the lathe to as correct a curve as possible in that way, and finally brought to a true figure by being screwed on to a post and ground with emery by aid of the corresponding tool for convex lenses. The operation of grinding is much easier with the tool for concave lenses fixed to the post than by reversing this operation, as the whole of the hand of the workman is able to grasp the glass or tool in this case, and to exert considerable pressure upon his work.



As in the case of convex lenses, three tools of the same curvature are generally in use in the optician's workshop—one for roughing, one for figuring, and one for polishing.

Besides convex and concave surfaces, others that are perfectly plane are required by the optician, the natural surface of the glass not being sufficiently true for optical purposes. Of course it will be understood that plane tools will be required for plane surfaces, but one set of these will do for various sized lenses; whereas, each curve requires its own special tools. Great care must be exercised in grinding and polishing a plane surface, in order to avoid making it untrue near the edges of the lens, which are apt to become abraded unduly. Sometimes to avoid this inconvenience small pieces of waste glass are cemented all round the edges of the lens, which are removed after the lens is finished.

When lenses of large diameter are to be ground, it is customary, after the tools have been well figured, to divide their surfaces into somewhat more or less irregular square portions by cutting channels right across the grinding surfaces, at right angles to one another. The object of these channels is to serve as receptacles for the surplus grinding material—the emery powder—which is otherwise apt to accumulate in parts, and interfere detrimentally with the due figuring of the lenses.

In constructing achromatic or diactinic lenses, the components —that is to say, the convex and concave lenses—are usually cemented together by means of Canada balsam, applied when the lenses are hot. The precautions to be observed in heating the lenses have already been pointed out.

The consideration of the forms and relative powers of lenses for photographic purposes forms no part of the object of this series of articles, but belongs rather to theoretical optics, the scope of our present mission being fulfilled if we have made clear the mechanical operations involved in the grinding of lenses.

THE MICROGRAPHIC ALBUM OF M. A. L. NEYT.*

THE taste for microscopic studies has considerably increased of late years. The degree of perfection which has been arrived at in the construction of the apparatus has, doubtless, contributed largely to this result; but while many persons seek in this pursuit the simple gratification of natural curiosity, others (aiming at higher and more serious objects) have enlarged the domain of science, and, like new Columbuses, have discovered an entire world, the existence of which had hardly been conceived before.

M. Neyt, in a previous number of the *Bulletin*, has enabled us to appreciate some of the difficulties attending the reproduction of *Infusoria*. Our readers will remember the ingenious application of electricity there made for the instantaneous fixation of the image of the animalcule at the moment of its appearance in the field of observation. This was certainly one of the most fortunate results of the process. The optical instruments should, doubtless, possess the most minute conditions of exactitude and perfection; the photographic substances destined to receive the luminous impression should also, on their part, offer quite special qualities; and in these different directions there had formerly been great researches to make. But these difficulties once conquered, there remained only to overcome the instability to which enlarged images are subject when projected on a screen, and when the enlargement is very much out of proportion to the size of the negative—the slightest vibration of the instruments inducing a jumping movement of the image, making it three or four thousand times as large: the rolling of a carriage or the slightest wind communicates to the house in which the operation is conducted movements which, if they are only the hundredth part of a millimetre, are sufficient to disturb the image in proportion to the enlargement by dispersions of several centimetres, and the image is not secured because it is disfigured.

The engraver invariably gives erroneous ideas on the subject of proportions, while direct reproduction, as worked by M. Neyt, guarantees almost a mathematical accuracy. It happens, also, that very important organs of the *Infusoria* become modified at certain stages of their existence; thus, for example, those bodies distinguished by naturalists under the name of *nucleus*, which is known to represent the sexual organs of the female of these animals. It is not absent at any stage of the existence, but its characters are very different according to the time that the examination is made. Now, this organ plays a very important part in comparative physiology, since, from the constitution of the *nucleus* of *Infusoria*, a conclusion has been arrived at contrary to that which had long been accepted, viz., that these animals are in no way excepted from the general law which regulates reproduction in the chain of organic life.

To continue:—The *nucleus*, which, by its transparence, its fragility, and its polymorphism, has often misled the most competent draughtsmen, is found most perfectly rendered in the prints of M. Neyt. We speak equally of the pulsating vesicles and of the ciliæ which play such an important part in the organisation of *Infusoria*. The importance of that process will be readily understood which admits of the immediate securing, without preparation or without deformation, faithful images of the various changes of the ovule and the spermatozoa which it contains, samples of which are easily obtained by treating the *nucleus* with acetic acid or other reagents.

Regarding them merely as objects capable of gratifying natural curiosity, the proofs produced by M. Neyt are not less worthy of attention; they afford the most fantastic unravelling of monsters, without analogues among the larger animals. Here are the *Acari*, which cause the itch in man and horses. Their mouths are terrible suckers; their entire bodies bristle with an armour of points; their paws are terminated either by suckers or by claws, to assist them in attaching themselves to their victims. M. Neyt shows them to us enlarged to 122,500 times, which allows us to become acquainted with their most minute organs as easily as we can distinguish the parts of larger animals, and with that immutable exactness of photography which is here their principal merit, and which leaves no room for the least uncertainty. Here also are the *Acari* of the scarab and the xylocope, and many others; for each animal nourishes its peculiar parasite, and these in their turn are not exempt from the law of nature—*eaters and eaten!* *Diatoms*, also, are presented to our notice—bodies which possess no less interest to the simply curious than to the savan. *Pleurosigma* in lanceolated rhombs, striated obliquely with an admirable regularity, and whose real size is about the 250th part of an inch, are here enlarged almost 150,000 times; the *Triceratium*, an aggregation of little

* Condensed from the *Bulletin Belge de la Photographie.*

globules arranged in a triangle; the *Arachnoidiscus*, from Peruvian guano, a marvellous *Diatom* of a roseate form, whose elegance and richness of colouring are but faintly recalled by the splendid windows of our cathedrals; *Grammatophora subtilis*, enlarged 1,800 times, the image of which, enlarged to this proportion, is not far from three-eighths of an inch, which does not however prevent the distinguishing certain regular designs resembling some of the letters of the alphabet—a fact which gives to these *Infusoria* the name which they bear.

Imagination loses itself among these ciphers. We remain lost in wonder as we reflect that these infinitely minute beings possess organs almost as complicated as our own, arteries to circulate fluids, instincts, a nervous system, a brain capable of a certain action, and to which nerves having a degree of tenuity which can hardly be imagined transmit certain sensations and certain volitions; and that not only do they possess the organs necessary for supplying their most elementary wants, but they have scales of a most brilliant colour, graceful appendages, elegant streaks and markings—in fact something for ornament and beauty, independent of utility, properly so called.

The effects of polarisation, obtained with certain substances, possess also deep scientific interest; and these reproductions lose a great deal by being deprived of those colours which constitute the principal attraction of the phenomena of polarised light.

ON THE STUDY OF THE ELECTRIC SPARK BY THE AID OF PHOTOGRAPHY.*

By Prof. Ogden N. Rood, of Troy, N.Y.

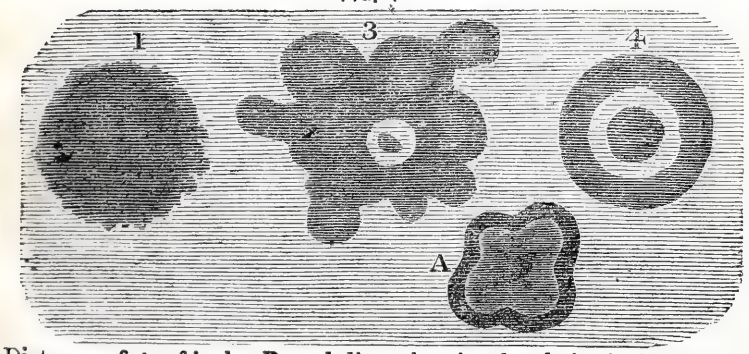
Form of the Negative Spark when Drawn from the Prime Conductor by a Short Metallic Rod.

The production of Lichtenberg's figures has been considered as indicative of a real difference between positive and negative electricity. Riess, who has examined this subject with great care, found that, in addition to the marked difference in the two forms, the diameter of the positive figure is to that of the negative as 2·77 is to 1. The same physicist has lately made an elaborate examination of Priestly's rings, which are formed when a large number of sparks strike on polished plates of metal, and arrived at the conclusion that the set of rings generated by negative electricity is quite different from that produced by positive.† It consequently becomes very interesting to ascertain whether such difference also prevails between the photographs of the two sparks.

The apparatus was arranged as before and sparks of negative electricity fell on the sensitive surface.

The form of the negative spark was found to be quite different from that of the positive: it was destitute of rays, circular in shape, and often made up of a number of minute circles placed without symmetry. For short distances it was much larger than the positive spark, and never nearly so well defined.

FIG. 4.



Distance of $\frac{1}{10}$ of inch. Round discs showing by their shading indications of internal structure. *Fig.* 4. 1.

$\frac{2}{10}$. Similar to above.

$\frac{3}{10}$. Discs broken up into a number of small circles. See .3.

$\frac{4}{10}$. See diagram .4.

$\frac{5}{10}$. The same as above: sometimes the form at A is produced.

$\frac{6}{10}$. No spark passes over: the partial discharges produce no figures, but merely a general blackening of the plate under the developer.

If the sensitive plate be placed on the prime conductor charged with positive electricity, and sparks be drawn from the surface of the plate, the negative figure is produced: if the plate rest on a conductor charged with negative electricity and sparks be drawn from it, the positive form is obtained: and finally, if the plate be coated on both sides with collodion and insulated with a brass ball before and behind it, one of them being also insulated, while the other is in communication with the ground—if now a spark of either kind of electricity be allowed to pass from the insulated ball to the plate, and from the plate to the second ball, we obtain, as would be expected, on the opposite sides of the plate, the negative and positive images by development.

It is well known that when the knob of a jar, charged with positive electricity, is touched by a thin plate of pitch, a yellow star-like figure is produced by sprinkling the plate with a mixture of powdered sulphur and red lead; while, if negative electricity be used, a rounded red figure is formed. These figures bear the name of their discoverer, Lichtenberg. The method employed by Riess is much better calculated to give accurate results than the common one just mentioned. A small square plate of copper is coated thinly with black pitch on one side: the point of an insulated metallic rod touches the centre of the pitch surface, while the other side of the plate is in metallic connexion with the ground. If now a spark from a jar charged with positive electricity be allowed to pass over to the pointed rod, and the latter still insulated be removed, then, by sprinkling the pitch with a mixture of sulphur and red lead, the star is generated in great purity. Very perfect red negative figures are, of course, formed in a corresponding manner.

In repeating these experiments after the manner of Riess, I was struck with the resemblance existing between the red negative disc and the photographs of the negative spark. There is also much general resemblance between the positive yellow star and the photographs of the positive spark. This is greatly heightened if the yellow positive figures are produced in the following ways:—The pitch plate is held at such a distance from the ball of the prime conductor that no spark can pass over, the machine is turned and the brush is allowed to strike it for an instant. On powdering the plate a multitude of small yellow stars very much like the photographs appear. They are often surrounded by small red circles, such portions having become negative by induction.

The results obtained with Leyden jars, and in a partial vacuum, as well as by the use of metallic plates, I propose to detail on a future occasion.

* Concluded from page 192.

† Pogg. Annalen, vol. cxiv., No. 10, p. 163.

Exhibition Gossip.

PORTRAITURE:—RESUMED NOTICE OF THE SOLAR CAMERA AND ENLARGED PORTRAITS, BRITISH AND FOREIGN.

In writing these gossipping papers you must know, my dear reader, I am perfectly conscious that I am doing a very unusual thing. Our modern oracles, the critics, like those of an elder time, are most frequently heard without being seen: they bestow the laurel or inflict the lash—praise their friends—denounce their enemies—or create both the one and the other—from behind the shield of the anonymous. In defence of this practice it may be urged that the critic who writes of a friend's or an enemy's productions (and who amongst us is without such friends or enemies?) can denounce or praise them the more honestly and impartially from the fact of his being unknown; and that there must be many reasons why a critic should hesitate either to praise or denounce, however justly, the works of a friend or an enemy, if that enmity or friendship chanced to be a well-known fact. On the other side it may be said, and very truly, that, shielded by an anonymous position, specious ignorance may usurp the place of knowledge—prejudice that of impartiality—and superficial acquirements assume the complexion of first-rate connoisseurship; and that, by misleading the public, and thus lowering the artist's standard of excellence, such *soi-distant* critics may do an incalculable amount of mischief. Now, without pretending to be very oracular or learned, I do earnestly hope to establish a character for honesty, and I am perfectly willing to run all risk of misrepresentation and all chance of detraction if my efforts only blend successfully with those of others associated together in these pages for the advancement of photographic art. I have, therefore, paused here before resuming my remarks upon the pictures at the International Exhibition, just to point out the above considerations, and to say in a blunt, straightforward way—"Here am I, and there are my opinions: take the latter for no more than your knowledge of the former convinces you they are worth."

Once more, then, we are in the Exhibition. Forcing our way through mountain waves of crinoline, which hem us in on either

side, we struggle out of the crowd towards the miserable hole in the wall through which we reach the British photographic part of an apartment. We go up the stairs leading direct to the photographic end of the room this time; but, as we reach the last few steps, we stop alarmed! What are these—so gloomy and so strange in their appearance—that look not like the ornaments of a staircase, and yet are on it? A placard informs us that they are "photographic backgrounds!"* and, shrugging our shoulders, we pass on.

As we go we cannot help wondering a bit. First, we wonder how photographers can associate with their beautiful, truthful, and exquisitely natural images, things so glaringly, staringly, brazenly defiant of the most simple and rudimentary elements of drawing, *chiaroscuro*, taste, composition, and perspective. Then, remembering that in none of the *carte de visite* portraits exhibited in foreign departments is there any evidence of such abominations existing among the photographers of other countries,† we wonder what such photographers must think of us when they find themselves greeted on the very threshold of the British photographic department by such abominable specimens of bad taste and inartistic ignorance. Lastly: we wonder who is responsible for their presence in such a place, where space was so precious, and from which such a crowd of would-be exhibitors were excluded.

This, however, you may think, has nothing to do with the enlarged portraits of which I ought to be speaking. Nevertheless, it has, for the wall of this staircase was the very best place on which the life-size productions could have been exhibited; while as they are now situated, so narrow is the lane between the screens, that you must either examine them by kneeling down, or half break your neck by throwing your head back to do so. On the wall of the staircase life-size pictures might have been viewed from the proper distance, and seen as only such pictures can be seen to advantage; while the space they now occupy might have been filled with smaller productions, best examined from a nearer stand-point. I cannot help thinking that chance had a great deal more to do with the arrangements of this department than any other quality, although it is a sad thing to say, considering the importance of the task and the men who undertook it. But where are the "forty-graphy cat-logue" boys? Hushed are their voices, so few were the visitors! A microscopically small, hurriedly-written pen-and-ink notice informs us that catalogues may now be obtained at the educational end of this solitary and deserted room. Alas! is it not the sign of our realised expectations? No! the room is not quite deserted; for on a chair in one corner is a respectable female—*fast asleep!* The signs multiply. Undisturbed, save by the startling fall of a paint-brush close to our feet from the hand of a solitary workman perched up aloft, we continue our labour. How the great heat has affected some of the apparatus! There is the top of a Leake's tent twisted and curled like a piece of baked paper; and many of the cardboard mounts, despite glass and backboards of frames, are in a similar condition.

Before quitting the solar camera productions we may as well briefly notice some large portraits taken direct in the camera. The finest of these specimens are those exhibited by Mr. T. C. Newcombe—vigorous, brilliant, and round: if they have any fault it may, perchance, exist in a slight leaning towards hardness. Next to these in merit are those exhibited by Maull and Polyblank; but, from wanting more perfect gradation of half-tints in the flesh, the heads lack roundness—otherwise they are very bold and effective. Among the most inartistic of these are the "half-life-size" portraits of Cramb Brothers, one of which is specially remarkable for the fact that if the figure chanced to be cut in halves, each half would be an exact *fac-simile* of the other.

Let us now make our way to the south-west gallery, and see what the Frenchmen can show us in the way of large portraiture. * * Well, here we are. The French have fewer pictures but much more space, and we find the place tolerably full of visitors. Mayer and Pierson have a fine show of life-size pictures, some of which we have seen before at the rooms of Mayer Brothers, in Regent Street. We have little—perhaps nothing—in this way to equal these. Some are untouched; but most of them are largely indebted to the brush of the artist. Some are described as being taken direct in the camera; but most of them are enlarged from smaller negatives. I must stop here and recommend those who are engaged in "touching" photographic portraits—as it is termed—to take a lesson from the touched pictures of Mayer and Pierson. Our touched pictures are, as a rule, simply spoiled pictures, in which all the beauty and truth of the photograph is sacrificed to a love of tea-boardy smoothness, smart, dexterous manipulation and metallic polish. These touched pictures look like the untouched pictures executed by Williams; and that is about the highest praise you could award them. They look *unlike* any thing but a photograph, whereas ours commonly look *like* anything but a photograph. M. Claudet's pictures are evidently of the same school; but while this gentleman's have a weak, feeble, washed-out aspect, those in the French department have—although none the less soft and delicate—quite sufficient vigour and force of effect. Disdéri exhibits some very fine life-size pictures; but these being hung high and fairly in the line of the light, one bobs about in vain to get a good look at them and escape the blank opaque white glare of light on the glass. M. Alophe—who describes himself as both painter and photographer—also exhibits some very fine enlarged pictures; which, however, display but little artistic feeling in the general effect of pose and arrangement—much less, indeed, than those of exhibitors who style themselves simply photographers. Pierre Petit exhibits one very excellent large production; Deblane and Lelarge exhibit some very good large photographs obtained direct in the camera; and some equally good productions (enlarged) are also exhibited by Count Olympe Aguado, and by Viscount Olympe Aguado.

From the French gallery—still in search of large portraits—we make our way to the north-west portion of the building, to examine the Austrian photographs. Some splendid untouched and very large portraits, taken direct with Voigtlander's lens, No. 8, are exhibited here by Ludwig Angerer. Although sometimes wanting in delicacy, these pictures are as a whole strikingly brilliant, round, and forcible, their great fault being an almost utter want of artistic feeling and effect in the arrangement of the sitters and accessories. The printing and tone of these are admirable. Some of the smaller of Angerer's enlarged photographs are exhibited in an album, which should certainly be examined. If your fingers should be silver-stained you will see how anxious the good-looking, intelligent youth in charge of them will be to turn over the leaves for you, or how promptly he will plant immediately before you a significant "please not to touch," in large and *very* black letters.

From the Austrian—being in the immediate neighbourhood—we next go to the Russian photographs. Denier, of St. Petersburg, contributes the larger number of life-size photographs here, and very beautiful they are. They are certainly touched—some slightly, some scarcely at all; but, like Mayer and Pierson's, they are touched with the most extreme care, delicacy, and genuine respect for the photograph. One or two of the vignettes have the heads relieved by delicate bits of clouds melting tenderly away into the white of the paper, thus destroying harsh contrasts between the stronger darks of the portrait and the white of the margin, and tending to unite harmoniously the former with the latter. This effect seems to have been got in the original background, which probably was all white, save the delicate bit of clouding before which the head of the sitter was placed.

It may not be taken amiss, perhaps, if I interrupt progress here to tell you how I have managed to get an effect precisely similar. Give the centre of a plain white background a coating of size, then work in, with soft white chalk and prepared charcoal, your delicate bit of cloud, and, to prevent it rubbing off, put this part of the background before a good fire so that the size will melt, and in again becoming cold and hard, of course fix the chalk and charcoal. This is a similar method to that sometimes adopted for fixing powder colours on paper prints.

But the finest enlarged prints, as pictures, are some life-size half-length portraits, which are not yet hung. They are finished in chalk, and are the most artistically beautiful things in the Exhibition. One of *An Artist at Work in his Studio* is marvellously striking for life-like roundness, breadth of *chiaroscuro*, and general force of effect. It is just such a portrait as we might expect from the hands of Vandyke himself. The background is made up with casts and other accessories of a painter's room; but all, in their subordinate relationship, giving character without robbing the head of its prominence, or the composition of its breadth. There is no feebleness, no want of power here, and still less is there anything approaching coarseness or hardness. This picture should certainly not be overlooked by the photographic portraitist. A *Portrait of a Lady*—a bust rather larger than life—by the same artist, is an excellent picture, too, but wants balance in the composition; and, to some extent, considering the subject, delicacy in the half-tints, although the pose is very picturesque, and the general effect very harmonious and pleasing. M. Fagans, of Warsaw, ex-

* In the Catalogue these are described as "*artistic* backgrounds."

† Pictorial backgrounds will be found in very many of the foreign *carte de visite* pictures; but they are sketchy and indefinite, falling into their places *behind* the figure instead of thursting themselves impertinently *before* it; and, above all, they show no such execrable drawing—no such conflicting lights and eccentric, lawless patches of shadows—as deform these.

hibits some large brilliant prints, which have much vigour and distinctness, but too little softness and modelling. This artist has also two other pictures which seem to attract a large share of attention. G. de Rumine exhibits some fine large pictures, which he describes as photographed on canvas in carbon.

The department claimed by Belgium being handy we adjourn to it next, where we find some very splendid life-size portraits by Ghémar Brothers, of Brussels—a whole length of *le Comte de Flandres* being among the finest that we have yet seen.

From Belgium to Denmark is now so short a distance that we are there in "something less than no time," and find some good enlarged pictures by George E. Hansen, of Copenhagen, touched here and there, but very slightly, with a sharp-pointed black crayon, the colour of which assimilates very closely to that of the photograph.

Getting into the south-west transept we find photography from Bavaria, and are at once attracted to the small enclosed space in which are exhibited the magnificent life-size photographs (touched) sent by J. Albert, of Munich. One of a dog is very real and laughably natural, besides being a beautiful photograph. Not to fatigue you I will here close my present communication. In the next we will finish this "Gossip" about the large pictures, and turn to the remaining branches of photographic portraiture.

A. H. WALL.

ON THE URANIUM PROCESS.*

By M. Hermann Krone.

The best and most rapidly printing papers, giving brilliant results under good negatives, are always those which in the first instance have been treated with a solution of nitrate of uranium (one of nitrate to seven of water), dried rapidly, and immediately placed again, for one moment only, on the surface of the same bath. These sheets remain good for a long time when they are contained in a dry, dark box. After one year they have lost a great deal of their sensibility: they give then results which readily distinguish them from good proofs, by their decreased vigour, and by the yellowness of the whites, which never disappears, and which becomes, after a few days, under diffused light, of a reddish-brown. It is impossible to fix these proofs by ordinary washing like proofs upon paper recently prepared.

In order to obtain the most beautiful and vigorous proofs we prolong slightly the exposure to the sun under the negative: we develop with a solution of nitrate of silver of one-half per cent., slightly acidulated with nitric acid, with a subsequent addition of ten per cent. of alcohol. The print is then washed with distilled water, and toned in a bath containing one grain of chloride of platinum to 1000 grains of water. The proof is allowed to remain in this bath only a few seconds, and, when it is observed to blacken and acquire the necessary vigour, it is briskly removed, to wash it rapidly with a copious supply of water. By this means the principal part of the picture is retained on the surface of the paper. The vigour may be further increased by rapid drying, waxing, and varnishing.

ON DR. HENRY DRAPER'S HOT WATER PROCESS.†

By E. Borda.

Your remarks respecting the rapidity of tannin plates, developed by Dr. Draper's hot water process, suggests a point which it is of great importance to ascertain.

Is a tannin plate developed by that process quicker, or even as quick, as a wet plate? I am of opinion that it is far from having yet been proved conclusively: it is a complex problem to solve. The difficulty arises from one singular fact, which every practical tannin worker cannot fail to have discovered. The rule so often given, that the exposure required by a collodion worked with tannin is a constant multiple of the time required by the same collodion used wet, is not confirmed by experience, It may appear so with a slow collodion, the margin of exposure of a tannin plate developed cold being so wide; but with quick collodion it does not hold out. A collodion rapid wet, is not proportionally as rapid with tannin, compared with a slow collodion.

I have found collodion which was very rapid wet to be fully as slow with tannin as some collodion which would have required, if wet, many times the exposure of the former to give a similar result. Tannin appears to equalise the length of exposure, and the merit as to rapidity of a collodion used with tannin is to be found on a different basis from the same quality being possessed when used wet. How far this property may be extended to other dry processes I am not prepared to state, but I have fully tested it with tannin. It is not to be inferred from this that a collodion may not be found which, while very rapid wet, will be equally so with tannin. As a general rule, however, it is a mistake, and therefore the photographer must not rely too much on the rapidity of a collodion used wet to govern the exposure of his tannin plate prepared with it.

After making a first attempt to develop some tannin plates by Dr. Draper's process, and meeting with no success, I repeated the experiment, and it resulted most encouragingly, with an exposure shorter than under the same circumstances the same collodion would have required wet at the time the plate (four months old when exposed) was prepared. This would naturally lead me to the conclusion that Dr. Draper's process is quicker than wet collodion if the fact above-mentioned had not been well known to me. Here is a new and vast field open to the experimenter. As to loss of sensitiveness by time, it is so slow that in four months I have been unable to detect any.

My complete failure, at my first attempt, to develop by Dr. Draper's process arose from several causes. I used the water too hot, the developer too cold, too much silver and proportionally too little citric acid. These are all important points which, while they add to the difficulty of developing a tannin plate successfully without some practice, becomes with skill and judgment elements enabling the operator to control the best result with more certainty. I have, in a former communication, stated how the exposure could be carried much further than was strictly necessary to obtain a well-defined negative without injury, provided the development was regulated accordingly. Dr. Draper's process increases the margin in the opposite direction. It seems as if almost any exposure within reasonable limits, either very short or very long, could by judicious development give a good negative with a tannin plate.

The temperature of the water in which the plate is soaked before development is a new element, and a never-failing indication enables us to regulate it. The same developer gives a different tint to the negative according to the exposure, which tint alters from bluish-black to bright purple red, and is the more red that the plate has been more over-exposed. This same sensitive indication applies to the hot-water process, a proper tint being soon ascertained with a constant developer and too high a temperature having the same effect as too much exposure, so that if the image appears too red the temperature is too high. Really almost every day reveals, in the beautiful tannin process, the most useful and interesting features.

I thought that the enemy after abandoning his Munson Hill and wooden guns, would be satisfied with the "madness" of his pursuers and abandon the field; but introduces two redoubtable champions which "Siccus" is perfectly willing to meet, with as many more as he or they wish to enlist on fair ground. Sellers tells us that Mr. R. Shriver has come to the conclusion that *nothing but the wet collodion* can give the superb delicacy of shades the wet always gives. This is rather sweeping. If Mr. Shriver has given a fair trial to dry processes, and to the tannin in particular, his opinion is the more worth quoting that he is an excellent photographer, and his stereographs amongst the best I have ever seen; but, if he has not, his conclusion has no weight. The same applies to Mr. T. R. Peale, who *assumes* the wet to be the most perfect condition of the collodion film. I would for ever regret that the ephemeral condition of collodion (wet) should prove the most perfect. But an assumption may do to discuss abstract questions: it becomes an axiom when self-evident. In the present instance it amounts to nothing.

The relative value of the different processes must be established by a comparison of the results they give. Two years ago, a Committee being appointed to decide for a prize photograph amongst the many productions at the Manchester Exhibition, a print by Mr. Mudd, from a Fothergill negative, was decided to be the best. Repeatedly prints from dry plates, albumen, collodio-albumen, tannin, &c., are mentioned in the accounts of the different exhibitions through Great Britain as deserving the palm. The albumen transparencies of MM. Ferrier and Soulier, from albumen negatives, have not been surpassed. Nor are dry processes a "*madness*" or a "*fashion:*" they are older than the wet, and used far more extensively for field-work. Therefore I would conclude by stating, what no one can deny, that the relative merits of negatives obtained, wet and dry, are at least an open question, and to be decided by time and careful comparison, and not by mere assertions.

WHERE TO GO WITH THE CAMERA.*

By Our Own Pioneer.

ROUND ABOUT THE CORNISH COAST.

This remarkable ruin (Boscastle), and all connected with it, seems to increase in interest every year. The "Idylls" and popular romance of the blameless King Arthur and his table round have given additional importance to the scene, and rendered it more than ever famous by the gifted Laureate's creations. Enid, with the "meek, blue eyes;" Elaine, the lily maid of Astolat; evil Vivien, witless Merlin, and sorrowing Ginneveré—come fresh to the imagination while looking on the ruins. The singular romance of old Nordens with respect to the island, and the doings of Uter pen Dragon, the father of Prince Arthur, are fully entered into in the works of Carew, Hals, Whittaker, and Tanner's *Notitia Monastica* for Cornwall.

By the side of the cliff, looking towards Penzance and the Gull Rock, the gearing of a slate quarry, called "Gillow," rises, as it were, from the deep; while the dash of wave upon wave, with broad serpentine streaks

* Continued from page 193.

* From the *Bulletin de la Societe Francaise de Photographie.*

† From the *American Journal of Photography.*

of woolly foam, can be taken by any instantaneous process with marvellous effect—in fact, the advantage of placing the camera is almost peculiar to this place. The variety of paths and windings in the sides of the cliffs leading to and from the quarries is not to be met with on any other part of the coast: similar effects may be seen, but there is no getting at them. Passing further along the line of cliff, and keeping the tower of Endellion church in view, a second quarry, called "Lamb's House," is arrived at. Here, in addition to the bold and massive craigs, overhanging some hundreds of feet, you have the usual quarry appendages of whyms, brattices, stages, pulleys, chains, girders, groinings, platforms, strutts, and supports, all of which form massive and distinct foreground objects. Move about twenty yards to the left, and from a mound near the quarry path you have a fine picture of broken foreground, the undulating middle distance relieved by occasional bits towards Port Isaac and Endellion; while, stretching away to the extreme right, Newland Quay, Pentire Point, and the Gull Rock, fill out a most interesting subject. More than a dozen pictures may be obtained between Tintagel and Trebarwith. At the latter the sands and deeply-indented cliffs are truly magnificent. These cliffs rise in some places to an immense height; while darkly-shadowed hollows, of twenty or thirty feet in diameter, break away underneath, giving, in a bright sunshine, powerful contrasts of light and shade. The sands at any time are first-rate objects. If the tide is up, you have the play of waves advancing and retreating on the rock-strewn beach; if the water is low, you have picturesque groups of men shovelling up sand, with boys driving along strings of donkeys loaded with the same in baskets or crates. A smack or fishing-boat close in shore occasionally adds to the picture.

Above Trebarwith Sands is the village of Trenow—a place apparently built anyhow: its quaintness and irregularity make it a great object of interest to the photographer. Cottage gables, of rough rude masonry, with all-on-one-side chimneys and flagged slate tops, are here to be found in perfection; deep windows, broad doorways, with pent-house falls, covered here and there with creeping ivy; irregular broad stone steps, dwarf walls, with old rough oaken gates and palings, and a choice of distances (land or seaward), offer many good stereoscopic bits of effect.

A winding path from the village of Trenow leads down to the new road and turnpike, and, in a distance of about a mile, the artist will find more than a dozen pictures worth taking—the most prominent of which will be Harvey's Mill from the road, with a high background shutting out any room for sky; the mill and house, flanked with some graceful ash trees; the water-wheel and leet-course a prominent object. Further on to the right, a deserted quarry, somewhat similar to the one described at Bowithick, will make two or more good pictures. Every wind and turn in this road will give some subject of interest.

Leaving the deserted quarry, pass the bridge for about 100 yards, when a sharp turn to the right (up hill) leads to Rockhead. Here, from a gate, two fine views may be had—the first looking towards the sea, with Tintagel Church appearing on the brink of the cliff, the island rising some short distance to the right, the cottages at Trenow, with their picturesque gables and roofs, coming out on the left—Trebarwith in the foreground, with the ravine and valley beneath. Turn round, without moving from the spot, and you have a circular engine-shaft, engine-house, and water-wheel (with large massive portions of rock and slate lying about in confused heaps), a high furzy background completing the picture. Further to the left, a water-wheel of large size, with wooden water-course and timber supports, with the usual accompaniments of mine machinery and mine gearing, may be taken. Here there would be fine scope for the panoramic lens and camera in the sea view, with Tintagel Church in the distance. I have often noticed that when the view has been clear and well-defined, the clouds and sky have been flat and tame, making it a matter of much uncertainty as to getting the view and sky equally good. It is in such cases as this where artists and photographers would find the advantage of tinting in a washed sky to the proofs, or printing in one to suit the view.

The view above described has evening skies, or early morning ones, of great beauty, while the foreground and objects are misty and ill-defined. All these pictures would require a tent for the wet process, as the distance from any cottage or house is too great. Innumerable odd bits of immense projecting rock, covered with ivy and weed—a bend of a road, the rise of a hill, or a gap in a hedge—may be here found in perfection.

Returning to Tintagel, the artist's attention should now be directed to the subjects near the village. Leaving the lane that leads to the Castle and the newly-built house on the left, follow on towards Boscastle to the first turning, leading to a field or down, called "Rocky Park." Here is a bold, massive, projecting bluff, called "Willa Park," with rugged, precipitous sides, ofttimes magnificently illuminated by the rays of the setting sun, giving a glorious picture of solitary grandeur. Further on is Willa Park Point, with an old tower on the top, overlooking the deep, dark abyss, called the "black pit," and a rugged, precipitous line of coast, dreary promontories, and sandy beaches, with the great point of high cliff rising above 700 feet, the desolate heath, called "Tresparrot Down," rising upwards of 800 feet above the level of the sea—the immense elevation causing the rough land below to have the appearance of a level surface. From this point the tower of Trevalga Church comes in as a good object for the photographer, though not very noteworthy for the antiquary: it was given by Bishop Brewere to his Chapter of Exeter in 1242.

Passing down to the cliffs below the church another slate quarry will be found, affording several good pictures. In the village are several old Elizabethan houses, well situated for delineation; while near Valency Bridge is a fine rock section, full of contortions, and the carbonaceous mineral to which the colour of slate is attributable. Another immense indentation will be found close at hand called "Bossiney Haven," one portion of the rock on the left having an aperture washed through by the sea, that gives it the appearance of a rude pillar and arch. This subject makes two fine pictures right and left, either from the flat sands or a turn in the rocky descent, where there is a most convenient bank of rock and turf to place the camera upon. Two large masses, called the "Sisters," here stand out detatched from the main, with a fine curl of wave and spray playing about the sides and base: here is good shelter to put up a tent for the wet or instantaneous process. These views, with the broad blue expanse of the Bristol Channel, the restless sweeping and breaking of foaming surge upon the silvery sands, together with the rugged and fantastic indentations of the rocks, give subjects of great interest peculiar to this coast alone.

Passing into the main road, a lane on the left towards Tintagel leads to the far-famed Tresillet waterfall, better known as "Nathan's Cave"—to antiquaries as "St. Nighton's Kieve." A board nailed on a high pole directs to the farm-house where the key is kept. This waterfall is an immense cascade tumbling through a gully in the rocks and boulders from a great height, pitching down to the ravine below in noisy confusion. From the darkness of the recess and overhanging brushwood the light is much obstructed. On the upper part of the bank, and overlooking the fall, are the roofless remains of some old habitation of bygone times, portions of the walls still remaining, covered with vegetation, and the subject of much curious tradition; some conjecturing it to have been a religious cell of hermit or recluse, who devoted himself to a life of fasting and prayer in behalf of shipwrecked mariners. Another account ascribes it to have been the residence of two mysterious ladies who had evidently seen better days, but of whose history all were in ignorance. None knew whence they came or their mode of life. After a few years of solitude and sorrow the eldest of the strangers died, and the survivor was also found, a few months afterwards, locked in the embrace of death, her grey head resting on her wasted, shrunken hand.

Returning to the main road by the valley several subjects present themselves that any good dry process is fit to cope with, as the place is quite free from interruption, and little offering that is at all liable to move—Baker's Mill and Brown's Mill, with the overlapping craggs, being both good subjects. These places in and about Tintagel and Boscastle have been visited by few, geologists and antiquaries having been the principal visitors to this wonderful land of rock and ravine, metal and moorland. As railways intersect crowded and busy places only, they cannot be expected to penetrate but by slow degrees to those parts of England where the population is small, the towns detached, and the country exceedingly broken and irregular; consequently artists and photographers have but seldom visited this locality of romance and beauty, owing to the difficulty of access.

About three miles from Tintagel is Boscastle or Forrabury, a place of some note in Henry VIII.'s time. Bottreaux Castle was the baronial dwelling of the lord of that name: little now remains but a neglected mound. The new roads that have been cut within the last few years around and about this most romantic spot are highly favourable for photography, as their position and elevation enable the artist to direct the camera towards many capital subjects that could not have been taken from the old low road of former times. The tower on Willa Park Point, built by the late lord of the manor for pic-nic parties, is a capital place to plant the camera and operate with the wet process. In many places around, the rocks of Boscastle have been washed into caverns of one and two hundred feet in depth by the sea, where parties enter in boats and then light up torches to hunt seals. The church is an object of much interest, with a tower of three stages without moulding or capital—a *silent* tower, the bells having been lost in a storm at sea within sight of the coast. The rector of Morwinstow, in his poem, the "Silent Tower of Bottreaux," alludes to the subject:—

> "The ship rode down with courses free,
> The daughter of a distant sea;
> Her sheet was loose, her anchor stored,
> The merry Bottreaux bells on board."

On nearing the land, the pilot heard his native bells at Tintagel ringing out a merry peal, thanked Heaven for the prosperous voyage and the apparent certainty of reaching the port in safety by the evening tide; but the captain, a wild, reckless, Paul Jones sort of fellow, turned his piety into ridicule and desired him to thank Heaven on *land*, but at *sea* to thank a good captain. Barely had the words passed his profane lips when one of those fearful storms peculiar to this part of the coast arose, and the ship was driven with fearful violence on the rocky gulph of the black pit, going down with the captain, bells, and crew. The pilot with much exertion swam on shore and was saved. The sound of the bells was heard in the pauses of the storm, like a muffled peal for the fate of the vessel; and now, in the fearful tempests that assail this rock-bound place, the sound of the bells is said to be distinctly heard: so that the *silent* tower with its legend, is a more useful warning to the living than a full harmonious peal.

There are several inns at Boscastle, and many private houses where accommodation can be obtained. The place is so full of objects fit for the camera that a week might be spent there and many subjects not then be taken. The entrance to the harbour, with Pelley Point to the right and the Old Tower to the left, is a bit perfectly unique in its way, the slate-rock here having been wave-washed into more than the usual jagged forms. Long Island and the Macher Rock—immense detached masses—are a short distance off. A couple of miles or so from Boscastle you come to the church of Lesnewth—very interesting, of Norman, early English, and perpendicular features. Not far from this will be found another church, called "Minster," in a very picturesque and secluded spot. One fine landscape subject in particular, with a fall of water at least 150 feet—a small foot-bridge in the lower part of the valley, a single plank resting on an immense block of stone, rude hand-rail, with a couple of stunted ash trees—make a good effect for the stereoscope. On the rocky masses, in various parts of the valley, the heath, shield fern, columbine, bergamot, mint, several kinds of mosses, fern-few, wild madder, and a great variety of other plants, grow in luxuriant profusion, and heighten much the effect of the landscape pictures. On Tresparrot Down road are several old cottages of more than usual excellence; and close to the road side the Down itself, with the old finger and directing posts, grassy mounds and furze heaps, with the distant cliffs and homesteads, present some fine distinctive bits, the broken ridges and heaps giving strong shadow and effect to the foreground. Here, in a round of about seven miles, more than one hundred pictures might be taken by any process (wet or dry) with ease and certainty—including subjects of rock, glen, and moorland—not to be excelled in any other part of the kingdom.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

THE IMPORTANCE OF LINES AS ELEMENTS OF EXPRESSION, HARMONY, MOTION, BALANCE, BREADTH, REPETITION, &c.—THE BALANCE OF LINES.—LEADING LINES OF A COMPOSITION.—CONTRASTING LINES.—UNITY OF OUTLINE.

"Weigh part with part, and with prophetic eye
The future power of all thy 'lines' *descry*."—*Fresnoy.*

"It is the essence of composition that everything should be in a *determined* place, perform an *intended* part, *and act in that part advantageously for everything that is connected with it*."—*Ruskin.*

MY DEAR FELLOW-STUDENT,

Points may attract the eye of a spectator, but of themselves they cannot retain it: *lines* both attract as points and, as lines, hold possession of the vision, which instinctively travels with them to their end. This power of guiding and retaining the eye of the spectator, as it were almost at will, is of rare importance to the artist. Availing himself of this fact, he has secured a new power to aid him in securing unity; in obtaining energy, action, and spirit, or otherwise strengthening expression; and in giving prominence, space, or depth, and other elements of pictorial excellence, grouped under the names of *Motion, Balance, Breadth, Harmony, Repetition, Subordination*, &c.

But lines are as dangerous for evil as they are powerful for good, if chosen in ignorance of pictorial laws. Run the eyes rapidly up straight even lines, and plunge them headlong over unexpected precipices, or keep them moving up and down parallel bars, like wretched animals in a cage, and you will very speedily disgust and weary their proprietors. Let your lines, on the contrary, undulate in a variety of graceful curves, and the eyes drink in a sense of freedom and gently flowing ease. They move over their smooth and harmonious paths as delighted with their insidious beauty as the ear is with similar swelling and sinking harmonies of sound. Still, the great ruling power of a picture is—as I said in my last—its *sentiment;* and the flashing lines and lightning-like angles of certain forms may be as effective and attractive, *when combined with according images*, as the more independent and sweetly-blending variations of curvilinear forms; while even a *judicious* use of repeating lines not only sometimes serve to express retirement, &c., but has a positive beauty of its own, in giving unity and expressing repose. In illustration of this quality, Ruskin points out how Turner applied the principle involved in several of his greatest paintings, and says:—"In general, throughout nature, reflection and repetition are peaceful things, associated with the idea of quiet succession in events: that one day should be like another day, or one history the repetition of another history, being more or less results of quietness; while dissimilarity, or non-succession, are results of interference and disquietude. Thus, though an echo actually increases the quantity of sound heard, its repetition of the note or syllable gives an idea of calmness attainable in no other way: hence also the feeling of calm given to a landscape by the voice of a cuckoo." Here, again, we see how perfect is the union between the eye, the ear, and the mind.

"But," says the non-artistic photographer, "of what possible use is all this information, when, owing to the peculiar character of my art, no *practical* good can be derived therefrom? I may polish and refine my taste, and I may strengthen and improve my powers of observation by such studies, it is true, but in these pages I want the practically useful; and as I have not the draughtsman's power of choosing lines how can I"—and so on, forgetting while he speaks that, although the lines of nature are unalterable in themselves, he cannot move his camera a few yards to the right or left of any view without effecting an immediate and striking, if not entire, alteration in the composition of its lines. Every trivial change in the position of the lens will vary more or less the combinations, character, and qualities of the line—concealing the jerky and angular, breaking up the too uniform and uninterrupted lengths of line—converting horizontal into oblique, acute into obtuse angles, and sometimes angles of the most formal and ugly character into curves of the most pleasing and attractive. There is one thing, however, very certain: if he does not understand these elementary principles of pictorial art, there is then small chance of his ever producing really artistic pictures, whatever our *confrère* (Mr. Taylor) may say to the contrary. Chance was not more likely to effect the newly-made inexperienced operator's process of exposure, development, and printing from negatives, than chance was likely to favour the Mr. Tom Pepper of the "Notes, Harmonious and Discordant" in his choice of light and shade, point of view, and general picturesque effect. Indolent people are apt to attribute to chance things due to hard mental labour, as a kind of excuse for themselves; and envious folk are prone to underrate the superiority of a rival as rather due to some lucky accident than to greater capability or energy. But I should be sorry to class Mr. Taylor with either the one species or the other.

THE BALANCE OF LINES next claims some explanation, which may, however, be very briefly given. If your composition shows a series of inclined lines all slanting in one direction, like the straight lines of your first copy-book at school, the effect will be strikingly offensive, because they are without balance or compensation; whereas, if one or two opposing lines be introduced, the equilibrium is restored, and the whole will probably group into a form more or less approaching the pyramidic. Thus all lines require to be duly balanced. If in a group of trees the stems have all one inclination, they must be varied, either by a change of position, by taking in some other object to restore the balance, or by effecting an actual alteration by the aid of some moveable feature of the view. The artist who has made up his mind to secure a certain scene will not be very easily baffled in carrying out its pictorial treatment. Mr. Robinson, for instance, carried a large water-worn stone some distance to aid the balance of his composition in my favourite photographic picture, *Early Spring*. In photographs we frequently see a want of balance in the arrangement of lines representing shipping, and many an otherwise good instantaneous sea picture has been ruined for want of attention to this law. It is not at all necessary in balancing lines that the quantities should be considered, as the question is not one of proportion but simply one of equilibrium. The lines of clouds, or waves, or those of rigging may frequently be used to get over difficulties in this way, when the straight masts of stranded boats, or similar things, present objects which it seems otherwise almost impossible to compose. On land we have many resources to meet such requirements in figures—cast shadows, broken branches, rustic implements of labour, large stones, &c., &c., &c. Balance is, of course, required in all the parts of a composition, as well as in the arrangement of lines.

THE LEADING LINES of a picture are such as at once conduct the eye to that point which is most interesting and important to the feeling or sentiment of the whole. To illustrate this let me refer to two or three well-known productions—Gericault's *Wreck of the Medusa* for one.* The great key to this work—the point which really tells the story, and gives reality and force to the effect—is a mere speck of a sail, seen fitfully upon the gloomy horizon between the rugged outlines of the heaving and sinking hills of water. Before us is a fearful crowd of dead and dying men. The living cling to the fragile refuge of their hurriedly-constructed raft; the dead lie in all their horrible rigidness of limb

* This picture will also illustrate the skilful balance of lines.

and ghastliness of hue, just as days ago they died, uncared for and unnoticed. We hear the sudden and frantic shriek of joy which announces "A SAIL! A SAIL!"—and we see how some start like galvanised corpses to their feet, and turn their wild eyes "o'er the sea"—how some struggle desperately, but vainly, to rise and prove for themselves the scarcely credible joy—how others turn their glazing eyes listlessly in the direction of promise, inaudibly sighing "too late, too late"—and how others, dead to all further joy or grief, deaf to all earthly sounds of hope or fear, brood like statues above their dead, giving no sign of life but the mechanical clutch which retains a corse upon the heaving raft, and the dull faint light which gleams in the vacant blood-shot eyes. How can that mere speck of a distant sail tear the attention from such a scene, and make it go at once to its seemingly most unimportant point? The few leading lines supplied by those eagerly outstretched arms do the work at once; and the eye no sooner catches sight of the picture than it flashes over the sickening terrors of the scene, and goes straight and swift to the tiny sail so full of delight and joy and life and comfort. This is one illustration. Another may be found in Leonardo Da Vinci's picture of *The Last Supper*, in which almost every line in the picture, the creases of the table linen, the beams of the ceiling, &c., all tend to one point—that in which the solemn tenderness of divine love irradiates the Saviour's gentle face. Another may be found in West's painting of the *Death of Wolfe*, where we see the victory which suddenly lights up the dying hero's eyes forcibly indicated with lines formed by the outstretched arms of the pointing figures and the episode to which they directly lead the spectator's eye.

CONTRASTING LINES.—Variety being a matter of no small importance, the lines should not fail to do their share of duty in this direction also—contrast being, perhaps, more important in the composition of lines than in parts of seemingly greater consequence. For the sake of contrast it is by no means illegimate or without good precedent to introduce lines entirely out of harmony, although the successful introduction of such discords require very great skill in the artist, in order that they should, while serving his higher purpose, not become too glaringly conspicuous or assume an undue share of importance. Ruskin says of the good painter: he gives "forms of the most rounded and melting tenderness; and suddenly, as you think by a freak, gives you a bit as jagged and sharp as a leafless blackthorn. Perhaps the most exquisite piece of subtle contrast in the world of painting is the arrow point, laid sharp against the white side and among the flowing hair of Corregio's *Antiope*." By studying the composition of eminent masters, we shall always find monotony in the chosen lines studiously avoided.

The importance of lines in aiding the expression, and their own peculiar qualities of harmonising and contrasting, we have already considered under other heads. So that we will now turn to the unity of linear composition.

UNITY OF OUTLINE.—While abrupt breaks and angular jerks may sometimes, for the sake of contrast, find a place in your composition, we ought so to combine and unite all the several lines of the component parts that they exist only as belonging to the whole. If you confine curved lines to this corner, oblique ones to that, circular to another, and horizontal to a fourth, you will have four several distinct parts; whereas if the lines of various kinds be intermingled and blended, or united in some predominating form, this will no longer be the case. "The character of the whole composition may be broken, or various, if we please, but there must certainly be a tendency to consistent assemblage in its divisions."

In studying from nature, apart from the resources already hinted at by which the photographer may overcome difficulties, he may also avail himself of shadows in which ugly or mischievous lines may be prudently buried, and of the outlines of shadows which frequently give valuable lines to the composition, or of the various forms of clouds. Unity of outline again demands that the principal objects grouped within the line their combination suggests should tend to form imaginary lines which also compose well. Various forms have been suggested to which these lines should tend, and in figure subjects such are generally adopted, but in landscape the great variety of objects and the vast number of their combinations preclude the possibility—even if it were desirable—of giving the preference to the few forms more generally recommended, such as that of the cone or pyramid, the oval, circle, &c. And here for the present we will conclude.

A. H. WALL.

Meetings of Societies.

MEETINGS IN JUNE.

3rd.—London, and Liverpool.
4th.—Manchester, Edinburgh, and Bradford.
6th.—Newcastle-on-Tyne.
12th.—Ann. Meeting South London, and Chorlton.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE final meeting of this Society for the Session 1861-2 was held at Myddleton Hall, Islington, on Wednesday evening, the 21st ult.,—George Shadbolt, Esq., Vice-President, in the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen were ballotted for, and duly elected members of the Society:—Mr. John Sinclair (of Tottenham), Mr. William Cornish, and Mr. John Turner.

The Treasurer (Mr. Hill) presented two proofs to the portfolio of the Society. The negatives were taken by the metagelatine process, and the subjects were *Malling Abbey* and *Steep Hill Castle*. The thanks of the Society were accorded to Mr. Hill for his gift.

The CHAIRMAN then called on Mr. Dawson to read his paper *On the Practical Working of the Panoramic Lens* [see page 204], at the conclusion of which, discussion being invited,

Mr. SEELEY, referring to the method of coating the plate described by Mr. Dawson, thought it possible that an unequal evaporation of the ether and consequent unequal drying of the film would take place through the contact of the warm fingers: it was therefore desirable that some means should be devised for holding the plate other than that recommended.

Mr. DAWSON replied that he avoided results such as those described by Mr. Seeley by keeping his fingers in constant motion, so that no one portion of the plate became unduly warmed.

With the view of meeting the difficulty the following suggestions were made:—

Mr. Moens—India-rubber finger stalls.
Mr. Shadbolt—A diagonal holder for the plate.
Mr. Bingham—A curved pneumatic holder

The CHAIRMAN further suggested that there was good reason for keeping the plate in a vertical position, owing to the superior gravity of the vapour of ether. The position suggested by Mr. Dawson was certainly the best.

Mr. HILL said he had always used a circular level with perfect success, and did not see that the one used by Mr. Dawson was any better.

The CHAIRMAN and Mr. SHAVE agreed in regarding the level as an unnecessary appendage to the camera, the former stating that he had always successfully levelled his camera without the use of such an instrument.

Mr. MARTIN's opinion being solicited by Mr. Moens, he (Mr. Martin) intimated that a circular or straight level might be useful or not according as it was carefully made and accurately fitted to the camera. The essentials in such an instrument were that the inner surface or bottom of brass and the inner and top surface of glass should be exactly parallel to each other; and, further, if the level were permanently fastened to the camera by cutting out a place to receive it, care should be taken that this surface should also be parallel with the two first named. When those conditions were successfully attained, he thought a level would be found a convenient and useful addition to the camera.

The CHAIRMAN and Mr. HILL, referring to the plan of diluting the developing solution suggested by Mr. Dawson, gave it as their opinion that it would cause many stains, especially in a curved plate, as there were parts which must inevitably be left dry.

Mr. SIMPSON, describing the plan followed by Mr. Heath, said that it consisted in first washing the plate with distilled water, and then adding that water to the weak pyrogallic solution before pouring it on the plate. If this were tried, he (Mr. Simpson) thought it would not be found to stain, especially if the bath were a new one.

Mr. REINER suggested that citric acid would be found better in the developer than acetic acid.

Mr. DAWSON replied that it necessitated a longer exposure.

Mr. HILL entertained the opinion, in reference to iron developers used in conjunction with hot water, that too small a proportion of acid was generally recommended: he had found it necessary to add a large quantity of acetic acid.

Mr. BINGHAM thought that diluting the developer would answer the same purpose.

Mr. HILL deemed it unnecessary to carry so many cloths for cleaning the plate. He had found one cloth, and some clean cotton wool for finishing off, amply sufficient; and if any flue came from the wool it might be removed by a camel's-hair brush.

Mr. SEELEY having suggested leather for the final polish,

The CHAIRMAN said there was a great difference of opinion as to the propriety of using leather at all. He (the Chairman) regarded it as a great source of dirty plates.

Mr. SHAVE would be glad to know if Mr. Dawson, after his recent experience with the panoramic lens, preferred a flat or curved surface?

Mr. DAWSON replied that he regarded the panoramic lens as a special lens for special purposes—as, for instance, the reproduction of a general view which it was desirable to have on one plate; but, for ordinary

landscape purposes, he thought the landscape lens in general use a very efficient instrument.

Mr. Moens thought it very desirable to avoid taking panoramic views on five or six plates, and would be glad to know the price of the curved plates?

Mr. Simpson: Eighteen shillings per dozen.

Mr. Dawson, in illustration of the difficulty of getting the plates of the right curve, showed one on which he had never been able to get a picture, as it always gave one portion out of focus; that plate was therefore of no use.

Mr. Shave inquired if it were not possible to attain greater accuracy in that particular by having recourse to the method of bending over a cylinder to the proper curve?

Mr. Simpson said that the original intention at the time of the invention of the camera was to have adopted that plan; but, as it had not been done, he concluded there was some insuperable difficulty.

The Chairman, *apropos* to the difficulty of getting the plates properly cleaned, as mentioned in the paper, conjectured that the plates had lines running in a longitudinal direction, arising from their being blown in a cylinder, while in crown glass such lines would necessarily be flashed out through the rapid circular motion imparted at the time of blowing.

Mr. Foxlee having heard that it was necessary frequently to re-fill the lens with water, said he would be glad to learn Mr. Dawson's experience on that point.

Mr. Dawson had worked only three days successively with the lens, and could not therefore give any very valuable testimony on that point: in that short time, however, he had not found it necessary to re-fill the lens. There was one point, however, of great importance, which was that it should be filled with *distilled* water, as if other water than that were used bubbles would be found to adhere to the lens, for which there was no other remedy than turning out all the water and beginning again; moreover, the curves of the lens were made upon the assumption that pure water would be used.

A Member having suggested the filling of the space between the lenses with alcohol,

The Chairman explained the reason of the unsuitableness of that liquid by reason of its inferior gravity and different refractive power. In reference to the form of the bath he conceived that its present form was imparted with the object of saving weight in travelling, and though the exception taken to it by Mr. Dawson had a very reasonable foundation, he (the Chairman) thought the difficulty might be met more conveniently than by making one side of the bath straight. He would suggest that the inner curve should be the arc of a circle having a longer radius than the outer one, and that the ends, instead of being finished off square, should be joined as the two horns of a crescent, thus: ⌒. In that way the plate could not strike against the sides in being withdrawn from the bath. Possibly, for a vessel of such a shape, they were limited, at least for the present, to the use of gutta-percha.

Mr. Simpson saw in that nothing to regret, since if the gutta-percha were pure, no action would take place on the nitrate of silver bath. He had had one in use four years, and had not observed any deleterious action take place.

Mr. Martin said he supposed that the bath spoken of by Mr. Simpson was one purchased some years ago, before adulteration was as extensively practised as it was by the manufacturers of sheet gutta-percha: the makers of gutta-percha baths for photographic purposes were dependent on the integrity of the manufactures of the sheet, and so long as that came into the market in an impure state, he (Mr. Martin) thought that the baths made with it were not suitable for containing nitrate of silver. He would unhesitatingly advocate the use of glass on all occasions.

Mr. Hill had found the gutta-percha baths sold by Messrs. Burgess and Key all that could be desired.

Mr. Simpson had been assured by the Gutta Percha Company that the material employed by them for making photographic vessels was quite pure.

Mr. Moens suggested ebonite as a suitable material of which to make the new form of bath for panoramic purposes suggested by the Chairman.

Mr. Dawson said that any member might satisfy himself on the point at issue with great facility. It was only necessary to prepare a thirty-grain solution of nitrate of silver; pour one-half of it into a glass bath, and the remainder into a gutta-percha bath; allow both to stand for three or four days, and then apply Mr. Barber's test—which he (Mr. Dawson) considered a very efficient one—for organic matter. He would remind the members that the method of applying that test consisted in making a portion of each solution slightly alkaline by ammonia, and then exposing to light. If that course were adopted with solutions from vessels such as he had described the difference would be obvious.

Mr. Simpson had applied the test suggested by Mr. Dawson, and, as he thought would be seen, in a rather more effective way. He had cut the gutta-percha into shreds and introduced them into a bottle containing nitrate of silver solution, which solution he had afterwards used as a nitrate of silver bath without having the result in any way marred by the presence of organic matter. He should mention, however, that he did not make the solution alkaline before exposing it to light, and the gutta-percha employed in the experiment was a guaranteed specimen of pure gutta-percha.

Mr. Dawson pointed out that the omission of the alkali was the omission of the real test: he assumed that there were some samples of gutta-percha which produced the effect usually attributed to organic matter, and others which did not do so.

Mr. Moens observed that Mr. Bedford had told him that he used gutta-percha baths.

The Chairman said he could not see any reason, either on the score of economy or cheapness, why gutta-percha should be used when glass was obtainable.

Mr. Bingham, with the view of meeting the gutta-percha difficulty, suggested that ordinary baths of that material should be varnished with a solution of pure gutta-percha; he was reminded, however, that shellac had been found so brittle as to break and crumble off, spontaneously, from the contraction of the gutta-percha.

The Chairman handed round some prints which had been presented to the Society's portfolio, by Mr. W. W. King.

Mr. Barber, by way of illustrating the caution with which recommendations to mix or otherwise use the collodion of any particular maker should be received, handed round a specimen of iodised collodion supplied by a maker whose preparation of that article usually remained colourless for a great length of time, but which in that and some half-dozen other bottles in his possession had spontaneously acquired a very deep colour.

The Chairman directed attention to some views lent to Mr. Hill by the Stereoscopic Company for exhibition that evening, also to the album of the Amateur Photographic Association. These engaged considerable attention and commendation.

Mr. Simpson showed a picture printed in iron and toned with pyrogallic acid, which so nearly resembled a silver-printed and gold-toned picture that it was difficult to distinguish the one from the other.

The Chairman, with the object of eliciting further discussion, asked if any member present had tried Mr. England's modification of the tannin process?

Mr. Seeley reported the results of his experiments, which were to the effect that though he had found the pictures develop rapidly they did not keep clean, nor did they keep well after exposure.

Mr. Simpson said his experience was opposed to that of Mr. Seeley: he had tried the process and was much pleased with the result. The plates developed cleanly and rapidly. He regarded it as a great improvement on the tannin alone.

Mr. Martin—to whom Mr. Simpson had shown his experimental negative—corroborated that gentleman's description of the satisfactory character of the result.

Mr. Barber had tried that process by dissolving his tannin in lac finish. He liked the result better than by plain tannin.

A Member said he would be glad to hear the opinion of the Chairman as to whether the honey had a chemical as well as a mechanical action in that process.

The Chairman doubted not but that such was the case, honey or grape sugar being recognised by chemists as a reducing agent. A remarkable illustration of that point sometimes occurred in working the honey process in warm weather: the exposed plate being set aside for some time would be found to have developed itself.

Mr. Simpson showed a proof from a stereo. negative by the tannin process proper, one half of which had been developed immediately after exposure, and the other half having been kept fifteen days. In the first instance a very good picture was obtained, and in the second a most confused blurr.

Mr. Barber said he had tried iodide of quinine *in* his collodion and sulphate of quinine as a preservative *on* his collodion instead of tannin, but with indifferent results.

Mr. Simpson exhibited a proof from a picture taken by the collodio-albumen process. It had been exposed forty-five seconds at half-past six o'clock in the evening, and had yielded a good picture by hot development, though the usual exposure would have been three minutes for ordinary development to obtain a picture of a similar character.

Mr. Hill thought there was a great deal of misapprehension as to the right temperature implied by the term hot development.

Mr. Moens believed that a temperature of 80° was the correct thing.

The proceedings terminated with a vote of thanks to Mr. Dawson for his paper.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

This Society held its annual meeting on the 13th ult.,—Mr. Walker in the chair.

Robert De la Condamine, Esq. was elected a member.

Professor Macdonald made some remarks on stereoscopic vision, in which he expressed his belief that the drawings of Jacopo Chimenti had been drawn for the purpose of producing stereoscopic effect.

The Secretary then read a letter to Sir David Brewster on the subject of these drawings, by Professor Tait, who occupies the chair of Natural Philosophy in the University of Edinburgh, and will be known to some of our readers as first wrangler at Cambridge.

The following is a copious abstract:—

"I have very carefully considered the Chimenti sketches, and I have concluded that they *must* have been drawn *with the intention* of making pictures of the same object from SLIGHTLY different points of view—in other words for a stereoscopic effect. From this it would appear impossible to think otherwise than that some form of the stereoscope, or (as is more probable) that some equivalent form of squinting, was known to the artist.

"Several competent authorities whom I have consulted entirely agree with me on this point.

"The case of the Chimenti drawings is different from that of the rude stereoscopic landscape of Professor Elliott.* In the former case a *known* figure is to be represented; and, therefore, when we find the drawings artistically constructed, so as to give six or eight different distances correctly, the chances of this result having been aimed at are very high indeed. It is very difficult to give anything like a satisfactory mathematical investigation of so vague a question; but I think the following simple calculation will give you an idea of the amount of the probability.

"Let us suppose that in copying by eye merely an artist may make with *equal*† probability any error lying within certain limits. Suppose, also, that a portion of the drawing will give the proper stereoscopic effect (approximately) if the error in it is not more than $\frac{1}{10}$th of the possible error.

"Thus the chance that five or seven distances (*one* of the six or eight being necessarily correct, however the pictures be drawn) are correct, may be called 10^5 or 10^7 to 1—that is, the probability that the pictures were drawn with a binocular intention is something like 100,000 to 1, or 10,000,000 to 1. You may feel quite justified, putting the exigency in its feeblest form, in asserting that *it is at least* 1000 *to* 1 *that the sketches were designedly drawn as views by separate eyes, or a single eye displaced.*

"In conclusion, I may again express my *complete moral conviction* that the drawings were executed to be used one by each eye—whether by ordinary squinting, or by the use of an instrument, it is of course impossible to tell; but I do not think this has much bearing on the important question of binocular vision, since if the squinting process was known 200 years ago, the invention of a stereoscope to help it is a small matter in comparison."

No remarks being made on the subject, the Secretary then read the following

Annual Report.

In accordance with the rules of the Society, the Council have to present their report at the conclusion of the sixth year of its existence.

They regret that it is not in their power on this occasion, as has previously been the case, to offer their congratulations to the members on the continued progress of the Society.

In common with many kindred institutions, and with the country at large, they have to lament the death of his late R. H. the Prince Consort, the patron of the Society. As is known to the members, it was considered to be the duty of the Society to present an address of condolence to Her Majesty.

The Council regret also to have to report that the monthly meetings have not been so successful as might have been expected in a Society holding so high a position, and including among its members so many ardent photographers. The Council are aware that an idea is generally prevalent, and has affected other photographic societies as well as this, that the object for which it was instituted has now, to a large extent, been fulfilled, and that the interest of the meetings and the usefulness of the Society will be partially nugatory until some new and important discovery is made in one or other of the departments of the art. While admitting that such a discovery would give a great impulse to the art, and necessarily increase the attractiveness of their meetings, the Council cannot avoid repeating an observation made by them on a previous occasion, that there is ample opportunity for maintaining the interest and success of the monthly meetings, in the free and unreserved communication by members of the results of their investigation and experience in connexion with known processes; and they would again urge upon members to assist them in this way in maintaining the efficiency of the Society.

Looking to the experience of the past year, the Council are disposed to recommend that in the meantime the regular meetings of the Society should be limited to three, to be held on the second Tuesdays of December, February, and April; and that, in addition to the reading of papers, an effort should be made to add to the attractiveness of the meetings by the exhibition of works, interesting from their novelty or successful manipulation—the Council having power to call extra meetings whenever they think advisable to do so.

As the Society is aware, the Annual Exhibition was opened in Mr. Hay's Fine Art Saloon, George Street, in December last, and continued open about three months. Like all similar exhibitions, it suffered from the prevailing public depression caused by the lamented death of the Prince Consort, and has resulted in a loss to the Society of about £40.

The exhibition itself, it is scarcely necessary to remind members, was one of the best which has been held under the auspices of the Society. On this occasion three silver medals were offered as prizes. For the best portrait or group, the prize was awarded to Mr. D. O. Hill, R.S.A., for his artistic picture of *Dr. John Brown and his Cousin Dr. John Taylor Brown;* for the best frame of six *cartes de visite*, Mr. H. P. Robinson, of Leamington, was the successful competitor; and for the best photograph of any other kind the medal was awarded to Mr. Mudd, for his beautiful picture of *The Tay above Dunkeld.*

The Council have alluded to one cause of the unsatisfactory result of the Society's last Exhibition, in a pecuniary point of view. They have also for a considerable time been aware that the present place of exhibition is not well situated for the purpose, and that this operated largely against the success of their Exhibitions. While, therefore, it is very far from their wish to recommend that the Society should discontinue holding their Exhibitions, notwithstanding the loss which has been sustained this year, they would suggest that it should be left to the Council to fix whether or not there should be an Exhibition next year, according as they may succeed in finding rooms better adapted for the purpose, or may otherways have reason to expect that the Exhibition will not be attended with loss to the Society. In the event of an Exhibition being held, the Council would recommend that the Society's silver medal be again offered for the best *portrait* or *group* and the best *landscape;* and, in addition, that a medal be given for the best *instantaneous picture*, embracing figures in motion, and of a size not less than seven inches by nine inches.

As recommended at last general meeting, the Council selected from the Exhibition, and distributed among the members, a number of valuable photographs. Any member who may not, from residing in the country or otherways, have received his copy, will do so on application to the Honorary Secretary.

As required by the laws of the Society, the President, the Senior Vice-President (Mr. Sheriff Moir), the four senior members of the Council (Messrs. Scott Elliott, Walker, Kinnear, and Moffat), the Honorary Secretary, and the Hon Treasurer, retire upon this occasion, but are re-eligible.

The Council would suggest that the President, Secretary, and Treasurer, be re-elected to their respective offices; that Mr. Kinnear, who filled the office of Secretary so satisfactorily, be elected a Vice-President; and that the vacancies in the Council be filled up by the re-election of Mr. Elliott, and the election of the Rev. T. D. K. Drummond, Mr. Moir, and Mr. Tunny.

The Treasurer's accounts are herewith submitted to the Society, and a state of the funds is annexed, showing the sum at the Society's credit to be £356 9s. 7d. as compared with £386 18s. 11d. at the close of the preceding year.

STATE OF FUNDS AT 1ST MAY, 1862.

Balance due by Royal Bank					£375	10 1
Arrears of Subscriptions considered recoverable					5	5 0
					£380	15 1
Balance due for Photographs purchased	£22	6	6			
Balance due to Treasurer	1	19	0			
					24	5 6
Amount of Funds					£356	9 7

After some discussion as to the propriety of reducing the stated meetings of the Society, it was agreed to limit the meetings of the Society to three, as suggested in the report, but to leave it in the hands of the Council to call extra meetings, should they think fit.

On the motion of Major Bell, seconded by Professor Macdonald, the Report was unanimously adopted.

The following is a list of the office-bearers elected for 1862–3:—

President.—Sir David Brewster, K.H., F.R.S., &c.

Vice-Presidents.—Messrs. Horatio Ross and C. G. H. Kinnear.

Council.—Messrs. Alex. Young Herries, T. B. Johnston, J. Ramsay L'Amy, Findlay Anderson, William Scott Elliott, Rev. D. T. K. Drummend, Messrs. George Moir, and James Tunny.

Honorary Treasurer.—Mr. H. G. Watson.

Honorary Secretary.—Mr. A. F. Adam.

Honorary Auditor.—Mr. John Cay.

On the conclusion of the ordinary business an exchange of photographs among the members took place.

EDINBURGH PHOTOGRAPHIC SOCIETY.

This Society met on the evening of the 21st ult. The chair was occupied by Mr. Bow, C.E., and, subsequently, by Mr. Slight (the two Vice-Presidents).

The following were admitted members:—Messrs. James H. Hamilton, Daniel M'Kay, Alexander M'Glashon, and James Anderson.

The subject for discussion was the tannin process. It was introduced by Mr. Taylor in a few general remarks; followed by

Mr. Nicol, who explained the various contrivances for preventing the film slipping off the glass plates. The gelatine solution usually employed for that purpose was, he asserted, objectionable when it got on the back of the plate, as it would deteriorate the silver bath. The best solution for effecting the purpose he found to be India-rubber dissolved in benzole not stronger than two grains to the ounce. When it was stronger there was a danger of the film cracking. He had also tried Mr. England's modified tannin preservative solution, which contained an equal proportion of honey and tannin, and he found the results to be a very greatly increased sensitiveness. Unlike what might have been expected, from the well-known deliquescent properties of honey, the preserved film was beautifully hard, and possessed a surface of such a polish as to make it a matter of doubt, at first sight, on which side the film really was. He found the exposure to be the same as for wet collodion developed with pyrogallic acid.

Mr. Taylor suggested that, seeing it was out of the question to employ iron as a developer on a tannin plate, a considerable improvement might be effected by developing with a solution of gallic acid to which a solution of sugar of lead had been added.

Mr. Burns said that he had that morning exposed some plates prepared in various ways. He used a landscape lens eight inches focus, with a quarter inch stop. The time of exposure between five and six o'clock in the morning, with a Fothergill plate, was three minutes,—the resulting picture being a little over-exposed. One of Mr. England's tannin plates at the same time was exposed twenty seconds, and was overdone. To another he gave ten seconds, and he found it rather under-exposed.

Mr. Lennie stated that he had tried the development of tannin plates with iron; but the pictures were very flat and quite without force.

Major Bell exhibited a number of stereoscopic prints by this process. They were much admired.

After some general conversation on the subject,

Mr. J. T. Taylor said that within the last few days he had, in a letter to the President, who was at present in London on public business, resigned his office as Secretary. Ever since the formation of the Society, by himself and three other gentlemen, he had held that office, the duties of which he had discharged to the best of his ability; and during that period he had received valuable assistance in furthering the efficiency of the Society from many of the members, to whom he tendered his thanks. His own business, however, would prevent him in future from paying that attention to the interests of the Society which would be required by the office of Secretary; and a circumstance had occurred since they last met which would certainly not diminish the duties of those who held office in

* Given in Sir D. Brewster's *Treatise on the Stereoscope*, pp. 56, 57.

† The introduction of the word *equal* will cause our result to be too small; but we thus err on the safe side.

the Society: he alluded to the virtual demise of the Photographic Society of Scotland, which seemed to have abandoned the field to them by a resolution passed at their annual meeting the previous week, limiting the number of meetings of that once famous Society to three in the year in future. The Edinburgh Society now numbered above one hundred members, and, as they were aware, met twice a month. To preserve the Society in that state of prosperity it would be necessary to have some one in his place who could devote more time to the Society's interest than he, who had an increasing business of his own to attend to, could be expected to do.

Mr. Nicol said he must urge Mr. Taylor to reconsider his decision. They were not in a position to dispense with his services at present.

The Chairman stated that the subject would be brought before the Council at their first meeting, and they would try and induce Mr. Taylor to continue in office at least till the next annual meeting.

Mr. Taylor, in reply, said he had considered the subject pretty thoroughly, and the result was that he thought it best for the Society's interest to retire at present when they were entering on a slack time, as his successor would be thoroughly seasoned by the time the hot work of the winter meetings set in.

After some further conversation the subject dropped. A Committee was appointed to organise an excursion to the country; after which the meeting separated.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

The usual monthly meeting of this Society was held on Monday, the 5th ult.,—M. Gabriel, President, in the chair.

After the reading and confirmation of the minutes of the last meeting, and the nomination and election of new members, the President opened the correspondence of the month.

He read letters from M. Delterre, editor of the *Bulletin Belge de Photographie*, and M. Mechet, of Paris. The latter announced the despatch of two micrographic apparatus, which he desired to submit to the examination of the members of the Society. They were described as being automatic, and intended for the production of negatives suitable for enlargement. As they had not, however, arrived, they could not be reported upon until the succeeding meeting.

The President read a passage from a letter in which M. Vidal, the Secretary of the Society, described the cordial reception which he had met with in the photographic world of Paris, and announced some very interesting communications for the next meeting of the Society. The President availed himself of that opportunity of expressing his regret at the absence of M. Vidal, and of thanking him at the same time for the zeal he had displayed in the service of the Society while in Paris, notwithstanding that his departure for the capital had been caused by other business.

The rules and regulations of the English and Foreign Photographic Exhibition at the Crystal Palace in London were also read to the Society.

M. Rey, photographer, laid on the table a part of the translation which he had undertaken of Major Russell's little work on the tannin process. As soon as it was completed it was intended to place it among the archives of the Society.

The President directed the attention of the members to a copy of a new work by M. Disderi, entitled *L'Art Photographique*. It was intended shortly to publish this work, and the copy now presented by the author to the Society was referred for examination to the special Committee for publications.

The Society thanked M. Disderi.

M. Teisseire presented several very successful positive proofs which he had obtained from dry collodion negatives (Taupenôt process). He showed, besides, some proofs of the same subject, some of which were obtained by the wet process and others by the dry, and directed attention to the superior intensity and delicacy of detail in those obtained by the dry method. He concluded, from the evidence afforded by the pictures exhibited, that this latter process should be always used in the reproduction of woven fabrics or engravings, which would offer less marked contrasts—like old pictures, for instance. The communication greatly interested the Society.

M. Teisseire then proceeded to the analytical examination of the monthly publications, and laid on the table the brief *resumé* of his labours.

The duty of analysing the French publications for the following meeting devolved upon M. Jacquemet.

The President then announced that the French Photographic Society had decreed to M. Poitevin the prize of 2000 francs, founded by M. Le Duc de Luynes.

The members of the Society received this announcement with great satisfaction, and expressed a desire that, by way of testifying their sympathy for M. Poitevin, a letter of congratulation should be addressed by the members of the Committee to that *savant*. The motion was unanimously adopted.

MM. Teisseire and Hudelot described their views on the subject of an instantaneous shutter.

M. Jacquemet mentioned that M. Roux, whose successful working of the Taupenôt process they were acquainted with, now obtained by the tannin process (which he at first regarded as incapable of yielding good results) negatives equally satisfactory. He followed the method formerly indicated by M. Vidal, with the modification that he always plunged the plate after exposure into a bath, containing two per cent. of nitrate of silver, before submitting it to the developing action of the pyrogallic acid. M. de Roux would in future work none other than the tannin process: he had sufficiently tested it to be able to guarantee its constancy. While regretting that the absence of that able experimentalist deprived the Society of the detailed communication of his labours, M. Jacquemet submitted a very satisfactory negative which he had obtained from an oil painting, by a dry collodion tannin plate, adopting exactly the method followed by his colleague.

M. Teissiere showed some positive proofs of a very agreeable tone which he had printed on albumenised paper sensitised in a bath of ammonio-nitrate of silver of five per cent. strength, submitted by M. Ferriss for examination by the Society.

M. Jacquemet exhibited a dark box, invented and patented by M. Cristin, a photographer of Marseilles. The apparatus, which appeared at first sight very ingenious, is intended for a variety of photographic operations, such as sensitising, developing, &c.; and M. Jacquemet undertook the examination of it, promising a report thereon at the next meeting of the Society.

The President then announced, with the highest satisfaction, the recent decision of the Imperial Court of the Chamber of Appeals of Correctional Police at Paris, which, in the matter of Mayer and Pierson, by reversing the original decision, tended to place photography among the creative arts, and admit it to the same legal privileges as painting. The decision was read to the meeting.

The President thought it almost unnecessary to enlarge on the importance of the decision, in furtherance of which the Society had raised its voice. And without desiring to under-rate the value of the judicial movement, he was nevertheless of opinion that photography would receive, by means of a new law relating to property in literature and art, a still more substantial recognition than it had yet received; and he reminded the Society of the efforts which it had recently made with that object in view in its letter to the Minister of State.

Before the close of the meeting the members proceeded to the nomination of the members of the Committee appointed to collate and arrange statistics of the photographic art in France. Their labours would commence from the date of the next meeting.

The meeting was then adjourned.

MICROSCOPICAL SOCIETY.

An ordinary general meeting of this Society was held at King's College, London, on Wednesday, the 14th ult.,—R. J. Farrants, Esq., President, in the chair.

Mr. Charles Brooke, in alluding to the various presents to the Society, said, in reference to a bust of the late Mr. Andrew Ross, presented by his son, Mr. Thomas Ross, considering the vast improvements which Mr. Ross had effected in the construction of the microscope, and that to him mainly the Society was indebted for the great perfection of the deep objectives, the Society should not receive the bust of so eminent a man in the manner of an ordinary present. The Society should tender especial thanks to Mr. Thomas Ross for so interesting a memorial.

Dr. Lankester, in seconding Mr. Brooke's motion, said that the Society was not only indebted to the late Mr. Ross for the work of his hands, but also for the work of his brain—inasmuch as a more skilful and masterly article was never written than that upon the microscope in the *Penny Cyclopœdia*—and on that ground, also, he was entitled to their gratitude. Every member must be glad to see some memorial of so eminent a man, and especially such a life-like bust.

The Rev. J. B. Reade thought the Society was also indebted to the late Mr. Ross for leaving a son so well qualified to follow in his father's footsteps.

A vote of thanks to Mr. Thomas Ross was carried by acclamation.

Dr. Leared read a paper *On a Flukeworm in the Heart of a Turtle.*

The Chairman said that in the specimen in his hand he could perceive the ventral sucker. He took exception to the proposed name, viz., *Monostoma*, and believed that it should be *Distoma;* but that was a question which Dr. Leared must settle as he would. The specimen he (the Chairman) had in his hand was not the only specimen in which the second sucker could be seen. Although he might be mistaken if he depended upon one specimen only, he could not when he found the same occurrence in many.

Dr. Leared felt great deference for the President, and observed that he had examined very carefully the specimen and submitted it to Dr. Cobbold, and both thought the appearance arose from the *parenchyma* being pushed out, which, therefore, produced the appearance of a second sucker.

The Chairman said that, in the specimen in his hand, the worm was in profile, and the funnel-shaped form of the sucker was well shown, and that he had more than one specimen of the same kind: he (the Chairman) therefore thought that it was not a mere pushing out of the *parenchyma.*

Mr. James Smith read a paper *On Microscopic Stereography, and the making of Stereographic Slides of Microscopic Objects.*

Mr. George Shadbolt read a communication from Dr. Maddox, of Southampton, descriptive of *Acari* found living in the nitrate of silver bath of the photographer. [See page 189.] The paper was illustrated with many very excellent photographs taken by Dr. Maddox.

Mr. Wenham asked whether Mr. Shadbolt had had an opportunity of comparing Dr. Maddox's insects with those which Mr. Cross found some years ago in an acid preparation?

Mr. SHADBOLT said he had not, and believed that it was precisely the object of Dr. Maddox in bringing the subject forward to obtain information from those who had seen the *Acarus Crossi*.

Mr. WENHAM said that Mr. Cross found the *Acarus electricus or Crossi*—as the insect was called—in great quantities, having a pearly appearance, in solutions of nitrate of copper, and he thought it was a question whether the insects were actually in contact with the corrosive solution or were encased in coatings of air.

Dr. LANKESTER said that Dr. Maddox's paper was a very interesting one, having regard both to the nature of the insect and the place in which it was found, and thought the Society must refer to their entomological friends for the history of the creature. There was a great analogy between the creatures found by Dr. Maddox and Mr. Cross's. The Society was very properly referred to the supposition that the animals had been developed from *ova*, under some circumstances. Mr. Cross had also shown that *Acari* would live under circumstances which to higher animals would be fatal; others were known to feed upon poisons, such as strychnine, and capable of eliminating from it hydrogen, oxygen, and nitrogen, and of converting, even, into fatty matter poisonous and acid solutions. He (Dr. Lankester) recollected being, many years ago, very much astonished at finding a large number of organisms in the sulphuretted hydrogen waters of Harrogate, and among them many forms of *Confervæ*, which he described at the time, and which were then interesting in consequence of the place in which they were found. He was reminded of a paper, by Dr. Pereira, in the *Pharmaceutical Journal*, on *Fungi*, found in solutions of mineral substances. Dr. Maddox's paper opened up an inquiry into the forms of animal life which were not destroyed by that which destroyed the higher forms of life.

Mr. WENHAM said there was one great distinction between the animals of Dr. Maddox and the *Acarus Crossi;* for those of Dr. Maddox were found on the surface of the solution of nitrate of silver, while the *Crossi* were found deeply immersed in the solution of nitrate of copper.

The Rev. J. B. READE thought that the word "on" used by Dr. Maddox in his communication gave a different notion of the nature of the creature and its *habitat* to that of the *Crossi*. The photographs exhibiting its structure, its mandibles, and other portions of its body, proved that it had something different to feed upon than the solution of nitrate of silver. It was questionable whether Dr. Maddox had stated distinctly that they were found in the solution as water spiders were found.

Mr. SHADBOLT said that the paper clearly said "on" the surface.

The Rev. J. B. READE said then that he thought Dr. Lankester had imagined that the creatures were actually existing immersed in the solution, and could float about as water spiders and other creatures did. If the members adhered to the author's word "on" they would not necessarily come to the conclusion that the creatures fed upon the fluid.

Mr. SLACK mentioned that in the experiments of Mr. Cross the creatures did not survive unless they got out of the liquid.

Mr. WENHAM said he recollected that Mr. Cross mentioned that when the creatures were detached from the positive pole of the battery they perished, and that seemed to have confirmed the notion that they must have been enveloped in a *film of air*.

Dr. LANKESTER did not think that *Acari* could be developed only upon strychnia, any more than other creatures could continue to exist in nitrate of silver; and the question therefore arose what was the nature of the material on which the creatures fed? There must have been other agents than nitrate of silver contributing to the creatures' nutrition.

Mr. SHADBOLT, in reply, stated that the conditions under which the creatures were found were very distinctly expressed in the paper:—"When the solution was returned to the bath, half-a-sheet of white foolscap paper was first folded down on the top, and then the cover placed over it." The only possible materials upon which they could have fed must have been either the nitrate of silver or the portion of the paper which was over the surface. Dr. Maddox found that on treating them with iodide of potassium they produced the well-known yellow precipitate of iodide of silver. In reference to the paper which had been read by Mr. Smith, he (Mr. Shadbolt) said that he had received from Dr. Maddox two stereoscopic photographs of a minute specimen of the *Radiata*, which were very effective in the stereoscope. The mode he adopted was suggested by Professor Rood, of Troy University, in the United States, and was a stage turning on an axis to the right and left; but the plan suggested by Mr. Smith appeared to be more simple. There was no reason why Mr. Smith should not have photographs with detail quite sufficient for every purpose of stereography.

Mr. Webb presented the Society with a slide engraved by an instrument made by himself, in principle the same as that of Mr. Peter's, which is just now exciting so much curiosity in the International Exhibition. The slide contained the 4,137 letters of the fifty-one verses of the first chapter of St. John in the $\frac{1}{500}$th of an inch, and excited general admiration.

In reference to Mr. Webb's productions, we have before us two slides, the one with the Lord's Prayer and the other with a verse of "God Save the Queen," very beautifully engraved; and, for the information of many who have expressed a desire to obtain specimens of minute writing, we may mention that we have been informed that similar slides may now be procured from the London opticians.

The meeting then resolved itself into the usual *conversazione*.

Notes of the Month.

THE full tide of a busy London season has now fairly set in, to which is superadded the attractions of the International display, and most photographic studios are working at "high pressure." The jurors appointed for the various departments of the Exhibition are painstakingly investigating the claims of exhibitors to pre-eminence. Those of the photographic department might have been seen at an early hour one morning last week prosecuting their labours amidst dust and paint, for the place is still unfinished. One unlucky wight let an enormous paint-brush full of wet paint fall from his scaffolding upon the irreproachable hat of Lord Lennox, crushing it to ruins. His lordship apparently did *not* enjoy the joke.

The absence of the Presidents of the two Water Colour Societies was remarked on the opening day at South Kensington. These gentlemen had offered on the part of the bodies they represent to superintend the hanging of their own pictures, fondly believing they were more competent for the task than any one else. However, they were snubbed by the officials, and when invited to swell the pageant of the 1st of May, very properly declined the honour.

Messrs. Day and Son, the well-known lithographers, are publishing a work entitled *Masterpieces of Industrial Art and Sculpture at the International Exhibition of* 1862. It will consist of 300 plates of the most choice examples, foreign as well as native, in sculpture and decorative art, executed in the highest style of excellence attainable in chromo-lithography. The whole of them will be from photographs taken expressly for the purpose, which will then be destroyed. The edition is limited to 2000 copies. The price of the work will be fifteen guineas, thus representing a sum of upwards of £30,000. This important work—more complete than any of the kind yet published—will be the most magnificent, useful, and interesting *souvenir* of the Exhibition, rendering with exact fidelity, both in form and colour, the *chef d'œuvres* of the world's progress in art and industry.

Many additions are yet being made to the foreign photographs at the "World's Fair." We commend to the lovers of the beautiful some studies of heads just hung in the Indian department. Some coloured photographs in the Hungarian Court will prove amazing and amusing.

An useful chapter might be made of the curious applications of photography to be found throughout the Exhibition building. One of the most elegant is its application to the adornment of porcelain and other vases, &c. By some process they are made to show through transparent media, but are not get-at-able, being bound up in the manufactured article.

The light in the Exhibition building, except under the domes and a few other places, is not found to be favourable for photographic purposes. The exposure required is so long that single view lenses, except in the best lighted spots, are useless—many, very many, of the objects requiring an exposure of ten minutes, even with double combination lenses of large diameter.

From letters dated "Damascus," we learn that Mr. Francis Bedford was in excellent health and spirits, as also were the whole party; and doubtless in the course of another fortnight Mr Bedford will be (D.V.) again amongst us. He had, up to the latest date, acquired 130 twelve by ten good plates. The lovers of superlatively good photography have unquestionably a great treat in store.

Some photographs from Japan, now on view at Mr. Hogarth's, in the Haymarket, are very interesting and curious, as displaying the physical character, costumes, and manners of that people, and as attesting the extreme fidelity of Japanese art. These photographs render what we find in their pictures with a resemblance which is startling. The Japanese Court at the International Exhibition is full of things displaying the soundest principles of ornamental art. A learned *savant* in such matters, whose judgment every one must respect, is loud in his praises of the exquisite workmanship displayed, even to the fashioning of a button or the simplest ornament. Let no one be deterred by the somewhat sombre exterior of this department from giving it a close inspection.

An interesting application of photographic art has been made by Messrs. Powell and Co., in the ornamentation of glass vases which are now in the International Exhibition. These vases consist of an external envelope of fine flint glass, and an external coloured glass representing marble, &c.: between these two portions lightly-printed photographic impressions of statues, &c., have been included, producing the effect of sculpture upon marble. S. T.

Scraps and Fragments.

ENGLISH LENSES.—We are pleased to find that the photographic lenses produced by our English manufacturers are becoming duly appreciated on the Continent for their superior excellence. Amongst other evidence of this fact, we cannot forbear citing a paragraph from a note we recently received from M. Monckhoven, who says:—"I ordered some objectives of Mr. Dallmeyer, and have lately received them. *They are the best that I have ever seen.*" The underlining is in the original.

In Memoriam.—We regret to have to record the decease, on the 30th April last, of Mr. J. W. G. Gutch, a gentleman who was once a candidate for the editorship of this Journal, and who has contributed occasional articles to the pages of a contemporary descriptive of his photographic tours. Mr. Gutch was born in Bristol, and was a surgeon by profession, having been educated at the Infirmary in that city; but after being for some time in private practice in Florence, he accepted the pleasant and varied but somewhat laborious life of a Queen's Messenger, and as such bore the despatches of our Ambassadors from most of the capitals of Europe where we are represented by plenipotentaries—including Paris, Madrid, Vienna, St. Petersburgh, and Constantinople. It was, we believe, while engaged in the last named mission that he was struck with a paralysis, and had to retire from the service on a pension. Still, of a refined taste, and genial disposition, he bore his sufferings (which were at times most acute) with the greatest patience, and occupied himself in literary and art matters, having been, amongst other things, a very ardent photographer. Under the patronage of the late Prince Consort (to whom, by his own wish, the work was dedicated), Mr. Gutch published for twenty-one years an almanac, entitled *The Literary and Scientific Register*, which was a little encyclopædia in its way, and showed how varied and useful was the knowledge its compiler possessed.

Mr. HEATH'S EXHIBITION.—The Royal Commissioners of the International Exhibition having done so much for the elevation of photography by putting it into the "garret," Mr. Vernon Heath—no doubt impressed with the conviction that his productions stand but little chance of being seen there—has opened a private Exhibition of his own works, at his own studio in Piccadilly. The collection comprises about forty landscapes of varying but, in all cases, considerable merit; together with some portraits, including the last one taken of his late R.H. the Prince Consort. A small printed slip by way of catalogue is provided for the convenience of visitors. Many of the subjects we have before noticed; but there are some new to us. No. 8, *On the Banks of the Almond, Perthshire*—and No. 13, *On the Turrit, Perthshire*, we casually mentioned as being in the International collection. Both of these are fine specimens of landscape photography. The former, contrasted with No. 23, is an excellent illustration of the requirement of brain work of no mean order in a photographer; the two subjects being almost identical—the point of view being but slightly altered—the result in one case is admirable, and in the other commonplace. It is but right to add that No. 23 was taken to please a friend, and No. 8 to please the operator, as we are informed. No. 10, *Burn, St. Fillan's*, is, though not a picture, a fine study of rock, water, and heath. No. 22 is a very pleasing subject, being a highly picturesque *Peasant's Cottage at Monzie, Perthshire*, and admirably suited to photographic delineation. We were surprised when informed that a diametrically opposite opinion has been expressed by an Edinburgh critic of the Exhibition there; but we learn that, as if to revenge the disestimation, more copies of that picture were sold than of any other in that collection. Our readers will do well to look in at Mr. Heath's.

THE PROGRESS OF PHOTOGRAPHY IN PHILADELPHIA.—We cull the following extract from a local newspaper—*The Press*—received from our worthy American correspondent, Mr. Coleman Sellers:—"Heaven, always beneficent, and, in the best sense, democratic—dispensing its bounty alike upon the high and the low—has, in the development of this art (photography) turned painter for the poor man's home. Thus, while for ages the princes and nobility of earth could boast of their 'works of the old masters,' we, through modern photography, have great objects minified, and small ones magnified, by the golden pencil of an older and a greater Master, with a rapidity that makes their possession a source of pleasure and improvement in every household. It is gratifying to us that, in this race for superiority in the various branches of the Daguerrian art, Philadelphia, if she has not achieved a decided pre-eminence, has at least kept equal pace with any of the cities of Europe or America. The sale of photographs, especially the *carte de visite* size, has become an important item of trade. By this means, in conjunction with the photographic album—which is another invention for all future time—the most celebrated personages in every part of the world are made familiar to all whose tastes run in that direction. We were not aware until yesterday that the sale of *cartes de visite* in London and Paris was largely of American celebrities, the pictures being executed here to the order of the transatlantic dealers. For some months past Mr. Gutekunst, of this city, who is confessedly unsurpassed in general photography in this country, and in the production of the popular *carte de visite* unrivalled, has fulfilled a large number of foreign orders of this class. A brief outline of the formula or system observed in waiting upon applicants for sittings may not be uninteresting. On entering the reception room, the sitter is furnished with a ticket containing the number of his 'turn,' and specifying the kind of picture desired. If a lady, the next step is to proceed, by an easy stairway, to the ladies' dressing room, on the second story—a handsome apartment, furnished with all requisite conveniences, and supplied with entertaining books to pass the time pleasantly while waiting. A similar apartment is also appropriated for gentlemen unaccompanied by ladies. On the arrival of the 'turn' designated by the number, notice is given by the operators, and the subject for a photographic operation is directed to some one of the *three* 'sky lights,' or operating rooms. Here the 'negative' is obtained, or glass plate with the portrait impressed upon it in reverse. We may also state here that every negative is marked with the *number of the ticket given to the sitter*, which number is also set opposite to the person's name, upon a register kept for this purpose, so that if duplicates are called for any time within a year (that being the limited time for preserving the negatives), they can be produced without delay. The room where these negatives are stored affords a startling idea of the extent to which photographing is carried on in this establishment, the present number of negatives, accumulated within the past year, exceeding *thirty thousand*."

Foreign Correspondence.

Paris, May 28th, 1862.

UNDER the title *Traité de l'Impression Photographique sans sels d'argent* M. Poitevin has just published a *brochure* recapitulating those labours which have earned him his well-merited reputation. The object aimed at in those labours was the obtaining of permanent pictures. M. Poitevin has solved that difficult problem, and has thereby acquired a glorious title which will remain attached to his name. While on this subject it may, perhaps, be not unuseful to offer your readers a brief sketch of the history of carbon printing. I will speak only of what has been done in France, as the labours of your own investigators must be better known to you than to me.

The first process of the kind published was by M. Poitevin, and was patented in 1855. It is still employed by M. Lemercier for photo-lithography, and by M. Fargier for the printing of positives. It consisted in the application to paper or other substance of a mixture of alkaline bichromate, and an organic body (especially bichromate of potash and gelatine), together with colouring matter.

At the same period M. Testud de Beauregard, an amateur, made known the results of a process which he published in 1857, but which gave but insufficient pictures. This process reposed, as did that of M. Poitevin, on the use of bichromate of potash with an organic body and carbon.

In 1858 Messrs. Garnier and Salmon patented a process which, after being modified by them, came to the use of the same substances—alkaline bichromate, an organic body, and a colouring matter. These gentlemen had made mention of a process which they afterwards abandoned, and into which citrate of iron entered.

So far it was always the same principle, the only real difference being in the details of manipulation; but in following up his researches, M. Poitevin, "the common father of all these processes"—to use the expression of the Commission of the Luynes Prize—had discovered a new reaction, which, while simplifying the operations, produced results far more perfect. In 1860, therefore, he published his process of printing with perchloride of iron and tartaric acid. Finally, at the same period, M. Fargier again took up the bichromate of potash and gelatine method, modifying, however, the transfer of the image by a manipulation previously suggested for another purpose by the Abbé Laborde.

Such is in substance the history of carbon processes in France. Two only have remained in practice, namely, the bichromate process and the perchloride of iron and tartaric acid process, already

improved by experience. Thus the honours of the fight belong to the author of the *brochure* we spoke of in beginning.

The little book contains other curious information on the transformation of Daguerrean pictures into photographic *clichés;* chemical engraving, sunk and raised; photography on glass coated with gelatine; various collodion processes; and, lastly, the system of gallate of iron printing—numerous specimens accompanying the letterpress, and give a further interest to the publication.

A photographic portraitist, M. de Lucy, has just introduced a somewhat ingenious modification into the card portrait. The public would prefer to see these cheap and favourite portraits coloured if the prices were not thereby greatly augmented. M. de Lucy has made a toning bath so composed that when the positives, previously prepared, are plunged into it the parts corresponding to the face and hands take a reddish-brown tinge, which is a very good imitation of the flesh tone. This chemical colouration has the advantage of preserving the modelage intact; and, as it requires no after work, the author can sell his tinted pictures at the same price as the others. The idea is well received.

From several German photographers, whose names are little known, I have just received some card portraits which are remarkable for their printing. It must be acknowledged that French portraitists are not sufficiently attentive to this branch of their operations; and if some produce *clichés* of really artistic worth, nearly all neglect the positives to such a degree that the pictures by foreign photographers leave far behind them in this respect the best productions of our foremost artists. Let us hope that the speedy adoption of carbon-printing will change this state of things, which is calculated to give unfavourable notions of the skill of our operators.

The meeting of the French Society of Photography, which was fixed for the 16th of this month, is postponed. As you have received a report of the last meeting of the Marseilles Society, which also had been deferred in consequence of M. Léon Vidal's absence, I will content myself with calling attention to the persevering and successful essays communicated by those who are studying the dry processes. This is a new and happy direction given to the labours of our photographers, who, until now, have been too much attached to the wet processes. ERNEST LACAN.

Philadelphia, May 11th, 1862.

My last letter to you was written in New York: since then I have visited many cities in New England, and now once more address you from Philadelphia. Outside of New York I found but little of interest in the way of photography. The country towns are always behindhand in adopting the latest improvements and discoveries in the art; and I am inclined to believe the country operators do not invest much money in photographic literature, at least not in the journals of the day. They generally depend on picking up information from the itinerant vendors of wonderful formulæ, and from the handbooks published from time to time. Divine's new book—which gives some very good instruction—sells rapidly; in fact, the publisher tells me the edition has been exhausted.

Now that I am away from the noise and bustle of New York, and can look back at what I there saw, sifting the good from the bad, and treasuring up the choice items of information for future use, I feel that the art as conducted in the large establishments of that city must be considered as the highest grade of photographic portraiture in this country. There are hundreds of establishments there where work of the poorest character is turned out, but the good class of work is falling into the hands of those best able to do it; hence such large establishments as Brady's, Fredericks', &c., are pressed almost beyond their ability, and that too almost exclusively with card pictures. Messrs. Anthony are printing 3600 of these pictures every day, and yet they are behindhand in supplying some orders.

I visited their factory in company with Mr. Henry Anthony, and was struck with the great care taken to produce good work. As we entered the printing-room the prints of the day before were being assorted—those not perfect enough for sale being torn up and thrown up into a scrap pile; and that scrap pile, had the pictures not been torn, would have been a good place to spend an hour or two in. Most of the printing is done by women, one man having charge of the toning.

Mr. Anthony has introduced many novelties into his way of working, and has very wisely kept to himself his most valuable formulæ. Yet he is a kind friend to amateur photographers—ever ready to lend them a helping hand; and I have to thank him for much valuable information. His washing arrangements for his prints is on quite an extensive scale, the most noticeable feature being the management of the jets and currents of water in the different tanks. His theory being that as paper floats before it has been in the hypo., the preliminary washing is all done in tanks, having the water distributed by jets on top, while the final washing to carry off the hypo. is conducted in a tank so arranged as to have the water ascend from below, thus lifting the water-logged prints and keeping them in motion. I should not neglect to say that the syphon principle of intermittent emptying of the tanks is in general use.

I find that acetate of soda is much used in toning, the toning solutions consisting of acetate soda, common salt, chloride of gold, and sometimes, for over-printed proofs, chloride of lime. But little attention is paid to exact quantities; but, as one operator expresses it, he "takes a small handful of each salt, and adds them to about five quarts of water, and then pours in fifteen grains of gold." Mr. Anthony tells me that the use of salt in the toning solution is a preventive to irregular toning, and avoids the red stripes arising from streaks of thick albumen on the paper.

In a former letter I mentioned glass roofs, and gave, as the experience of a first-class operator, an objection to blue glass; but while in New York I saw many instances of portraits taken under such light, which could not have been obtained in any other way. One very old gentlemen, whose eyes were painfully affected by strong light, showed me his portrait taken by Fredericks, and assured me that it was the first good one he had been able to get. It was remarkably well executed, the eyes well expanded, and no painful contraction of the brows.

Dry collodion is engrossing as much of the attention of amateurs as ever, and we are still on the eve of that wonderful instantaneous dry process; but I am free to confess as yet it has not been reached, to my knowledge, this side of the Atlantic. Dr. Draper's warm water has been only an approximation to the desired end, and it does not seem to answer for many of the other dry plates besides tannin.

A great want is felt of a very perfect arrangement for changing dry plates in the field, and considerable originality is being displayed in the outfits of the various amateurs. Wood has been preferred as the material for constructing these cameras and boxes, although there are many made of brass. In fact, the first cameras made in the United States were of that metal.

While at Springfield, Massachussets, my business was with the U. S. Armoury. This celebrated manufactory of rifles has been carried on with closed doors since our war began, as visitors interrupt the workmen and distract their attention. But being provided with a pass from Major Dyer, the commandant, and having four days to devote to this one establishment, there was time to enjoy some of the charming views over the Connecticut Valley from Armoury Hill; and in one of my rambles over the ground I found a dark tent, deserted and out of order, but to the eye of a photographer looking like work. At first I hoped there might be some kindred spirit among the officers of the works—some amateur; but none could be found. In the Major's parlour his wife showed me some good views, but could not say by whom they were taken; in fact no one seemed to take any interest in the artist, whoever he might be. At last, just before I left there, I happened to ask the Major's coachman, as he was taking me to the hotel, to whom that mysterious dark tent belonged? He soon informed me that some photographic firm in the town were the owners, and that before they had taken to the art they had been employed in the Armoury. To them I went, and found quite a room-full of pictures; for their "art-gallery was open every day and evening." But of all the uncommunicative individuals I ever encountered they were the most so. I could make nothing out of them; and when they bowed me out I dare say they congratulated themselves on getting rid of a very inquisitive visitor.

One half-day we spent in the Cemetery of Springfield, and secured thirteen good stereoscopic negatives, proofs from which shall be sent to the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, when they can be printed. Speaking of that gentleman reminds me that several persons in New York called my attention to a remark of his before one of the societies, to the effect that "it was quite likely that what the Americans called instantaneity might not accord with the English views on the subject." I explained to them that Mr. Shadbolt alluded to dry plates and not to wet, and that the claim for quickness in Dr. Draper's process gave grounds for supposing just what he had asserted; for I have not yet seen any proof at all of a perfectly instantaneous dry plate having been produced here or in England, assuming as a criterion the best wet instantaneous pictures made by Messrs. Anthony.

These gentlemen use a drop shutter falling very freely, and in some cases have used a spring; but their experience is in favour

of the wooden drop. Their collodion, as I have tested myself, has qualities peculiarly fitted for quick work; and this quickness is not only due to the purity of the chemicals used, but to the addition of other chemicals to their collodion not generally used. Most sincerely do I hope that they will relieve me from my promise of secrecy on this score, and then I shall tell you how they work. The instrument they use has an opening of about three-quarters of an inch diameter, and gives a clear field, in which can be inscribed a square of three and one-half inches, all the objects being in focus to the extreme corner.

I have now before me a large number of interesting communications relating to scientific photography; but I must keep them for another letter.

Mr. T. E. Blackwell, of Canada, has just passed through Philadelphia on his final tour through the States, collecting his reminiscences of America. He brought from Canada the negatives of the eclipse of last year as observed by Mr. Notman for him; but unfortunately two of the negatives were broken on the journey, and the series is thus injured.

One of the gentlemen to whom I am indebted for valuable information intended for these pages, writes to me saying that he wants "Strasburgh Cathedral (on paper), and if I could get the inside of the Arch of Titus, *the side with the golden candlestick* (I have the other side), I should be happy." If any kind friend will send me these for him I will repay him fourfold in kind, and will promise him the thanks of one of our first men of science.

I mentioned in a former letter Dr. Dean's work. He is preparing a work on the nervous system, and its illustrations will be from the photo-micrographic copies of the sections of the various nerves. Thus I have before me now sections of the *Medulla oblongata* from human subjects, as well as various animals of low grades. Some are said to have been on tannin plates, and some very fine prints have the memorandum "ammonio-nitrate print" on them. He has shown great skill in the production of his proofs, which are remarkably clear and full of delicate detail. His expertness in preparing the sections for the microscope has been mentioned by many who are able to judge of such matters. I must here state that my correspondence with THE BRITISH JOURNAL OF PHOTOGRAPHY, and the consequent correspondence at home for matter to make up these letters, has brought under my notice a large number of amateurs who are devoting themselves exclusively to scientific photography.

The Amateur Photographic Exchange Club has been conducive of much good to its individual members, as is evinced in the improvement shown in their proofs. Some of the least enthusiastic adhere to the specified times of exchange, while others, who "have the fever bad," exchange several prints each week. A grand excursion is talked of this summer; but the Club is made up of hard-working men, and I fear it will not be possible for them to make the time suit all.

It is thought that the Southern ports now in our possession will soon be re-opened to trade, and then I shall have some photographic news from the South to communicate. Sincerely hoping that this will soon take place, I am, with due regard, yours, &c.,

COLEMAN SELLERS.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—My attention has been called to a contribution from Mr. Grubb in your last number, in which he honours (?) me with some remarks of a personal nature—a matter which will cause me very little uneasiness; but, as *I am* a professional optician, with all my energy and every moment of my time absorbed by the duties of my calling, I have neither leisure nor inclination for entering into an optical controversy.

For the information, however, of those whom it may concern, I subjoin the grounds of my statement.

Some few years since, when Mr. Grubb introduced his "Patent Aplanatic Lens," I had occasion, in connexion with my late father-in-law, Mr. Andrew Ross, to institute a comparison between it and the ordinary meniscus form of view lenses, both as regards the quality of definition and extent of field covered, also the amount of distortion produced by each.

The lenses referred to were both of about the same diameter and focal length, viz., three inches diameter, fifteen inches focal length, aperture three-quarters of an inch; and, although definition is not the question at issue, I may observe, in passing, that the conclusions arrived at then were to the effect that a well-constructed meniscus lens of the ordinary form was in no way inferior to the "patent aplanatic" in this respect, a three-quarter inch stop being perhaps the largest which can ever be used with a fifteen-inch-focus lens for landscapes or architecture; and with this aperture the ordinary form exhibits no signs of spherical aberration, and consequent imperfect definition.

As regards the amount of field covered, when the stops are situated at the same distances from the lenses, both being of the same diameter, the ~~one covers~~ quite as much as the other. If, however, Mr. Grubb places his diaphragm nearer to the lens to cover a "great deal more," he can only do so at the sacrifice of flatness of field and correction of marginal pencils; and I believe this will obtain to the same extent as in a well-constructed combination of the ordinary form.

Next, to ascertain the amount of distortion, as produced by each of the two forms of view lenses. This appeared to me most readily obtainable by simple projection; for which purpose I traced the course of two rays, comprising a pencil of three-quarters of an inch in diameter, and at an angle of twenty degrees with the general axis of the lens, when I found that in both cases the amount of deflection of such a pencil towards the axis amounted to about four degrees. I happened to have these diagrams still in my possession, and it was by reference to them I made the assertion.

I now leave Mr. Grubb to show that the above does not obtain in his "patent aplanatic," and perhaps he can point out by what mysterious property his lens, unlike the ordinary view lens, is exempt from the production of (barrel-shaped) distortion.

In concluding this, the only letter I shall write on the subject, I would request those interested in this matter to look to *results*, as being perhaps the best proofs which can be adduced.—I am, yours, &c.,

19, *Bloomsbury Street*, J. H. DALLMEYER.
London, May 26, 1862.

To the EDITOR.

SIR,—From the importance which Mr. Grubb attaches to the *useful* discussion of this question, I presume his last communication is but *introductory* to others: if not, I must confess that I look upon it as another instance of a mountain in labour bringing forth a mouse.

I shall be much pleased to see the question discussed by one so able as Mr. Grubb; but I think it is to be *settled* rather by the results of practice than by the interpretation of a mathematical formula.

Will you allow me to say a few words on points raised by Mr. Grubb's letter, after which I shall not trouble you further on the matter.

At the outset he raises a distinction between the amount of subject included, and of sensitised surface covered. Now, if a lens is free from distortion, the one is directly proportional to the other; and as the best lenses *are* made so as to act without perceptible distortion, I think this distinction needless.

I still think that the illustration I gave (that of the opera glass) is applicable to show the difficulty of the attempt to ascertain the true focal length of an uncorrected lens. Of the power of the eye to bring parallel or *moderately* diverging rays to a focus the experience of every moment tells us; but that such divergence is very small we also know, for assuming least distance of distinct vision to be ten inches, and diameter of pupil one-fifth of an inch (about its mean diameter), we may say that in a pencil falling on the eye at its greatest possible divergence, so as to yield a distinct image, the rays are *almost parallel*. Now, if the object-glass of an opera glass, having a *determinable* focal length of a few inches, be moved by a very small fraction of an inch from that position in which the rays fall parallel on the eye, I think the divergency would be too great for distinct vision. Again: although the eye has this power of adaptation, it is *a work of time*, as is apparent by turning the eye quickly from a very distant object to one very near; but on turning the adjusting-screw of a *bad* opera glass continuously, no such lapse of time can occur, nor is it necessary.

I think that, by the means I stated, the true focal length of a lens may be ascertained within five minutes; and if photographers object to this I cannot but suppose they are altogether indifferent to the matter, and for such no method at all need be given.

That "kind friends" did warn me of the distortion produced by a single lens I admit. First taught this by my Cambridge tutors and text-books, I have been subsequently warned of it by the kindliest of all friends to the photographer—*the journals*. Surely Mr. Grubb does not wish us to suppose that his knowledge is not derived from like sources, but is innate: if so, we shall henceforth read a well-known maxim, thus—

An optician "is born, not made."

And, now, I must say that I never saw a more decided case of the "crying of stinking fish" than is deducible from Mr. Grubb's next remark, which concludes thus:—"That which Mr. H. condemns so emphatically in the editor's method of trial *exists in full force in his own.*" Surely he must be too scrupulous! That a maker of lenses *(one of the chief requirements of which is freedom from distortion)* should thus openly proclaim that the same amount exists as in an ordinary spectacle lens, is *too much to be realised* (as Lord Dundreary would add) "*by the same man on the same day.*" When I wrote the paragraph quoted I knew a lens to which the same objection did *not* apply in full force, and I may almost say, did not apply at all; and I thought also, and still think, that such objection would not "apply in full force" to Mr. Grubb's own lenses, although his excessive scruples would lead us to think otherwise.

Mr. Grubb seems determined to misunderstand me. I never for a moment supposed that the angle included by a triplet was not defined, but that on urgent occasions it could be coerced into doing more than it was wont to do at other times. Only one who has been "born" an optician could even dream of such a lens. The fact stated by Mr. Grubb —that by a change of the position of the stop he can vary the angle included—does not make the power of the lens any the less definite, if, as I suppose, there is a limiting angle beyond which such power does not extend. What I wished to express was this:—I frequently found that the lens with which I was working would have enabled me to get much better pictures had it included a little larger angle, and that I had subsequently found a lens that did include a larger angle than the other, and would consequently have given better results. "That's the idea."

I see from the Amateur Photographic Association catalogue that Mr. Edwards's pictures, to which I before alluded, are stated to be 9 × 7; and on inquiring of Mr. Melhuish, he told me he could not get them larger than this, so as to be satisfactory. My remarks relative to them in the last were almost word for word as I had received them—not immediately from Mr. Edwards (as I was not at home when he called), but from a friend with whom he left the message.

I have sent my triplet to a professional photographer in Cambridge, who is experimenting with it. I will let you have prints as soon as I receive any.

I am glad to know that Mr. Dawson is testing the merits of various lenses, with reference to the above question.—I am, yours, &c., D. HORNBY.

[Our correspondent will perceive that his conjecture relative to the introductory nature of Mr. Grubb's communication in our last issue is correct, and he will no doubt be gratified to learn that the issue will be settled strictly by *practice*. It is but fair to Mr. Grubb for us to state that we were in possession of the continuation of his paper, which appears in the present issue, *before* our last went to press; but want of space compelled its postponement.

We are not "troubled" by Mr. Hornby's letters, and trust that should he see cause to address us again on the present or any other subject he will not hesitate to do so. Let us have full and free discussion by all means.

There are several remarks which we feel it necessary to append to the present letter, in order to clear away misconception.

We have, for the moment, personally withdrawn from the discussion, preferring always to give place to contributors and correspondents; and when entering upon it we had no idea of others taking it in hand. If there be any room for comment or further elucidation when they have done we shall again take the subject up. We shall leave the various issues raised in the present letter to be answered by Mr. Grubb, though we perceive several propositions assumed as admitted facts that are either questionable or erroneous.

In correction of misapprehension, we may remark—

Firstly—That Mr. Grubb was an accomplished mathematician and non-professional optician long before optical science was enlisted in ministering to the photographer's art.

Secondly—That the Mr. Grubb, the maker of lenses, is not our contributor, but his son.

Thirdly—That no comparison at all was made in Mr. Grubb's article between an aplanatic and a spectacle lens; and that no distortion whatever is necessarily attendant on the employment of the latter.

Fourthly—That if Mr. Hornby will read some contributions from Mr. Grubb, which appeared in vol. vii., pp. 33, 45, and 92, he will perceive at once *why* the method of ascertaining the equivalent focus of an open combination by equality of size in the image and object is inapplicable.

And lastly—That, by the courtesy of Mr. E. Edwards and Mr. Melhuish, we have been enabled to ascertain that the lens No. 2295, by which the former took the picture of *Wippingham Church*, is of 7·85 inches equivalent focus, and that 9 by 6¾ inches is the *maximum* size of a parallelogram that can be cut from the field covered. On this we shall have more to say in due time.—Ed.]

RECOVERY OF WASTE SILVER.

To the Editor.

Sir,—Will you or Mr. Mabley be kind enough to answer the following questions referring to his paper in The British Journal of Photography for 1st May?:—

In the method of recovering silver from waste solutions by means of caustic soda and grape sugar, how much soda must be added to make the solution "caustic;" and does "caustic" mean only alkaline?

Can this plan be used for both washings and hyposulphite baths, and may they be mixed together?

Is the metallic silver precipitated pure enough to redissolve without fusion? If so, the trouble of heating the liquid is not to be compared with that of fusing the chloride or sulphide in the usual way, and I think this method will be of much service to many amateurs.—I am, yours, &c.,

May 20th, 1862. L. F.

["Caustic" does *not* mean merely "alkaline." Drop a little of the solution on the back of your hand and you will soon become aware of the difference by its acting upon the cuticle. We apprehend the method is applicable to both solutions, but should not recommend their being mixed together.

As we have not experimented in the manner described, we are at present unable to state whether the silver reduced is sufficiently pure for re-solution in nitric acid without fusion. Possibly Mr. Mabley will kindly reply to your inquiries.—Ed.]

ACCELERATORS.

To the Editor.

Sir,—Will you have the kindness to inform me what the most powerful accelerator for collodion is, as I have tried iodide of iron, but even with that addition find the collodion very insensitive as compared with some in the market—Mawson's, for example, giving a picture in half the time.

I added four drops of a saturated solution of iodide of iron to the ounce of collodion: is this sufficient? I am, yours, &c., B. W.

[It is quite a mistake to suppose that the addition of anything at present known to collodion will act as an accelerator. Pure chemicals carefully prepared and used with intelligence, are the only real accelerators. See papers by Mr. Blanchard and Mr. England lately published.—Ed.]

EXPOSURE.—STEREOSCOPIC TRANSPARENCIES.

To the Editor.

Sir,—1. I herewith enclose you three proofs of *Breadsall Priory* for your inspection. I shall be glad if you will tell me what you think of them. They were taken with a pair of lenses of four and a-half inches focus, with smallest stop but one. Length of exposure:—No. 1, two minutes; No. 2, two and a-half minutes; No. 3, three minutes. It was the first time I had tried the lenses with dry plates. I think No. 3 is best in point of exposure. The process I used was the original Fothergill, as described by Mr. Bourne in The British Journal of Photography. You will perhaps notice (especially in Nos. 1 and 2) that the house is wider in one picture than in the other. I found the reason of that, I believe: the brass setting on one of the lenses allows the lens to be nearer the ground-glass than the other. I focussed the pictures with the camera and rack motion alone, and not with the lenses.

2. Will Messrs. Horne and Thornthwaite's albumenised paper (the same as the enclosed prints) do for the development printing process?

3. What kind of frame should I have for *printing stereoscopic transparencies* in two operations? I suppose the frame should be half as long again as the plate, with some arrangement for stopping off the light from that half of the sensitive plate to be used for the second operation.

Belper, May 21st, 1862. I am, yours, &c., W. S.

[1. The subject chosen requires long exposure because of the great contrast. It would have borne even more exposure than No. 3 with advantage, which, however, you have over-developed. No. 2 is from the best point of view. No. 3 would have been better if taken from a spot more towards the right hand. You would probably have found the exposure of No. 3 enough had you developed very slowly.—2. We see no reason why it should not.—3. Yes; but it involves also shifting the glass upon which the proof is being taken.—Ed.]

MANIPULATION.

To the Editor.

Sir,—Will you kindly answer me the following questions?

1. What is the action of *acetate of soda* in the iron developer? and should it be used in the same proportion winter and summer?

2. After fixing a negative once in hyposulphite, and re-intensifying with pyrogallic and silver, does it require fixing again in the hyposulphite?

3. What causes some prints to turn of a pinkish hue in the toning bath?

4. What must I do to prevent the negative fogging after diluting the collodion with ether or ether and alcohol?

5. Can you tell me the cause of the stains in the enclosed *prints?*

I am sorry that my ignorance compels me to trouble you so much. Thanking you for past favours, I am, yours, &c., E. B.

[1. The formation of a small quantity of acetate of iron. It is supposed to produce intensity, but, in our opinion, it is useless.

2. No: only thorough washing.

3. Impossible to decide without further information. A deficiency of chloride and excess of albumen will sometimes produce this effect.

4. I fthe negative "fogs" under such treatment, add a drop or two of dilute tincture of iodine to the collodion, just to turn it a light straw colour.

5. Yes: incomplete removal of the nitrate of silver before fixation, *or* too weak a fixing bath. It is a case of photographic measles.—Ed.]

MANIPULATORY DIFFICULTIES.

To the Editor.

Sir,—You would greatly oblige me by answering the following queries on certain difficulties I experience in amateur photography:—

1. In varnishing a negative I use what I have always heard is the best, Vernis Soehnée; but I have no sooner poured it over than a number of small specks begin to appear, and when they fall on the face in the portrait they spoil it. How is that to be avoided? Would filtering the varnish answer? and how should it be filtered?

2. In toning prints I use an acetate of soda toning bath, with which I can tone one or two prints when I have occasion, returning the solution into the bottle; but what I wish to know is, will the hyposulphite bath be injured by being used in the same way?

3. I have always strengthened negatives, after developing with iron, with pyrogallic acid, two grains to the ounce, and a few drops of nitrate of silver, mixing a sufficiency in a small glass, and I used to pour the mixture on quite clear: of course it grew turbid after long pouring. But now the moment I mix the silver with the pyrogallic solution the mixture becomes black, and I have tried different samples of pyrogallic acid, distilled and other water, but all to no purpose. Can you understand why this should occur when it used not to do so?

4. I have some Ponting's and other good collodion, which is in securely-corked bottles, and has been iodised for three years. Can I use this old collodion in any way, or must it be considered useless? It is quite limpid, and pours out pleasantly. I thought of mixing it with freshly-iodised collodion: would that do any harm?—I am, yours, &c.,

May 20th, 1862. W.

[1. No doubt your varnish has contracted insoluble particles of matter from being repeatedly used: filtration is probably the only remedy. To accomplish this you must exclude the air to prevent evaporation. See paper by M. Mc-A. Gaudin, Vol. VIII., p. 236.

2. We do not admit the accuracy of your implied assertion that you can use the toning bath and return it to the bottle without injury; and the use of the hyposulphite of soda bath "in the same way" would be to lay a sure foundation for a number of faded proofs.

3. Your present non-success is easily accounted for—higher temperature. Remedy: more acetic or citric acid. Use distilled water.

4. We see no reason why the collodion need, of necessity, be useless. Try it, and even if you find it somewhat slower than formerly it may still be serviceable. If bad, you had better not mix it with fresh: if good, there is no need to do so.—Ed.]

MR. HANNAFORD'S MODIFICATION.

To the Editor.

Sir,—In The British Journal of Photography for April 15th, page 158, Mr. Hannaford says:—"Add one drachm of a 30-grain solution of nitrate of silver to the ounce of albumen, then add ammonia till the albuminate of silver is dissolved." What is the silver thus dissolved?—nitrate, albuminate, or ammoniate? And what effect will it have on the plate? I have been working twelve by ten in. plates by the formula of the hot water process. It has given very good results and few failures, but works very slow. The enclosed view was exposed fifty minutes—full daylight—a Ross's single lens 22 inches focus, half-inch stop. (Would the addition of silver to the albumen shorten the time of exposure?) This view was taken last week, and the plate was prepared and sensitised last June, and the keeping properties are all that can be desired.

If you or your correspondents can suggest any means to shorten the length of exposure I should feel obliged.

I have tried the orthographic lens, but find it much slower than the single lens. Can you inform me whether any other lens would work quicker?—I am, yours, &c. AN OLD SUBSCRIBER.

[If you will refer again to Mr. Hannaford's note you will find it clear enough. The compound dissolved by the addition of ammonia is the *white cloudy precipitate* which occurs on the addition of nitrate of silver to albumen. Its action is no doubt accelerative on the plate. We recommend you to employ, in preference, the plan suggested by Mr. Barber, viz., to add ammonio-nitrate of silver to dilute albumen, say one drachm of a 30-grain solution of ammonio-nitrate of silver to an ounce of albumen and five ounces of distilled water. With a lens of such long focus you might have used an aperture of almost double the diameter, certainly three-quarter inch. The time you mention is preposterous: there must be something amiss with your chemicals. We do not expect you could get any lens to work more quickly than the one you now employ. It must be your collodion, bath, or developer that is in fault.—Ed.]

FOTHERGILL PLATES.

To the Editor.

Sir,—Would you have the kindness to answer me the following queries through the medium of the next number of your valuable journal?

1. Can a Fothergill plate be washed *too much* after the albumen has been applied? I expend a quart over a 6¾ by 3¼ plate.

2. Is the use of decomposing rain water for the above, and also for the washing after the nitrate bath, sufficient to account for stains and sundry other irregularities in the developing process, such as the picture being for a negative very faint and weak, no intensity, and yet showing tolerably well as a positive? Or is this latter owing to the plate being left too long before immersion in the nitrate bath, after it has been coated with collodion? I use ———'s negative.

3. Do you think I should find greater regularity and certainty in the tannin process, combined with sufficient intensity and keeping properties? Should I do well to change? I have got some satisfactory results with the Fothergill process.

As my time for the practice of photography is limited (I have only three months, and plenty of work for my camera), it is important that I should be in good working order for the field as soon as possible.

May 27th, 1862. I am, yours, &c. G.

[1. Some authorities say that the plate cannot be washed too much either before or after the application of the albumen. We should consider a quart of water after the albumen a small dose: we fancy half-a-gallon is nearer to the quantity we use.—2. You cannot really mean *decomposing* rain water, but water containing organic matter in a state of decomposition. This is quite unfit for the purpose. It accounts for the stains, and may do so for the weakness of the image; but this may also arise from other causes (acidity in the nitrate bath, for instance), but not from being left too long before immersion.—3. If you were succeeding with your present process we should advise you not to change; but, as you are only partially successful, you will probably do well in adopting the tannin process, which is excellent both in principle and practice.—Ed.]

NON-ACTINIC SILK.

To the Editor.

Sir,—I beg to enclose for your inspection a sample of a new preparation of varnished silk for the dark room, tents, &c. I have found it to be superior to any kind of yellow glass, &c., by actual trial with a wet plate in the full sunshine. All the other materials I tried gave a deposit on developing, more or less, except the new silk, which does not show the slightest trace of actinic action. I intend to manufacture it for sale, as I think it will be a valuable article to photographers generally.

The negative may be seen at Messrs. Murray and Heath's. If you should be passing that way and will call and see it, I think you will be convinced of the efficiency of the medium. Should you deem the silk worthy of notice, a word in its favour in the Journal will much oblige, yours, &c.,

2, *Canterbury Terrace, Beresford Street, Walworth, S., May 27th*, 1862. C. W. SMARTT.

[The specimen received is of a deep orange colour, but we have not had an opportunity of testing its efficiency.—Ed.]

ANSWERS TO CORRESPONDENTS.

Erratum.—In Mr. Thompson's paper on the opening of the Exhibition, in our last number, a typographical error crept in. In page 186, first column, line 23 from top, for "Cordelia" *read* "Cornelia."

R. Smith.—Received. Under consideration.

Nathan.—We have already declined the honour.

Alpha.—Certainly you can, if you go to work the right way about it. Read the papers recently published by Dr. Maddox and Mr. Bockett in our pages.

Jules Jadin.—R. F. L.—Maria.—Thanks for suggestions and good wishes. We will endeavour to see if any of the former can be made available.

Roving Rob.—We understand that Mr. Smartt has made an improvement in his tent with regard to the window, and shall probably have particulars shortly.

Gregory L.—It did not reach us in time for our last issue; and, if truth must be told, we were not sorry, being what our Yankee brethren call "crowded out."

Pyro.—For ordinary portrait work in warm weather we prefer a pyrogallic developer; but in the winter time we have found some advantage in the substitution of an iron salt.

A. F.—Do you wish us to publish your account of the transaction? If so, you must send your name and address, as we are not acquainted with the facts, and cannot be responsible for them.

R. S. T.—Your pose is very awkward and inartistic. Put the picture far enough off to prevent your observing the details, and you will find it remind you of a pair of tongs leaning against a door.

Maude.—You have scarcely had practice enough to "run alone" yet. Do not be too eager to get out of leading strings. Stick to your formulæ, and work by rule until you are quite familiar with your work.

Geo. Dines.—The makers of collodion named in your list are all producers of excellent materials except No. 3, and he is simply a seller of the articles made by others; but, for aught we know to the contrary, what he sells is good.

M. D.—The lenses of the maker named are good, but we have not tried the particular kind you specify. The others to which you allude are higher priced; but they are *not* dear. We should advise you to stretch a point and procure one of the latter.

Bromide.—Wait a few months and most likely you will find "the wind sets from the opposite quarter." There is scarcely any one point upon which the writer you name has not held diametrically opposite doctrine at different times. He is certainly wrong in his present mood.

Jacobus Lex.—Your manipulation is now excellent: we shall be glad to have the details of your method of working minutely described for the benefit of our readers. Your *Hill of Cluny* and the *Water Mill* are first-rate productions. We fear there is no absolute immunity with regard to the spots in paper. We believe the rollers mentioned are well adapted for stereographs.

F. Barnes.—Your choice appears to be between several evils, one of which at any rate would be fatal to the attainment of your object. Upon the whole, we think you had better be content to dispense with living subjects, and manage to convey the idea of magnitude by the interposition of something used by man in order to indicate the scale; for instance, a cart or wheeled carriage of some kind would answer the purpose.

R. T.—The idea of enclosing collodion in hermetically-sealed tubes for foreign use is good, but, unfortunately for you, *not new*. The practice has been long ago adopted by Mr. Hockin, of Duke Street, Manchester Square, London; and, if we are not mistaken, samples of his collodion so packed may be found in the photographic garret at the International Exhibition. We can quite understand that you may have overlooked it in such a locality.

A Member of the North London.—The reason that the nitrate of silver solution does not run freely over the plate is not from its age, but its newness: it has not acquired enough alcohol. The addition of a little pure alcohol would no doubt remedy the evil; but we cannot think that the solution would not flow readily if you gave plenty of time—say ten minutes. We are unable to suggest any better place than you name to procure albumenised paper.

P. W.—We can perceive no valid reason why your positives should turn dull and brown on drying, if you have *correctly* described your method of working. Perhaps you have added *methylated* spirit to your developer: this might have a detrimental influence. We know of no better positive process than that described at page 40 of the *British Journal Almanac*. If you are using pure alcohol in the developer try a change of collodion; and if you still find fault with the result, then try the following developer, viz., protosulphate of iron fourteen grains, nitrate of potash ten grains, water one ounce, acetic acid thirty minims.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 168, Vol. IX.—JUNE 16, 1862.

At the Photographic Society.—The last meeting of the Photographic Society was, on several accounts, a singular one, having been devoted to the consideration of a subject but very remotely connected with our art, it being rather the application of it to other than photographic purposes. Certain propositions were advanced which, to say the least, were open to question; yet, instead of inviting discussion upon the paper read, which was avowedly opposed to the views promulgated at the preceding meeting, the Chairman appeared to be somewhat ludicrously anxious to prevent it altogether, discouraged it effectually, and pronounced a decision *ex cathedrâ* that we are mistaken if he do not hereafter see occasion to modify. We are not so simple as to question the mathematical attainments of Mr. Vignoles. His reputation is not unknown to us; but we have yet to learn that from data, the chief one of which is an inconstant quantity, constant results arise. Now we imagine Mr. Vignoles to have overlooked the necessity for ascertaining whether his data were trustworthy before pronouncing judgment. Time will show whether we are right. However, to proceed:—Our friend, Mr. Mayall, having satisfactorily to himself and some others demonstrated that there was nothing new in the principle or application of Woodward's solar camera, by the exhibition of a solar microscope constructed for photographic purposes for Dr. Carpenter by the late Mr. Willatts, at Mr. Mayall's instigation, appropriately (!) concluded by deprecating any opposition to a *new invention*, alluding to the said solar camera. Finally, Mr. Warner (of Ross), not being at all convinced by M. Claudet's reasoning, attempted to elicit some further information, but was incontinently cut short by the Chairman upon the ground of its being late, and who thereupon pronounced the decision before alluded to, and immediately afterwards vacated the chair.

A word of explanation on the method adopted by M. Claudet for shifting the screen and image alluded to in his paper *On the Enlargement of Photographs* (page 225) may not be amiss. The way in which the various portions of the negative are brought to bear upon the centre of the lens in succession is by means of two motions at right angles to one another and to the axis of the lens, just as with the "mechanical stage" of a table microscope, corresponding motions being applied to the screen carrying the canvas or paper upon which the drawing is being made. These, when in use, of course are moved in opposite directions.

It may probably be remembered that at the previous meeting of the Society, a trial of skill between Messrs. Claudet and Heath, relative to enlargement from small negatives, was arranged. The results were laid before the June meeting. Each gentleman enlarged to four diameters a proof from one of his own negatives and from one of his opponent's—the two negatives employed being the same in each case. M. Claudet's specimens were upon plain, Mr. Heath's upon albumenised paper. Those of the former retained much half-tone and were generally clear in the lights, but were very deficient in definition: those by the latter were somewhat hard, the half-tone being rather deficient, and the lights not quite so clear as they should be; the definition, however, was very good. Optically, therefore, Mr. Heath came off victorious; but artistically M. Claudet bore the palm. Now had Mr. Heath been content with plain paper we fancy his half-tone would have been better, and his "hardness" not so prominent, while his definition was sufficiently good to have borne a trifle of degradation without much detriment to the enlarged proof. The question is scarcely yet settled in practice—theoretically we never had any doubt about it.

American Notes.—There are one or two matters in our American correspondent's letter in the current number upon which comment from us may be appropriate. With respect to the observation made by Mr. Sellers on salting plain paper, he says, "some will immerse the paper and allow it to soak, while the majority only 'draw it' once through a strong salting solution." From the expressions employed he seems to convey the intimation that this difference merely arises from habit or education, and that it is not material which method is adopted. We can scarcely concur in this view. The "majority" certainly work upon sound principles in this instance, for the soaking tends to produce the impression in the fabric of the paper, causing a sufficiently vigorous proof when viewed by transparence, but flat and weak when examined in the ordinary way. The additional brilliancy of proofs upon albumenised paper is owing as much to the image being confined to the surface as to the extra smoothness of the surface itself. The same principle holds good with plain paper: the more the image is kept on the surface the more brilliant it is.

The suggestion for the drying rollers to be employed for paper proofs appears to be worthy of attention.

The mention of Dr. Smallwood's photographs of snow crystals induces us to recal to the recollection of our readers the very beautiful photographs of similar bodies produced several years back by our friend Mr. Glaisher, of meteorological celebrity. These were very numerous, and of considerable dimensions, being about six inches in diameter; but we believe they were not taken directly from the microscopic objects themselves, but from enlarged drawings of the same—photography having been employed only for the multiplication of the pictures.

We find that some remarks we made at one of the meetings of the Photographic Society appear to have given umbrage to some of our American brethren, and we are obliged to Mr. Coleman Sellers for having correctly interpreted our observation. We allude to what was said about "instantaneous" impressions upon *dry* plates. We had no idea of asserting that the American notion of "instantaneous" proofs generally differed from our own; but that applying the term to any works which we had seen upon *dry* plates must be regarded as an excess of courtesy. We have not forgotten several excellent instantaneous views of Broadway, New York, which we received from Mr. Anthony, and noticed in Vol. vii. p. 114, but these were taken upon ordinary moist collodion. The point under discussion when we made our remarks were, on the contrary, the attainment of a sufficiently sensitive dry film for receiving instantaneous impressions.

Landscape Album.—With reference to the hint thrown out in our last, we have been favoured by Mr. Warner, of Ross, with some interesting specimens of small landscapes and architectural subjects upon *cartes de visite*, for insertion in the handy albums now so popular for portraits; and he also informs us that he contemplates bringing out shortly just such an album as we suggested, to take in one of a pair of stereographs. Many specimens of Mr. Warner's present series are very pleasing, which comprise scenes from all parts of the kingdom: they are certain to become popular, but the introduction of a special album adapted for them will, we fancy, give an astonishing impetus to the demand for them.

Redivivus.—Since our last we have been informed of the formal dissolution of the City of Glasgow and West of Scotland Photographic Society; but our regret, in making this announcement is materially softened by our being able at the same time to intimate the probability of the Society arising phœnix-like from its ashes, with renewed youth and vigour. We publish in another column a note bearing upon the subject.

ON THE USE OF BROMIDES IN COLLODION.

By George Dawson, A.M.

Lecturer on Photography at King's College, London.

The question of bromides in collodion has again, I see, become the subject of strong contention in some of your contemporary journals. About five years ago, when the pyrogallic-acid developer for negatives was almost exclusively employed, I, in conjunction with a friend well versed in photographic chemistry, went through a series of experiments for the purpose of settling the point at issue. We worked independently of each other with different chemicals, and only compared notes at the end of the series. Our conclusions were pretty nearly alike in all points; but in this opinion we were perfectly agreed, viz., that the use of a bromide, combined with an iodide, had a retarding instead of an accelerating effect, and tended strongly to the production of feeble negatives. It should be borne in mind that we worked only with pyrogallic acid and the potassium and ammonium salts. This conclusion, forced on us by the facts, seemed the more surprising inasmuch as a previous series of experiments in connexion with the waxed-paper process showed that the addition of bromide, in the proportion of one to two of iodide, reduced the time of exposure by nearly one-half; while farther addition began again to exercise a retarding and fogging effect. We made some attempts to reach the cause of this curious anomaly, but failed in our endeavour.

Having had occasion during the early part of the present spring to repeat my experiments, considerably modified and on a more extensive scale, both with iron and pyrogallic developers, and with the iodides and bromides of different metals, I still remain of opinion that with a pyrogallic developer the presence of a bromide in the collodion is a positive injury, and remarkably so when conjoined with the iodide of potassium or ammonium. With the iodide of cadmium the effect is slightly different. For instance, supposing we have dissolved a sufficient quantity of pyroxyline, free from all trace of acid, in pure fresh-washed ether, and the proper proportion of alcohol, specific gravity ·805, and iodised with cadmium, we shall find great difficulty, even in a slightly-acid bath, of obtaining anything better than a faint, blurred, foggy negative, until the collodion has been kept for several weeks. The addition of one grain of any bromide to each ounce of the collodion at once corrects the fault; and, although it does not seem to me to increase the sensibility, it undoubtedly gives greater clearness. But pyrogallic acid as a preliminary developer is fast giving place to iron, and here it is that the advantage of bromides is very conspicuous. My experience will not warrant me in saying that their presence increases the sensibility of collodion or the opposite; but they do give a clearness and incipient vigour to the image, which is easily raised to a fine gradation of tone by subsequent redevelopment with pyrogallic acid and silver.

The value of the bromides in the dry processes is undoubted, both in increasing the sensibility and clearness of the negative. They may be used, I dare say, in something like the same proportion I have found the best for the waxed-paper, viz., one of bromide to two of iodide. I do not pretend to explain this seeming anomaly. The fact is nevertheless certain, and deserves a more careful and methodical investigation than it has hitherto received. Mr. Sutton, while discussing this subject, has said:—

"The film of bromide of silver is very slowly formed in the nitrate bath, requiring, sometimes, as much as a couple of hours to convert the whole of the bromide of cadmium into bromide of silver. But the film of iodide of silver is fully formed after the plate has been immersed a few minutes in the bath. If, then, a plate is removed from the bath after it has only remained on it a few minutes, some undecomposed bromide of cadmium will remain on the film, and this will, no doubt, render it less sensitive. But we are now speaking of a pure neutral nitrate bath. Suppose the bath or the film to contain traces of a strong acid, such as nitric or oxalic, it is then easy to see that this will attack the cadmium and liberate the bromine, allowing it at once and promptly to combine with the silver, and form bromide of silver in the film. The proof of this is, that if you add nitric acid to a solution of bromine of cadmium you at once liberate bromine and form nitrate of cadmium in the solution. It appears, therefore, that a strong acid in the film (produced by free iodine or oxalic acid in the collodion or nitric acid in the bath) assists the rapid formation of the bromide of silver, and thus renders the bromo-iodised collodion more sensitive."

This is very ingenious and plausible; but let us examine the theory a little more closely. Is it true that the bromide of silver is less rapidly formed than the iodide? The change indeed is in both cases effected immediately a sufficiency of the nitrate has come in contact with the other salt, and the presence of no acid will hasten or retard the decomposition. Although a bromised film will not assume the creamy appearance of an iodised film, it does not follow that the whole of the bromide has not been converted into bromide of silver, since there is no more difficulty in the nitrate permeating the film and decomposing the bromide than the iodide. All photographers must have observed that some specimens of collodion fully iodised will, even after a lengthened immersion, give a pale opalescent film, while others containing less iodine will show greater density and creaminess. I believe the nature of the collodion itself has more to do with this than the quantity of iodide or bromide which it may contain.

Again: let us suppose the collodion contains free acid. Surely the effect of this would be to decompose the bromide and iodide—not during the few minutes immersion in the bath, but previous to the coating of the plate, whilst the collodion was reposing for weeks or months, as the case might be, in its bottle. When decomposition of this sort takes place, and it can only occur under the conditions mentioned, it will make itself very manifest in the high colour of the collodion; and every one knows that this state of things is anything but conducive to sensibility. In short, an acid, whether in the bath or in the collodion, cannot, in any way consistent with chemical laws, assist in the formation of bromide of silver. The great affinity of bromine for silver renders their combination complete the instant they come in contact; and it is only the nitric acid thus set free that will combine with the base of the other metal, both being in the nascent state. Should any free nitric acid have been in the bath before the plate was immersed it will remain there in quantity as before. The same is true of oxalic or any other acid. Neither oxalate of cadmium nor ammonia (or whatever the base of the bromide is) will be formed during the immersion of the plate, whether the acid exists in a free state in the collodion or in the bath. In the former case the oxalate is already formed before the plate is coated, and in the latter there is no tendency to its formation. If, therefore, it be true, as Mr. Sutton asserts, that the formation of a bromised film is hastened by the presence of free acid, we must look for the explanation in a different direction to that which he has indicated; and probably we shall find it depends more on mechanical than chemical action.

ON THE EQUIVALENT FOCUS OF PHOTOGRAPHIC LENSES, AND THE ANGLE OF SUBJECTS INCLUDED.* (DISPLACEMENT AND DISTORTION.)

By Thomas Grubb, M.R.I.A.

The prominence which "displacement" and "distortion" have assumed in the discussion of "What a Lens will Cover" induces me to relinquish the order in which I had intended to treat the question at large, and to devote this article to redeeming the promise made in my last, of showing what the displacement and consequent distortion is (and is not) in the case of a single combination view lens.

I reply shortly in a letter (for insertion under the head of "Correspondence") to Mr. Dallmeyer's of last number. *Here* I may

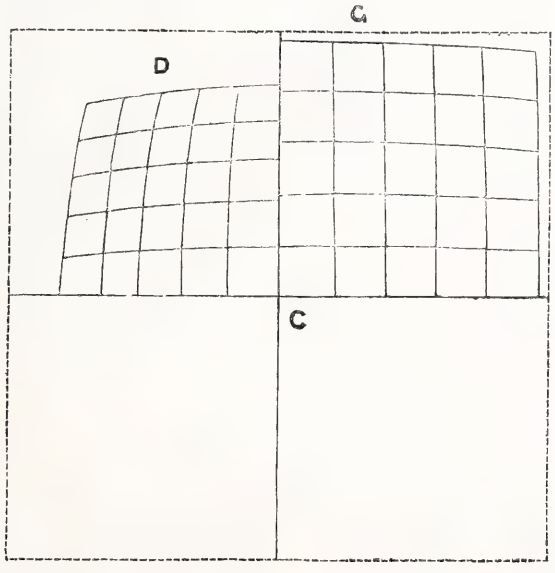
* Continued from page 206.

say shortly in reference to it that I consider I have *fairly* thrown down the gauntlet in reference to the question. He has asserted that which would (if true) be highly damaging to a certain class of lens. His assertion is that, "when taking a view" (under certain given circumstances), "the angle of deviation or displacement of objects at the extreme margin of picture amounts to no less than 4°" (on either side). I have said it *does not amount to* 1°, and I estimate the true quantity for a certain lens of the class at about one-sixth part of his asserted quantity, or say forty minutes of a degree instead of four degrees. Now, Mr. Dallmeyer has had ample time, after being warned of his error, to reconsider his statement. In his letter of reply (while he tacitly adheres to it), he *neither repeats nor proves it.* Instead thereof, he indeed offers a quasi proof by proposing that I shall prove that which *I know to be wrong*, and assumes that *if I don't, he must be right!*

I now proceed to show, from the results of actual experiment and data derived therefrom, not merely that the deviation (and consequent distortion) is not what Mr. Dallmeyer has stated, but also what both these are, and *that* with all the accuracy practically useful.

But, to avoid all liability to be misunderstood, I desire to premise that I am perfectly alive to the circumstance that Mr. Dallmeyer has said nothing respecting *distortion.* 'Tis only the soft impeachment of "displacement" of the objects which he has as yet urged; but, as in the case before us, *distortion follows "displacement"* as surely as marriage includes a wife (or husband), so surely does Mr. Dallmeyer, *in limine*, warn photographers against (his fancied) distortion, although for the present he only *says* "displacement."

Mr. Dallmeyer in his concluding paragraph recommends persons interested to "look to results" (I find I cannot help referring to his letter). Now, I shall begin my "exposé" by exhibiting a double diagram, the result of a careful experimental examination into the matter. The data on which this diagram is based will be



given in due time. That portion of the diagram corresponding with Mr. Dallmeyer's assertion is marked D, and that corresponding with actual trials is marked G. The lines of each represent a *corner quarter of a field of* 40°, of which C is the centre common to both. The dotted lines show the size which a lens of no distortion and of same focus would cover, when including 40°.

I would, firstly, appeal to the hundreds of photographers who are using single combinations (aplanatic and non-aplanatic) whether they ever experienced, except with *a tilted camera*, a displacement or distortion having any pretensions at rivalling the side marked D of the diagram in a quarter of a field of 40°? Leaving this not very knotty question without any doubt as to its solution, I proceed to describe how the results given on side G of the diagram have been obtained.

A No. 3 Dallmeyer triplet, purchased with special care in reference to its being first-rate, of nominal (or "back") focus of 12 inches, and a C aplanatic of nominal 15 inches focus (the actual foci being 14·02 and 14·51 inches, and the surface covered when including a field of 40°, differing by only $\frac{1}{50}$th of an inch), were mounted so as to be readily used *seriatim* with a camera of 17 by 14 inches, the ground-glass of which was marked with a central horizontal line of divisions of tenths of inches. The camera was placed in a window commanding a general view, and on an apparatus which allowed of the camera being turned on a centre beneath, and an instrument equivalent to a theodolite was placed on top: by the aid of these the camera could be turned through any desired angle with an accuracy equal to one minute of a degree.

The triplet lens being now attached, the image of a certain well-defined object was made to coincide with the central division of the scale on the ground-glass, the theodolite reading zero. Next, the camera was (by the aid of the theodolite) turned through successive angles of 4°, 8°, 12°, 16°, 20°, 24°, 28°, and 30° on each side of the centre, and the divisions and parts of the scale on the ground-glass over which the image had moved were registered at every operation, and the results tabulated. The triplet lens was then removed and the aplanatic lens attached, and the same process repeated. The mean of the readings for both lenses, together with the true tangents for the focus of each lens and their differences, are given in the annexed table.

Angle from Centre.	A.	B.	C.	D.	E.	F.	G.
	Mean of Measures.			Tabular or true Tangents for Focus of Triplet.	Difference of Columns A. & D. Triplet.	Tabular Tangents for Focus of Aplanatic	Difference of Columns B. & F. Aplanatic.
	Triplet.	Aplanatic.	Difference				
4°	0·98	1·015	+0·025	0.98	0·00	1·015	0·00
8°	1·96	2·025	+0·065	1·97	−0·01	2·040	0·015
12°	2·98	3·035	+0·055	2·98	0·00	3·085	0·050
16°	4·03	4·065	+0·035	4·02	+0·01	4·162	0 097
20°	5.12	5·10	−0·020	5·10	+0·02	5·283	0·183
24°	6·26	6·17	−0·090	6·24	+0·02	6·460	0·290
28°	7·35	7·27	−0·080	7·45	−0·10	7·715	0·445
30°	8·15	7·81	−0·340	8·09	+0·06	8·380	0·570

From this table I find the "displacement" of the image of the aplanatic to be—for a pencil incident on the lens at 20° from the axial—40* minutes of a degree only; and from this datum, and assuming the displacement for different distances from the centre to be as the squares, the double diagram D G is constructed. Had I used the ratio indicated by the table (which is higher than that of the squares) the difference between D and G in the diagram would have been still greater.

I have now given a convincing and *tangible* proof, capable of verification by any one who chooses to take the trouble, of the very great error of Mr. Dallmeyer's assertion. Perhaps, however, the proofs I have adduced will be rendered still more complete and satisfactory when, without attempting to disturb that 4° of *deflection of the pencil* which seems to be Mr. Dallmeyer's great stumbling-block, and with which I was in all probability acquainted many years before he was—and, further, when, without pointing to any "mysterious property" in my lens, or enlisting any kind of black art (even the photographic) in the service, I show, not only that the aforesaid "deflection of the pencil" of 4° is entirely compatible with a displacement of the image of only 42 minutes, but, in addition, that the lens would *without said deflection possess an unbearable amount of the opposite kind of distortion.*

These can be readily shown. I shall not, however, further trespass on your space in the present number, but reserve the matter, simple as it is, for a portion of my next communication.

ON THE ENLARGEMENT OF PHOTOGRAPHS.†

By M. Claudet, F.R.S.

The possibility of enlarging small photographs is at present engrossing the attention of the photographic world; and there is no doubt that it is a considerable advantage in many respects. Small pictures are obtained with the greatest facility, and with a perfection which cannot be obtained by large lenses and complicated apparatus. For taking views the operator need not encumber himself with a heavy baggage, and he may carry all his appliances packed in a moderate compass. Small glass negatives are less subject to be injured or broken in travelling, and may be contained in a light box. For taking portraits the preparation of plates is very simple and rapid, the pose is nearly instantaneous, and consequently the expression is not constrained and unnatural. Small lenses operating at a great distance from the sitter give an image without distortion and exaggeration of perspective. All is

* More accurately 38 minutes. The tabular error of the aplanatic—see column G.—for an angle of 20° from the centre (or a field of 40°), is 0·183 inches, which is exactly the difference between the tangents of 19° 22′ and 20°—for that lens.

† Read at a Meeting of the London Photographic Society, June 3, 1862.

perfect in small pictures; and before an audience of experienced photographers I need not do more than mention the fact that if we enlarge such small pictures we can obtain portraits of great beauty, characteristic in countenance and correct in forms.

The solar camera is the means by which we are able to enlarge photographs, and if we could depend upon the sun more than it is possible in our latitude and climate, nothing would be easier than this operation; but unfortunately the sun does not shine every day, and we may be sometimes waiting for its beneficial influence during many long weeks.

This difficulty has induced some persons to replace the light of the sun by artificial light, and the electric light has been tried with some success; but this is a very difficult and expensive process which very few operators could practically employ.

During the months preceding the reception of photographs at the International Exhibition, wishing to prepare enlarged photographs for my contribution, I was constantly watching for the appearance of the sun, and I may say that during five months I hardly saw it more than ten or twelve days. Still I have been able to produce all the specimens which have been admitted at the International Exhibition. They are all from negatives of *cartes de visite*, enlarged seven or eight times; and I hope the result will prove what can be expected from the solar camera during the clear days of the fine season.

The enlargement of negatives, however, has some limits, when we wish to produce black photographs. I think that an enlargement of from six to eight times is the greatest proportion which ought to be employed. But if you wish to enlarge *cartes de visite* to the size of nature, the small defects imperceptible in the negative are magnified to a degree so apparent that the picture requires considerable touching and correcting in order to give to it the appearance of a perfect and clean drawing worthy of being framed. These corrections, however, can be made without altering the character of the photograph, which has all the qualities of the small *carte de visite*, preserving the proportions of all the forms and the natural expression of the countenance. The result is far preferable to all the attempts made for producing at once large portraits with lenses of considerable aperture, which require a long sitting, distort the proportion of the figure, and, if the model has not moved, inevitably exhibit the forced expression of a sitting too much prolonged. Although, as photographs, many parts of the figure which may be in the right focus require very little touching, still the greatest part is so ill-defined and so much out of proportion that it is absolutely necessary to modify them considerably. The touchings of enlarged photographs, at all events, can be done without altering any proportions; and when these pictures are destined to be painted or coloured they are even in a better condition for the artist than more strongly-marked photographs of a large size taken direct.

Large photographic portraits in general are not very agreeable in effect, and, to please the public, they require colour. The more perfect the photograph is the more it shows all the defects of the face. It is not very desirable to exhibit all the roughness and every wrinkle of the skin in black lines. For this reason some artists, not understanding the impossibility of imparting the same degree of softness to the whole picture by it, have recommended to operate a little out of focus. Certainly if all the parts of the picture had the same focus it would be of some advantage, for the artistic effect, to obtain an image in which every part would be slightly out of focus to the same degree—just enough to soften the hardness of the lines; but this cannot be obtained, because if some parts which would have been in the right focus were softened by a slight alteration in focussing, this would render the other parts already in bad focus perfectly confused and indistinct.

The principal object of taking photographic portraits as large as nature is to give to the artist a ground to paint upon, containing a correct representation of all the features, forms, and draperies, which he can follow until the picture is so far advanced that a short sitting of the person is sufficient to impart the exact colour of the eyes, hair, and complexion. But it is evident that as soon as the artist has begun, and the more he advances in his work, his colours cover and hide the photograph, and that it becomes very difficult for him to go on without losing the likeness if he had not always before his eyes another copy of the same photograph, to which he can constantly refer in order to see when he is erring, and which enables him to correct any false touches of his brush. It would really seem that a skilful painter does not strictly want to paint upon the photograph—that he might as well trace the enlarged photograph upon his canvas to form the base of his painting, and to keep the photograph for his guide. In this case he might paint upon a canvas properly prepared to receive the colours, and not affected by the strong shadows produced by the nitrate of silver upon a surface of paper which has had to undergo a quantity of washings and manipulations. Without speaking of the immense difficulty of producing a photograph upon a surface of paper large enough for a portrait of natural size, the chemical substances forming the photograph are capable of affecting the durability and constitution of the colours forming the picture.

Considering all these difficulties, and while waiting in despair for the sun which was to enable me to produce enlarged photographs, it occurred to me that if I could supply the artist with a canvas upon which, while the image of the negative was thrown upon it by the light of the sun, and in its absence by the light of a gas-burner, I could trace every part of the picture with a black pencil, this would form for the painter a base even better than any photographic impression; and being supplied with such a perfect lightly-drawn portrait, and with a photograph for his guide, he would have all that is necessary for his work.

I have tried the experiment, and it has answered beyond my expectations. In the British department of Photography at the Industrial Exhibition may be seen several portraits as large as nature, which have been painted on canvas upon which a small negative had been enlarged by pencil-drawings. I have done it myself; and when I add that I am quite incapable of drawing, it must be acknowledged, from an inspection of the result, that being entirely due to the help of photography it is one of its most useful applications. The artists whom I have employed to paint these enlarged photographs have found them preferable to those produced by the chemical operation upon paper, because they have been able to lay their colours in all their brilliancy without being impeded by the dark shadows of the ordinary photographs.

As an example of the result, I call the attention of the meeting to a portrait of a boy painted in pastel, and to another of Professor Faraday painted in oil—both of which have been completed without sitting. Those to whom the features of the eminent Professor are familiar will be able to judge of the correctness of the likeness, and to appreciate this new mode of applying photography to the production of large portraits.

I have thought that this mode of forming the base for large portraits upon canvas—the usual and most suitable surface for the work of the painter—deserved the attention of photographers, who, to satisfy the want of the public, are obliged to employ artists to produce painted portraits. If it is found that this mode of operating is capable of results entirely satisfactory, and that it can be effected at any time when wanted, without the light of the sun, surely this must be considered as a great advantage in one of the most important applications of photography, which consists in furnishing the artists with a perfect base for painting portraits—having all the truth and character of painted photographs, and so easy to be obtained.

Having been the first to practise this process, the idea of which I have no doubt must have occurred to many others, and the productions having been received in the British department of Photography at the International Exhibition, I have considered it my duty to explain before this Society how these large portraits have been obtained, in order to prevent any misconception as regards their nature.

It is known in optics that when an image is considerably enlarged by a lens the centre only of that image is in correct proportion, because the screen being flat and the image being curved the parts thrown on the margin of the screen have a focus nearer than the screen, and, consequently, being represented on the screen at a farther distance, they are out of focus and enlarged. In order to obviate that defect the negative should present, alternately, all its various parts to the centre of the lens, and at every change, horizontally and vertically, a different image should be taken. Having taken the various parts forming the whole picture, and cutting them all in order to mount them in one picture, we obtain a representation without distortion. When we wish to draw the picture by hand, we have only to bring the various parts of the canvas in the place corresponding with the movements of the negatives, and we have a perfect picture of the whole.

This plan has another advantage: it enables us to enlarge a negative to a degree at which, by the limited centre of light of the condenser, it would be impossible to light the whole picture. The arrangements by which I move the negative vertically and horizontally will be better understood by the inspection of the apparatus and its action.

ON THE LIGHTING AND MANAGEMENT OF LIGHT IN PHOTOGRAPHIC GALLERIES.*

By Lachlan McLachlan.

The construction of galleries for the taking of portraits has never, in my humble opinion, received that attention which its great importance demands. Their present construction is to a great extent wrong, inasmuch as they do not answer the purpose for which they were originally intended, namely, the production of vigorous and truthful portraits, copies of statuary, &c., &c., at any hour of the day when there is sufficient light.

I may ask in what respect are galleries superior to the open air for the taking of portraits? They are superior in two respects:—First, they are not subservient to the weather; and, secondly, they give the light a certain direction according to the slope of the roof. But in every other respect they are much inferior to the open air. Why? Because we have to deal with the refraction caused by the glass and the reflection from everything in the room, which makes it very painful to the sitter, who is placed in the midst of a blaze of light. Yet there are many worse evils than these to contend with. The reflected light is scattered in every nook and crevice in the room. It enters the lens, pervading every shadow, reflecting from the background upon the sitter, and quite overpowering all that beautiful gradation of light that gives rotundity to the figure. The picture depends more upon the combination of light than it does upon the manipulation or chemicals; in fact, the light with ordinary care makes the picture, and good chemicals, lenses, &c., are nearly valueless unless the sitter be properly *illuminated*.

We have searched into the chemistry of photography, and we have greatly improved the apparatus used in the art; but it is a notable fact that the portrait gallery remains stationary, no improvement whatever having been effected in it. I have most unceasingly endeavoured to point out to many of my professional friends the great defects of most of the present structures.

The great error in their present construction is, that the balance of side and top light is seldom, if ever, taken into consideration. In the majority of galleries which I have seen, whatever amount of side or front light there was, the roofs had nearly the same inclination, just as if there were no side light. This I have proved to be a great error, and a greater detriment than may at first appear; for if we do not screen off a large portion of our side light, the picture is sure to be flat; for it is only by a certain amount of top and side light that we round the figure. It is a nice calculation to balance the one against the other: and ff we have too much of one or the other it is so much light thrown away.

I am willing to admit that under peculiar circumstances of light, chemicals, &c., results sometimes are obtained which seem to us nearly perfect; but how rarely is this the case! The exception is only found amongst a few professionals who have made the management of light their particular study. Under the present general system a perfect combination of light will perhaps be lost in an hour, or less. We have done nothing special to bring about this unity, and, as a consequence, we can do nothing to retain it—to avail ourselves of its effect. This should not be so.

I will now endeavour to describe the means which I employ to relieve myself and the sitter, at once, of the intolerable nuisance of an oppressive and unmanageable light. We will suppose a gallery faces the south. The plan I adopt to keep out the sun's rays, and to govern the light at pleasure, is this:—I take pieces of thin wood: place them hanging from the roof, in a south-west direction; but, before doing so, I obtain the highest altitude of the sun, and calculate the rake of roof, to ascertain the due distances to place them apart. Yet there is a simpler plan which can be adopted. First of all decide how deep you would like these pieces or strips: then fix two or three of them in their places, and as near as you think will do: then watch if they arrest the rays of the sun; if they do not, place them nearer together till the sun is excluded (I allude to the direct rays). Do the same to the front or side light, provided you have the sun there: you will then find that this method far surpasses the use of white blinds, brown paper, or other numerous contrivances—in fact, you will feel conscious of having overcome one of the greatest difficulties in your profession. If the sun cannot introduce itself directly it will do so indirectly, and, consequently, scatter its rays in every direction. This is undesirable: certainly it is an improvement, but not a remedy.

What we want is a concentration of light, with power to give it any direction at will. I have accomplished this by means of placing pieces of thin wood fixed in grooved rods, which rods are placed across the long blinds, so as to form compartments. These divisions are made to move at pleasure, which is easily done by connecting rods that may be made to move in sections, and to any required angle: by this method I have absolute control over the light.

The plan is the result of many years' constant study and observation; and, from the practical application of it, I am enabled to say that I can accomplish the results here stated. Of course judgment must guide us in the particular application of it, as well as in the working. For instance: when the light is focussed upon the sitter on a very bright day all the high lights are exaggerated. But the remedy is easy: by reversing the light the image will gradually change, and you may do so until you obtain an excess of half-tone if desired.

It is absolutely essential that we should have perfect command over the light in our art—as much, at least, as the painter possesses over his brilliant and well-mixed colours; and before we can rival the painter in perspective, we must be able to delineate or paint with the light, exactly as a studious and artistic painter does with his brush.

In order to claim for the photograph a place amongst works of art, we must be able to command at will as complete control over the background as we now can over the figure. Ask an artist to give you a delicate drawing of a statue upon a piece of soiled or smoked paper: he would naturally consider you a fool! And yet that is precisely what the photographer does. His back light is the smoke, and, until he can get rid of it, his pictures will appear as if they were sunk into what ought to be a background. In effect it is a palpable misnomer. Besides, it is lamentably deficient of the requisite light and shade which all artistic backgrounds ought to possess. Sometimes we see the light and shade (when there are any) quite reversed, thus clearly proving that the light is not under our control.

I will now endeavour to describe my plan of a background, which enables me to obtain any effect of light and shade I please, much easier than the painter can with his brush. I have four frames made exactly as the one you stretch your present material upon, with which you require two other frames, about twenty inches wide. These must each have a piece framed in the middle, with a slot about half an inch wide. Take and secure firmly two of your large frames to the edges of your two smaller ones, and you will have a skeleton box: place the third and fourth frames inside, allowing them to be moveable, with a handle or knob, which works in the slot of the narrow frames, by which means you will be able to fix the moveable frames in any position or angle you please between the others: cover the back-fixed frame with black velvet, and also the sides and top with the same material, to prevent the light entering from any source but the front. The two inner moveable frames must be covered with very open gauze or net. When you want to use this background, draw up and fix the front moveable frame forward to its full extent, and secure it there. The principle involved in the arrangement is this:—the back-ground is partially transparent, and allows the light striking upon it to pass through its meshes, so as to become absorbed by the black velvet at the back, and thus that halo is avoided which is so often seen around the margin of the figure, and which, perhaps, as much as anything else tends to flatten the picture and give it the appearance of having been taken separately and placed upon the background. The object of the front moveable frame is to allow us to remove it out of harm's way when done with. The front or outer frame might have been used for the front gauze screen, but it would continually be liable to injury. This skeleton box also serves to hold a series of landscape and interior backgrounds for *cartes de visite:* of course it must be understood that these views roll up to admit of the other frames passing. I may state that this *box* moves on castors.

With regard to the amateur's gallery, it is made exactly on the same plan, and at a great saving in cost, besides effecting portability and greater efficiency than if glass were used. Calico can be adopted with strings which are made to answer the place of rods. The whole may be fixed on four horizontal rods, and supported by four others fixed in the ground. The strips of calico can be made with eyelet holes in one end; the other end may have a piece of elastic webbing so as to stretch and keep it tight. The top ends must be fixed on hooks placed at the proper distances: the lower ends must be left loose, and a piece of tape or cord sewed to every one, so that when we pull the one end of the cords we can give the pieces of calico any angle we please. The same process can be applied to the sides or front. Now you have only to attach a piece of calico on one side of your tent, which is intended to shade the face of the sitter on one side. Without it the face would be quite flat. If the amateur

* Read at a meeting of the Manchester Photographic Society, May 7th, 1862.

select some shady nook for a background he will have a *gallery* very much superior to that of the professional.

In conclusion I may state that, having spent a considerable amount of time and money on this subject, I have thought it due to myself to patent the invention with a view to mere reimbursement; but I freely give it to all amateurs, and shall be happy to afford them any assistance they may require.

THE TANNIN PROCESS.*

By Major Russell.

[*By the special permission of the Author we reproduce the following.*]

CHAPTER VII.

A few remarks may here be made on the merits and demerits of some of the best known dry processes. The gelatine and meta-gelatine processes are simple, develop with great clearness, and can be made to give good results. The great objection to them is their strong tendency to blistering; this renders it difficult to prepare a collodion which will adhere sufficiently to the glass, will produce an uniform film free from mottled markings, and, at the same time, will give a tolerable degree of sensitiveness. Different proportions of ether and alcohol in the same collodion will produce blistering or mottling, and the latitude in this respect is so small that the same plate, if large, will sometimes produce blisters at the upper part from too much ether, and mottling at the lower corner from too little. Even if, by a method to be presently described, sufficient adhesion be secured to admit of the use of a sensitive collodion, the development is usually slow, and less range of tone is obtained than when the film is coated with tannin.

The collodio-albumen process will produce excellent results, with some degree of certainty; but involves great trouble, and is liable to the same objections as the gelatine process, though in a far less degree. Sensitiveness is much less affected by the use of a powdery collodion, and mottling of the film is not so apt to show in the picture, especially if thick albumen be used. Even in this process, however, a little too much ether added to the collodion, after evaporation by use, to prevent mottling, will sometimes cause blisters to appear when everything worked well previously. One of the greatest objections to the process is the difficulty of producing anything like a perfect coating of albumen, from the formation of gelatinous lumps and filaments in the liquid after filtration. The difficulty of filtering the albumen, if thick, and its tendency to form small bubbles, which adhere to the film with great tenacity, are also hindrances. These difficulties can be overcome by good manipulation; but the coating with albumen alone will, if carefully performed, take more time than the use of both gelatine and tannin in the tannin process.

Another objection to the collodio-albumen process is the liability of the surface of the albumen to contract stains from the nitrate bath. These may generally be avoided by using nothing in the albumen which will render it more absorbent, and drying the film strongly by artificial heat before the second excitement, although the development is thereby rendered slow and troublesome. If sugar, treacle, or nitrate of magnesia be used with the albumen the development is facilitated; but the liability to stains is, from the porous nature of the film, so greatly increased that in some states of the bath they can hardly be avoided. When any dry porous surface is immersed in the nitrate bath there must always be a chance of its contracting stains, and the liability will vary with the degree of porosity and the state of the bath. The tannin process gives better results with badly-lighted subjects than the collodio-albumen, and has other obvious advantages; nevertheless, it must be allowed that pictures produced by the collodio-albumen, in skilful hands, are of first-rate excellence, and time and experience only can decide between the two methods.

Fothergill's process is much simpler and less troublesome than the collodio-albumen, and is free from some of its faults. The difficulty of forming a good coat of albumen and of avoiding bubbles and filaments is got rid of, and a newer collodion may be used without producing blisters. On the other hand this process has defects of its own, one of which is an increased liability to stains. In the ordinary way of working Fothergill's process it is difficult to obtain great sensitiveness without approaching the limit at which these stains begin to show, from the contact of nitrate of silver and albumen upon the film. The process is also dependent to a very great degree on the quality of the collodion used, which, if unsuitable, renders the development very slow and feeble. Not only do the sky and high lights become pale from solarisation before the dark parts of the subject are sufficiently exposed, but the film is apt to be loosened in developing, and if so will never adhere again properly, or, worst of all, will split off in drying. All these faults appear to occur frequently with those kinds of collodion which gives the greatest sensitiveness. The tendency of the film to split off is so great on large plates that nothing but a very powdery and insensitive collodion can be used: varnishing round the edge will prevent the film from washing off, but not from loosening or splitting off when dried. If a preliminary coating be used, this process will give rather more trouble than the preparation by the tannin method, and will still leave the quality of the result dependent on the condition of the collodion, as before shown.

Negatives of the highest degree of excellence may be obtained by the albumen process with some kinds of subjects; but it is difficult to produce a perfect film, and to dry a layer of sufficient thickness, free from dust. Plates prepared by this process are insensitive, and appear to be quite incapable of taking sky and foliage or dark objects together, without rendering the former pale from solarisation.

Glycyrrhizine, used as a preservative on collodion, appears to be very uncertain in its effect. If the collodion be not in exactly the right state, even when a sample prepared for the purpose is used, the development is sometimes so feeble that scarcely anything can be brought out with any exposure.

After trying in vain to modify the collodion for dry processes in such a way as to overcome the difficulty of obtaining sufficient adhesion to the plate, without loss of sensitiveness, the writer thought of ascertaining the effect of an exciting bath, containing half its bulk or more of alcohol. This greatly diminished the difficulty, rendering the film very non-contractile (even when the collodion was new, and contained a large proportion of ether), and not diminishing the sensitiveness. For some time this answered well; but the alcoholic bath gradually acquired the property of dissolving iodide of silver, and in time this solvent power increased to such an extent as to render a collodion film transparent in a few minutes. Keeping a quantity of undissolved iodide of silver in the solution did not entirely prevent the destructive action, even when the iodide was stirred up, and the bath used in a turbid state. After being evaporated nearly to dryness, and re-diluted, the bath worked well again. Something like the above-described action, in a modified degree, often takes place in a bath which has acquired much alcohol from the collodion forming on the excited film streaks of less opacity in the direction of the dip. When this tendency has become so strong that it cannot be counteracted by moving the plate laterally immediately after immersion, the solution should be boiled in an open thin glass, or porcelain vessel, over a lamp, till most of the alcohol is driven off. The lamp should stand in a dish large enough to hold the nitrate solution, in case of accident. After being boiled, the bath can again be diluted with water to the proper strength.

It seems desirable in most, if not all, dry collodion processes to use some preliminary coating to secure adhesion, and thus to render us independent of the exact mechanical state of the collodion. Several such coatings have been proposed. India-rubber, dissolved in benzole, answers the purpose so far that it usually prevents blistering and loosening from the glass; but, unfortunately, as soon as the finished and dried negative is warmed for varnishing, the film often splits in cracks all over, without being detached from the plate: this is probably the effect of unequal contraction. Wax, dissolved with the India-rubber, tends to prevent the liability to split, but produces a dull, granulated surface; and some of the wax is dissolved by the ether in the collodion, producing in the latter, if present in any considerable quantity, a tendency to gelatinise on the plate from precipitation of the wax by evaporation of ether: this state of things gives rise to a mottled texture. Marine glue dissolved in benzole, in which it is very sparingly soluble, is even more addicted to cracking than India-rubber. Albumen is sometimes used for this purpose, but, in its ordinary state, is not to be recommended; for not only does the first contact of the collodion render it permanently insoluble and incapable of afterwards swelling, like gelatine, into the pores of the collodion, but it is too close in texture for the collodion to penetrate, and the adhesion of the latter is therefore imperfect. Albumen has also a far more injurious effect on the bath than gelatine, and it can be easily proved that the nitrate solution penetrates beneath the collodion by coating a glass with meta-gelatine (which is readily soluble in cold water), drying, covering with collodion, and dipping in the exciting bath, when, in a short time, the solution of the meta-gelatine will be made evident by the loosening of the film. Again, the effect of the albumen, acted on by nitrate of silver, is likely to be prejudicial to the picture; for the same soluble matter which injures the bath will, if any of it

remain in the film, cause rapid deterioration by keeping, liability to fogging, and a muddy, yellow tone in the negative. The above-named matter shows its presence in imperfectly-washed collodio-albumen plates, but is more easily removed from a film of coagulated albumen on the surface than from one below the collodion.

The following is the method of using albumen referred to in Chapter II.:—Beat up one ounce of albumen with 30 grains of nitrate of magnesia, or, should this not be at hand in the dry state, 30 minims of strong nitric acid, accurately neutralised with magnesia or carbonate of magnesia; dilute with 3 to 5 ounces of water, and filter. The nitrate of magnesia is not necessary, but appears to facilitate the coagulation of the albumen, and to render its adhesion more perfect both to the glass and to the collodion, particularly to the latter, by making the surface more porous (though the washing alone, after coagulation, will secure this to a great extent). Coat the glasses and dry exactly as described in the case of gelatine. When the plates have been dried for a short time, at a heat of 100° to 120° (a little hotter than the hand), plunge them, still warm, into a dipping bath, containing 30 grains of iodide of cadmium to each ounce of water and as much iodine as will dissolve. After about one minute remove from the bath, wash under a tap, soak in a dish of water till most of the colour has disappeared, wash again under a tap, dry by heat, which will remove any iodine not washed out, and keep and use exactly as in the parallel case of gelatine. The albumen solution will keep any length of time, if a few drops of oil of lemon peel (essence of lemons) be dropped into it, and will be found to improve by age. The iodide solution simply requires filling up as it wastes by use, but should be kept in a bottle, to prevent evaporation of the iodine. The albumen film, prepared as above, will enable us to use a new and horny collodion for any dry process, and the albumen appears to be without effect on nitrate of silver, consequently no fear need be entertained of its injuring the bath. Gelatine, however, answers so well when tannin is used, that it is questionable whether it is worth while to adopt a method involving so much additional trouble. The only fault which can be found with the coagulated albumen film, beyond the trouble of preparing, is the difficulty of removing it when the glasses are cleaned after taking negatives: carbonate of soda acts but slowly, even when used in strong warm solution.

Gelatine may be used instead of albumen as a preliminary coating for other dry processes, and will answer tolerably well with some kinds of collodion. With other kinds, however, it is not to be depended on, as it is liable to be dissolved or softened too much in the different washings, or during development, unless this be prevented by the coagulating effect of tannin.

A thin film of gelatine, dried and rendered insoluble in a strong solution of tannin, may be used with success in many dry processes; but this method is as troublesome as that already described with albumen, and is likely to injure the bath by the introduction of a trace of tannin.

It was during his experiments with gelatine, as a preliminary coating, that the writer, about a year ago, first thought of trying the effect of tannin on dry collodion. Having for years been in the habit of using gallic acid with all dry processes, either mixed with the preservative solution or as a final wash, to facilitate the development and increase the brightness of the picture, and render it less liable to solarisation, it struck him that tannin, a body of somewhat similar nature, might answer the same purpose. It was accordingly substituted for gallic acid, in a solution of gum arabic—at first in small proportion. This experiment proving successful, the tannin was afterwards used in the same way in larger and larger proportions, with the effect of still further improving the negatives. Eventually the tannin solution was employed alone, and apparently with advantage; for although gum arabic, mixed with tannin solution, gives a little more sensitiveness to the dark parts of a feebly-lighted subject, there is always a greater tendency to fogging, particularly when the picture contains much sky, or strongly-lighted objects. Citric acid in the solution corrects this tendency, but probably destroys any extra sensitiveness otherwise obtainable.

Gum arabic used alone produces less tendency to blistering than metagelatine, but more than tannin; and its partial substitution for, or addition to, tannin solution, gives a slight tendency to blistering or loosening of the film, even when gelatine has been used as a previous coating. Again, the gum, unless throughly washed out, renders the developer turbid in cases were tannin would have no such effect, and solution of gum does not filter so easily as that of tannin. Hence, on the whole, it seems better to use the latter alone, as it fulfils every requirement, acting mechanically in keeping open the pores of the collodion, and giving, perhaps more effectively than any other known substance, that organic reaction without which a sensitive collodion cannot be worked when freed from nitrate of silver and dried. If 30 grains of tannin to the ounce be used, the film will be restored to a very porous condition when moistened previous to development, as will be shown by its whitening; and the development will then be very rapid and energetic. The action of tannin in stimulating the development is most remarkable, being much greater than that of gallic or pyrogallic acid used in the same way, although the first-mentioned substance is a far feebler reducing agent than either of the others; indeed, tannin has scarcely any developing power, even when mixed in strong solution with a large proportion of nitrate of silver, and if applied to a plate fully exposed in the camera it will only bring out the sky faintly in an hour or so. The properties of tannin and gallic acid differ also in another respect: if we increase the strength of tannin solution on new and sensitive collodion, it will give increased vigour and intensity from 1 grain to 30 grains to the ounce of water; whilst gallic acid acts very differently, showing a kind of alternating action. This is not seen on applying the solution of different degrees of strength up to saturated solution in cold water to collodio-albumen plates, either because the greatest strength does not go beyond the limit of greatest intensity, or because the film does not retain enough gallic acid to pass that limit, the remainder crystallising out. If, however, we dissolve gallic acid in the proportions of 1, 2, 3, and 4 grains to the ounce in different portions of a solution of metagelatine containing alcohol, and coat with these four excited and washed collodion plates, we shall find, on development after similar exposure, that within these limits the increase of gallic acid first promotes and then diminishes intensity. Again, this alternating action may be shown in the following manner:—Excite a piece of iodised Talbotype paper, remove the nitrate by washing well in common water, dry, and fold in three equal parts; float the middle part on saturated solution of gallic acid in cold water, then immerse the part at one end in the same, and hang, till throughly dry, with that end downwards which is wet on both sides, expose in the camera and develop: the middle part will be found to be far more intense than either end. The same alternating action shows its effects, when plates prepared with gallic acid are dried by artificial heat, by the unequal intensity produced. If the strength of the gallic acid solution be that most favourable to intensity, any concentration by evaporation and heat will produce faintness in the developed image: this effect will be seen in the parts which were the last to dry. If the same alternating action be possessed at all by tannin, the limit of greatest intensity is not at any rate soon reached. The writer can at present form no hypothesis to account for these phenomena. Perhaps a careful comparison of the action of pyrogallic acid with that of gallic acid and of tannin, in solutions of different strengths, might throw more light on the subject.

RULE FOR FINDING AT ONCE BOTH THE DISTANCES OF NEGATIVE AND SENSITIVE SURFACE FOR ANY DEGREE OF ENLARGEMENT, AND VICE VERSA.*

By M. Claudet, F.R.S.

In a former paper, which was published in the number of the *Journal of the Photographic Society* for March, 1861, I have given a new theory for the measurement of the focal distances on one side of the lens, and the distances of the object on the other side. I have explained why both these distances must be measured, not from the surface of the lens, but from a point before it, which is the nearest distance at which an object may be placed for producing the largest image possible, and another behind, which is exactly the focus for parallel rays giving an image as small as possible. The space between these points and both sides of the lens is a nonentity, being in fact nothing more than the thickness of the partition dividing the two sides of the camera-obscura without lens.

These two points are the zero of the scales of measurement for the focal distance and distance of object. When these two points have been determined, if we find two other points at which the object must be placed before the lens to produce behind it an image of the same size, these two points form the other extremity of the scale, and that scale is the unity which serves for measuring all the distances and determining exactly the proportion between the size of the object and that of the image.

To facilitate all the calculations these scales are divided in one hundred equal parts.

When we want to have an image of the same size as the object, we have only to place both the object and the screen on the 100th

* Read at a meeting of the London Photographic Society, June 3, 1862.

division of each scale. For an image double the size of the object we place the object on the half of the scale precisely on the division 50, and the screen destined to receive the image at a distance equal to two unities, or to $\frac{200}{100}$ divisions. For an image half the size of the object we reverse the proportionate distances.

If we want to enlarge the object 100 times we place it on the division 1 of the scale, and the image will be at a distance equal to 100 times the unity.

All intermediate distances and proportions are calculated and fixed in the same manner.

Let us suppose that we have a portrait on a negative which is twenty times smaller than the natural size, and we want to enlarge the image to its natural size. We have only to place the negative on the 5th division of the scale, and the sensitive surface for the image at a focal distance equal to twenty times the unity.

If we wish to enlarge the same negative only five times we place it at once on the 20th division of the scale, and the screen for the image exactly at a distance equal to five unities.

These few examples will be sufficient to show how all the calculations can be effected by means, firstly, of a scale marked with all its divisions fixed on the table containing the camera, and, secondly, by means of a tape long enough to extend to twenty-five or thirty unities, and marked all over its length with these unities and subdivisions.

The scale fixed in the camera contains on each of its 100 divisions the number indicating the corresponding distance of the screen, and the tape upon which all the distances of the screen are marked indicates also the corresponding divisions of the scale fixed in the camera; so that if the two measures have been once for all correctly constructed, it is no more necessary to examine on the screen if the image is in good focus: it must necessarily be so, and that will save an immense amount of trouble and all possible errors.

I think that nothing is more interesting than to examine and study the law by which these scales of measure are regulated. We can see the curious progression of foci, which increases and diminishes exactly in the same proportion as the distance diminishes and increases. The two quantities, whatever they are, being multiplied one by the other, must have for product the unity forming the scale; and if that unity is divided in 100 parts, the product must be equal to 100—so that, knowing any distance either of the image or of the object, we have only to divide 100 by the quantity known and the quotient is the other. For example: if the distance of the image is found by the tape to be 17·67, we have only to divide 100 by 17·67, and we have 5·66 for the distance of the object.

STEREOGRAPHS.

"The Attractions of a Country Fair."

Photographed by VALENTINE BLANCHARD.

Published by C. E. Elliott, 5, Aldermanbury Postern, London.

WE have seldom experienced more pleasure in the examination of stereographic productions than we have enjoyed with the series now before us, which, in the vernacular of the day, may be appropriately designated a "sensation" series. These productions—recording a phase of country life, albeit familiar enough in our boyish days, now fast passing away—are as novel as they are excellent, and manifestly testify to the skill and perseverance of the photographer, whom we are informed took the negatives during some of the cold days of last March. This is the more satisfactory, as the possibility of delineating crowds of people, in all the excitement of a fair, by instantaneous exposure, surrounded by somewhat unfavourable circumstances, is now placed beyond a doubt. These are no mere black patches of outline, like those which are sometimes shown as "instantaneous" pictures, but quite intense enough and full of detail and half-tone. They are not only good for instantaneous pictures, but good unreservedly. We do not affirm them to be perfect, for some few of the figures show movement during the exposure, rapid as it must have been; but good they certainly are—very good—and full of interest.

The first we shall notice is called

GOING TO THE FAIR, No. 133, and represents one of the streets in Wisbeach, Cambridgeshire—evidently a main thoroughfare; and near to the footway are numerous open stalls belonging to the vendors of "apples, oranges, spiced-nuts, ginger beer," and other comestibles obtainable at such places. In the centre of the street is a row of booths and shows, while crowds of people, young and old, males and females, throng the intervening spaces. The countenances of some are very amusing, and they would certainly be recognisable by their friends. A few have evidently noticed that a photographer is at work, and are watching his operations: among the last are a policeman and one of the stall-keepers.

WINN'S TRAVELLING THEATRE, No. 137, introduces us to the best part of such an establishment—we mean the platform outside—where all the performers in the play and the afterpiece are congregated together in picturesque confusion—the chief tragedian, the "funny man," the *danseuse*, the pert *soubrette*, the high priestess of Thalia, a couple of little girls, and the clown. The artistic (!) background is adorned with numerous striking scenes, supposed to be illustrative of the "play," and on the left is a side-door open, and showing its construction to be but a light frame of wood covered with canvas: it is kept open by a couple of halberts leaning against it, and several people, evidently part of the audience, are entering to take their places, in order to witness the entertainment. In this slide only a few of the outside spectators are included, but several of the faces amongst them are visible.

THE CLOWN'S ADDRESS, No. 136, is another view of the same "theatre" from a different point, and including many spectators. In the foreground there is quite a small sea of heads, all turned towards the clown, who stands at the head of the gangway, in the act of addressing the owners of the said heads, while pantaloon looks on. Evidently the address is an eloquent one, for it is noticeable in this slide that not a single face from amongst the spectators is turned towards the photographer.

THE FEMALE BLONDIN'S TRAVELLING CIRCUS, Nos. 134 and 135, are two entirely different views of the same subject from opposite directions. The platform, with its background of paintings—in this case representing impossible feats of equitation and gymnastics—is occupied by the members of the company, including the female Blondin herself, a smartish-looking young woman in a white wreath and uncommonly short petticoats, surrounded by several acrobats, including a little girl and two boys, one a mere infant. Several musicians occupy the farther corner behind a huge placard, on which we can distinctly trace the words "FEMALE BLONDEN" at the top and "laughable farce" at the bottom. The heads of the spectators of this show are covered principally with little round hats, indicative of female heads beneath. In No. 135 the male part of "the company" on the platform forms a majority, and the "bit of a boy" is seated on the learned pony. Here a placard announces "Admission to the Performances one ——?"—the hiatus being caused by the obtrusiveness of a big drum. A man in plain clothes is standing at the lower end of the sloping gangway, with arm extended, addressing the spectators.

It must not be forgotten that these views are no mere transcripts of "scenery, machinery, dresses, and decorations" (as they say in the play-bills), got up for the occasion, but are the veritable presentments of actual events.

It needs but little of the skill of "second sight" to predict that these productions will be amongst the most popular that have yet been published; and we can honestly assert that, as a skilful manipulator, Mr. Blanchard has added another leaf to his well-earned wreath of laurels.

Exhibition Gossip.

IN THE BRITISH DEPARTMENT.—PORTRAITURE

(Continued).

HERE is a change! The shilling admissions have commenced. The day of our visit is Whit Monday, and, behold! here is even the once lonely and deserted hiding-place of British photography full—absolutely full—of evidently gratified and interested visitors. You may say it does not take many to fill it, which is very true; but if you had been up here time after time and found it a lifeless solitude at each of your dreary visits, you would think with me that its present busy, bustling aspect is quite a cheering sight. The cameras, the lenses, the pictures—all have their little groups of talkative admirers, and the stereoscopes are in a perfect state of siege. I really think if I had now to speak of those "backgrounds" on the staircase I should do so in a more lenient and charitable spirit, so genial a change does this make in one's feelings.* How far the alteration in the room's aspect may be due to the fact that two large notices—one over the homely entrance, and one running up over the stairs—now announce the whereabouts of this department in bold white letters on a bright red ground, I know not.

* It may be urged, perhaps, that, for a reason to be found in the advertising columns of this Journal, I should have passed over these profile and background accessories without notice, were it not that by so doing I should have omitted a portion of that duty which I undertook in writing these papers—a duty which, in my last, I promised to fulfil despite all possible chances of misrepresentation and detraction. Let me be judged in all matters simply by the character of my assertions. If my statements are palpably true, whether they emanate from me, or from any one else, is a matter of small moment; while, if they are false, they show blacker against me, from the very circumstance I have just alluded to, than they possibly could against anyone else. Meaning no wrong I fear no ill, *Absit invidia.*—A. H. W.

Another change, which is infinitely less gratifying, makes itself felt when we look round at the pictures. The dangerous foe of the picture-gallery—the enemy from which the exquisite water-colour drawings of Turner, Hunt, and other great English masters were so quickly, and we must hope effectually, rescued by a timely, but not by any means too prompt an application of American cloth to their backs—in short, *damp* has got to the photographs, and here revels unchecked in its malignant influence. The charming little tinted vignettes of T. R. Williams are disfigured and defaced past recognition. That this gentleman's colourist imprudently and somewhat liberally used a non-permanent white in tinting these beautiful productions is now made apparent by the black patches and marks which have taken the place of high lights in the faces and on the white drapery. The same may be said of pictures tinted very similarly in water-colours, and exhibited by Mr. Kilburn. Many other water-colour pictures palpably exhibit, although in a slighter degree, signs of the same destructive influence—those paintings which have least body-colour in their composition being least injured. Nor is the change thus effected in many of the uncoloured photographs less melancholy. Rusty spots and yellow stains are breaking out over the surface of many; while whites which, at our last visit, were pure and clean, are now rapidly assuming the autumnal yellow of declining days. The tinted pictures of Messrs. Kilburn and Williams are "past praying for," being utterly ruined and spoilt; but luckier exhibitors should adopt some of the usual remedies without loss of time.

There is yet another change to be noticed in reference to this department. An improved and more complete edition of the catalogue has been published, to which has been very judiciously added some brief notice of the art as it was in 1851 and as it is in 1862. The progress made in these eleven years is very gratifying and very wonderful.

As we have been dwelling upon the *greatest* novelty at some length, we must now quit the large portraits and discuss portraiture as a whole; for if we give too much time and attention to one branch of the art, others will most certainly lack as much of both as they deserve.

In this—the British department—Mr. T. R. Williams stands foremost as a portraitist. His pictures are distinguished by nearly all the best qualities of the best photographic portraits; and, for their rendering of the texture and character of flesh, they are as nearly perfect as anything I know. The exposure is, undoubtedly, the great secret of successfully rendering texture. A second more or less is thought by inartistic operators to be a trivial matter; but my own observation and experience confirm the opinion I express in saying that too much care and nicety of judgment cannot be exercised in regulating the exposure in the camera if the artist's great pictorial quality, texture, be sought or desired. I have, for instance, seen my plate at one stage of the development exhibit a negative which would give all the softness, semi-transparency, and general characteristics of flesh very correctly; but then parts in deep shadow have been without detail, and I must have either left them in this unsatisfactory condition or, by pushing the development further, seen the fleshiness of the face and hands gradually fading away. Take a portrait of Mr. Hardwich, which Mr. Williams exhibits with several others on one of the screens, and compare the flesh of this with that of other portraits in the room, and I am sure you will agree with me in asserting that none can compete with this and similar pictures in the expression of that soft, semi-opaque, luminous character peculiar to flesh. In many of the pictures what should be flesh looks hard, rigid, metallic, and opaque. You could never imagine the living blood being seen below its outer surface, or fancy the subtle play of the muscles beneath its downy covering as you readily can in such exquisitely-finished productions as those of the quite unrivalled Mr. Williams. There is an occasional want of good composition, however, in the arrangement of Mr. Williams's figures and tasteful (not profile) accessories which I here venture to point out, although they are so fine and rare as examples of pictorial texture and finish. Such faults can only arise from wanting a better appreciation of the few and simple rules by which composition is governed, and which may be so very easily acquired that the seeming want thereof has but small excuse in one so able and so tasteful.

There is a large display of the fashionable card or album portraits. Among the best are those sent by Kilburn—among the very worst those exhibited by L. Birnstingl; and these are so bad that their admittance into such a collection must be very universally condemned. Some are full of spots and stains—others are frightfully under-exposed, many over-exposed, all are ill posed; and either the guarantors of the Exhibition, whose portraits these are said to be, are, on the whole, a very vulgar and un-gentlemanly-looking class of people, or the pictures (?) of L. Birnstingl have slandered and maligned their general appearance after a very gross and unjustifiable fashion. One might easily imagine these two frames of dingy, out-of-sharp, ill-lighted, badly-developed card-portraits had been taken bodily from the door-posts of some cheapest photographer of the least aristocratic thoroughfare, and borne by flying mischievous *Pucks* to the screen on which they now hang, in despite of some astonished "touter," or, as the cant phrase has it, "barker," and to the great horror of all good and respectable photographers. Although not altogether good as photographs, a very picturesque collection is formed by Ross and Thompson's card-portraits of children. *Young Lochinvar*—a chubby little boy, mounted on a rampant rocking horse, with a dimpled little laughing-faced girl behind him, seated on the fiery charger, and twining her chubby arms prettily round the gallant young chieftain's neck and waist—is particularly good. Other similar ideas are equally humorous and amusing, and will win for the playful fancies of Messrs. Ross and Thompson golden opinions, and, doubtless, plenty of work in this particular direction, which is not altogether easy work either. In the pictures of children especially, however, we want more refinement of *chiaroscuro*, and greater delicacy and lightness in the general effect: these seem to have been commonly under-exposed, and have, consequently, a slight tendency to hardness and patchiness, with, from the same cause, a lack of transparency or detail in the darker shadows. The backgrounds might be less sombre and heavy with advantage to the pictures. These gentlemen also exhibit some bold and forcible studies of expression which are very successful, although, like the card-pictures, they bear signs of being rather under-exposed. The card-portraits of Maull and Polyblank are very commonplace; those of Mr. H. N. King are not quite so good, perhaps; others by Mayland, of Cambridge, are very good indeed; and some by Beard, of King William Street, only require a little more softness to be their equals.

Coloured portraiture is very strong in its muster, and the specimens thereof are chiefly exhibited by our London establishments. Among the very best are the pictures coloured in oil, exhibited by Mr. Kilburn, which have all the characteristics of first-class paintings, with neither the tea-boardy kind of smoothness and polish which deform some of the works in their immediate vicinity, nor the thin, timid, ineffective glazings and chalky lifelessness which characterise others not far from them. The masterly touches and the bold, firm method of execution displayed in some of these portraits is quite refreshing after the morbid conventional colouring and the wavering uncertain mode of handling, or ignorantly-confident presumption of touch, which we are only too much accustomed to see associated with coloured photographs. Among the worst of the painted specimens are the hard, staring, and metallic productions contributed by Beard, and the tawdry, theatrical, French conventionalities of Mayer Brothers, of Regent Street. Heath and Beau, although rather crude and gaudy in their combinations of colour, exhibit some very good miniatures. Locke and Whitfield's (old friends all) are very fine, although every picture is spoilt by the eyes being so peculiarly enlarged that they produce an effect the very reverse of natural or beautiful. No. 829, by T. R. Williams, is very charmingly coloured. Kilburn's demi-tinted pictures in water-colours were very neatly executed, and looked so until the damp destroyed them; and some vignettes, by Williams, seemed tinted with careful delicacy and much prettiness of effect until the same active agency ruined and destroyed them also. Mr. Sutton (Regent Street,) exhibits some rather prettily-tinted little miniatures: neatness and quietude being their best qualities. Mr. Green has some very life-like and artistically-executed pictures, painted somewhat roughly, but which are very fine nevertheless, if not the finest here. You must not examine these with a microscope; but then there is no particular reason why you should do so. Kilburn's water-colour pictures are decidedly inferior to those in oil. Here, however, I must again bring these gossiping criticisms and descriptions to a close, lest they grow wearying, as such things may when unduly prolonged.

A. H. W.

BRITISH PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION.

[We extract the following from the Official Catalogue of the photographs exhibited in the British Department, as affording the best official information obtainable relative to the collection.—Ed.]

"In the Great Exhibition of 1851 photography had not sufficiently advanced to be placed in a separate class: photographs, and the apparatus used in producing them, were included among philosophical instruments,

It has now a class of itself (XIV). The art was, in 1851, represented by a large number of Daguerreotypes, some Talbotypes, or sun pictures, as they were then frequently termed, and by a few specimens of the albumen process on glass. The collodion process, to which is due the enormous development which has taken place since 1851, was not known previously to the opening of the Exhibition in that year. Photographers were anxiously looking for some material which should be free from the defects of the paper on which the Talbotype negatives were taken. Albumen on glass had been tried with some success. Archer turned his attention to the use of a film of collodion, and was experimenting upon it previous to the opening of the Exhibition; and Dr. Diamond, in company with him, took a portrait with some collodion given him by that gentleman, as early as September, 1850. A collodion portrait, taken by Mr. Archer, assisted by Messrs. Fry and Horne, early in May, 1851, and what is termed a positive picture,* was placed in Messrs. Horne and Thornthwaite's case in the Exhibition, with their Daguerreotype and Talbotype apparatus. Towards the end of June in that year Mr. Rippingham, by permission, placed in this case some prints from negative collodion plates, the collodion for the purpose having been given him by Mr. Archer. The description of the process was published by Archer, in March, 1851, when it appeared in *The Chemist*. In the jury report no other notice is taken of these pictures than that "Rippingham has exhibited several Talbotypes, being a series of untouched positives from collodion negatives on plate-glass." No medal was given—indeed no one could have then foreseen the influence which these experiments were to exercise on the photographic art—and the jury may well be pardoned for passing them over. In a short time, however, the simplicity of the process and the beauty of the results caused its almost universal adoption, though numerous improvements had, in the meantime, been made in the negative paper processes, more especially that known as the wax-paper process, invented by Le Gray.

The photographs in the present collection are, with some few exceptions, all produced by the collodion process. The exceptions are noted in the catalogue, and they consist of a few Daguerreotypes (Nos. 900 to 905), views of the International Exhibition of 1851, Talbotypes (Nos. 101, 423, 436 to 444), pictures from albumen negatives on glass (Nos. 7,8, 9, 10, 101), and from wax-paper negatives (Nos. 134, 174*, 180, 181, 184 to 195, 199, 200, 203 to 206, 564 to 566), the others being modifications of the collodion process, known as dry or preservative processes, the object being to set the operator free from the encumbrance of tents or other contrivances necessary when working with collodion away from home. Nos. 16*, 29, 88, 91, 103, 104, 105, 113 to 118, 124 to 126, 133, 139, 143 to 145, 296, 297, 308, 333, 347, 369, 388, 390, 428, 461, 465, 479, 480, 502*, 651, 652, 688, 705 to 707, 725, 729 to 731, 746 to 749, 751 to 753, refer to specimens produced by such processes.

The early positive prints on paper were produced by the nitrate of silver process, still in use, but were untoned and of a reddish colour, and were liable to fade. The toning process first adopted gave more agreeable tints to the pictures, but rendered them even more liable to fade than before, though, with very careful manipulation and good washing, there are pictures which, under favourable conditions, have resisted change. Photographers and chemists have endeavoured to investigate the causes of this change, and the alkaline gold toning process now in use produces pictures which, if not absolutely permanent under every possible condition, are, with ordinary care, sufficiently so for all practical purposes. Many experiments have been made to use other materials for printing than nitrate of silver. A series of such experiments is shown in Nos. 778 to 783, 785 to 788, and 794 to 797. The silver process, however, is that universally adopted by photographers. Many attempts have been made, with more or less success, to print from the negative in carbon, the basis of printer's ink, or other indestructible materials, and thus give the photograph the permanence of a print from an engraved plate. This has been sought to be accomplished either by producing photographically an engraved metal plate or prepared lithographic stone, from which prints may be taken in the ordinary way with printer's ink, or by so treating the paper chemically that when submitted to the action of light under a positive or negative print, as the case may be, carbon or some other finely-divided material shall adhere only where required to form the picture. Fox Talbot shows photographic etchings, both on copper and steel, entirely produced by photography and etching, but untouched by the graver (Nos. 507 to 532). Paul Pretsch calls to the aid of photography the electrotype process, and shows specimens obtained by these processes combined. He produces not only the engraved plate, but also blocks for surface printing, capable of being used with letterpress; his specimens are numbered 39 to 42, 45 to 48, 161, 162, 505, 506, and 539 to 544.† Sir Henry James, the Director-General of the Ordnance Survey, also shows a process which he terms photozincography, by which the photograph becomes transferred to a zinc plate, and can thus be multiplied in printing ink. This process is used by the Government in the Ordnance Survey for the production of maps, plans, &c., enlarged or reduced in the camera, and great economy both in time and money is effected by it. Specimens of it, including a modification termed photopapyrography, as well as of photolithography, and showing its adaptation to the reproduction of engravings, printed matter, and MSS., whether old or modern, are seen in Nos. 69 to 77. Pouncy (No. 44), Cecil Walker and Son (No. 547), and Joubert (on the table at the east end of room, under the name of "phototypes"), exhibit specimens of direct printing in carbon from the photograph, without the intervention of any metallic plate or stone. The basis of all these processes is the peculiar action which light causes upon a mixture of gelatine and bichromate of potash. Contencin (No. 62), Field (78), and Ramage (504), show specimens of photolithography, the image being impressed photographically on the stone. Field's process is based on the special action of light on a surface of bitumen of Judea covering the stone, an action investigated in the early days of photography by Daguerre, who subsequently abandoned it for that process which now goes by his name.

The printing of positive transparent pictures on glass was, for a long time, exclusively practised in France: it is now done in England, and specimens are shown on the tables of Mr. Breeze and of Messrs. Negretti and Zambra. A statue in one of Mr. Breeze's pictures is taken by moonlight. Mr. Joubert, on a table at the east end of the room, shows specimens of photographs in vitrifiable colours burnt in on glass, both monochrome and polychrome. Microscopic photography, *i.e.*, microscopic objects enlarged, is shown by Nos. 545, 546, and 548 to 563; whilst Nos. 17, 18, 22*, and 927, refer to microscopic photographs, or photographs which require the aid of the microscope to inspect them. Enlargements by the solar camera are represented in Nos. 166, 277, 278, 282, 283, 288, 294, 295, 645, 646, 650, 657, and 658; whilst Warner (102, 106, 123, and 127) shows architectural and other views printed from enlarged negatives.

On the south wall, and on tables, are exhibited the painted and coloured photographs and stereoscopic Daguerreotypes.

* Very few pictures of this character are shown in the present Exhibition, though the process is that by which the cheap portraits, so common now-a-days, are taken. Some may be seen in frame No. 43.

† Some of these are entirely untouched with the graver, and some have been so assisted. They are distinguished by labels on the specimens.

Exhibition.

EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.

ALTHOUGH not a very large collection, that of the above Society at the Crystal Palace is, at least, a very satisfactory one. Nearly every branch of the art has its able representatives, both as regards its productions and its processes; and, although many very desirable names are absent from the catalogue whose pictures would have been very valuable to the effect of the whole, on the other hand, many are there whose presence in our photographic exhibitions we have not before had the pleasure of greeting. We doubt not that, as a very attractive addition to the many attractions in science, art, and industry contained in the beautiful Palace at Sydenham, this Photographic Exhibition will be largely appreciated.

Some of the works exhibited have already been censured and praised, defended and criticised, in our own and in contemporary pages; of these, therefore, we shall say nothing, unless the little we can add to what has already been said chance to be more or less original. The catalogue shows us between sixty and seventy exhibitors of somewhere about five hundred specimens. A large number of these are reproductions from paintings and engravings, contributed chiefly by Mr. Henry Hering, of Regent Street, who, with another enterprising photographic publisher, Mr. Gladwell, of Gracechurch Street, contributes a larger number of specimens than have been received from any other individual exhibitors. The pictures of the latter gentleman are very remarkable, and will excite no small interest in very varied classes of spectators. Many of the former's copies are from indifferent prints, which have already had their little day, and are not of sufficient artistic merit in themselves to render their reproduction and perpetuation by photography a matter of any great interest or particular desire, although others are from choice copies of first-class engravings, rare and valuable in themselves, and nearly all are extremely fine as examples of photographic reproduction, being sharp, crisp, brilliant, and clean, with the more delicate tints and lines well preserved, and the deeper and more forcible passages given with all the intensity and vigour of the very best and earliest proofs from the original plates.

Among the reproductions, which are the first things to greet us on commencing our inspection, we find a very interesting one in No. 16, *A Page from an Early Newspaper* (date 1759), exhibited by F. Newberry and Sons, and containing the advertisement of the well-known Dr. James's powders. W. Jeffreys (Nos. 24 to 26) exhibits some very interesting reproductions of etchings by Albert Durer, and one of a sketch by Turner, the same of which Mr. Ruskin gives a partial copy in his *Elements of Drawing* to illustrate the increased effect gained in expressing character by judiciously adopting the laws of pictorial composition. Some poor, weak, woolly-looking specimens of reproductions, by Mr. T. Gregory,

prove that, for copying prints, the waxed-paper process is not exactly the right thing in the right place.

The next screens introduce us to portraiture. Some large portraits by Mr. C. T. Newcombe (the same as this gentleman exhibits in the International photographic garret), taken direct, are very bold, round, and vigorous, but lean rather towards the coarse and hard. This is more observable in the portrait of that very charming actress, Miss Sims, than in the picture of Messrs. Toole and Bedford, the comedians: the former, we should think, was a little spoilt in the printing.

Mr. Wright, who exhibits some rather inferior specimens of commonplace portraiture, and some very poor attempts at grouping and composition, and which, moreover, have been exhibited more than once or twice at other exhibitions, or we are very much mistaken, ostentatiously parades himself as being both artist and photographer. A contemporary once remarked of this same gentleman that he had much to learn in both art and photography, and we are of precisely the same opinion.

Some *carte de visite* pictures by Messrs. Maull and Polyblank are certainly not the kind of productions we ought to expect from so old and flourishing a photographic firm. Excelling in no one photographic or artistic quality—many of them awkwardly posed, few of them sharp, and none of them either delicate or forcible—little can be said of these save that they are anything but the photographs we ought to expect from such a source.

Some card portraits, by Mr. Wall, are wanting in brilliancy and roundness, and have a little too sombre and heavy an effect for pictures of such a size and character; but the vignetted heads are very soft and delicate, and one picture of a mother bending over a little toddling child, indicating an almost instantaneous exposure, is very successful. The best card-portraits on this screen are those by Mr. C. T. Newcombe, and they are, undoubtedly, very excellent specimens. In these little pictures there are no such staring monstrosities as deform the stages of booths at country fairs, and may degrade photographic portraiture to a very similar level. The accessories are, like the portrait, *real*, and could never be mistaken for anything at all resembling the flat profile "set pieces" of the theatre: the backgrounds—generally plain, or nearly so—are neither cut up with staring lines of pure black and unqualified white, nor rendered painfully prominent by representing a mass of incongruous objects crowded into a small space, which the figure itself should have no difficulty in filling if well photographed and artistically posed. As a protest against the too commonly adopted abuses we have ventured above to denounce, Mr. Newcombe's capital pictures, like those of nearly all our *best* and most tasteful portraitists, are refreshingly welcome.

As an example of the reverse side of the question there is No. 35, a large frame of card-pictures by Messrs. Bullock and Co., of Leamington, in which, with photography by no means bad, we have in combination, one or two of the most comical attempts at pictorial background painting we have yet seen. These backgrounds are like nothing so much as the curly, well-gummed, much elaborated landscapes sometimes seen in the shop windows, or hung on the door-posts of certain artists—"*in hair*." Messrs. Bullock and Co. should take a lesson from the card-pictures of their talented fellow-townsman Mr. Robinson, whose tasty little bits of unpresuming landscape backgrounds (sketched by himself) are about the best models to which we could direct their attention.

Occupying the post of honour in the centre of the screen we are examining, hangs No. 37, a very large composition picture, *Officers of the 84th Regiment*, valued at 150 guineas, and exhibited by Mr. Brothers, of Manchester, representing a group of forty-one figures in various perfectly natural positions, but ranged in one long line right across the picture: the size of this picture is about 48 × 21 inches. Having heard so much of this production, and never having seen it before, we must confess to being very considerably disappointed. It is ingenious, displays great patience and perseverance, is a mechanical wonder, perhaps; but how it came about that the *Athenæum* and other journals could award such high praise to this picture for its artistic qualities we know not. There is certainly an absence of affectation, a simple unpretending ease about the positions assumed which is very praiseworthy, very natural, and very pleasing, but little else we fear can be said in its praise. The background is very neatly executed with the parallel rule, indian ink, and compasses of some unambitious architectural draughtsman, and is, so far, geometrically correct, perhaps, but—as is common to such work—has neither the depth, relief, nor genuine breadth of *chiaroscuro* which combine to form the picturesque. The portraits are all touched and are all very flat and feeble in effect. For ingenuity, patience, good posing of individual figures, and, above all, *for the bold attempt*, we can conscientiously praise the producers of this large "composition" picture; but we cannot avoid pointing out that something more is required to constitute real artistic excellence in so ambitious and difficult a department of the art.

J. de Mouxy exhibits a small case containing a photograph on ivory, coloured, a vignette printed on a dark instead of a white ground, and two copies from prints, glass positives. The ivory picture is very nicely painted, but the vignette is ruined by the brush of an "artist," who seemingly "touched" it with an idea that "all flesh" was brass, very highly polished, and the ground is much too dark.

A great number of large and excellent photographic bust portraits of literary, operatical, and theatrical celebrities are exhibited by Mr. J. G. Macandrew. These are very round and vigorous in effect, and, with but few exceptions, are all well deserving of praise, although in some cases the tones of the prints are too coldly black, and in others the negatives have suffered from underexposure.

No. 55, *A Holiday in the Woods*, by Mr. H. P. Robinson, is, to our thinking, the most masterly, perfect, and beautiful specimen of artistic and photographic composition that has yet been executed. The lights and shadows in every part of the whole are in harmonious keeping; the grouping is managed with the most consummate pictorial knowledge and skill; the story is most eloquently told in all the various actions and incidents; the just perspective is preserved in the relative sizes of the figures; and almost the only fault discernible is that which indicates a want of mechanical skill and ingenuity in so contriving that the outlines made by the scissors in cutting out the different figures should be lost or concealed, after the fashion of Rejlander. But, turning from this charming picture to No. 64, another subject-piece by the same artist, we are struck with dismay. Can it be possible that so feeble an attempt can emanate from the same source? Here we have a vacant-looking damsel, who, kneeling in her night-dress before a table, lays her finger unmeaningly upon a smudge on a shield, which, seemingly cut out of pasteboard, bears the heraldic lion in a rampant condition on its front, and is placed conveniently for the purpose upright before her. This is called "*Elaine*," and bears a quotation from the Laureate's "Idylls of the King." In the first place, the exquisitely beautiful picture painted by Tennyson is not realised even in the faintest degree. The vivid fancy which pictures the danger of her warrior—

> "And ah! God's mercy! what a stroke was there!
> And here a thrust that might have killed!"

and shrinkingly realises in the suggestions of the foeman's blows upon his shield all the terrible dangers of the strife—is exhibited neither in the attitude nor in the expression of Mr. Robinson's model. In the next place the costume might have been historically correct, and have been very much more picturesque in effect than the indefinite any-period drapery in which this young lady's form is so completely lost. Dion Cassius's description of Queen Boadicea—generally given in any work on British costume—would have furnished Mr. Robinson with many useful hints on this subject. In the third place heraldic devices upon the shield were only invented when, locked up in complete steel, the warriors had no other resource left by which to make themselves known to their friends and followers, therefore the rampant lion is out of place. And, once again, the shape of the shield is one which we have every reason to believe our rude forefathers never adopted—all the British shields of which we have any account or relics remaining being flat and circular, ornamented more or less with metal knobs and bosses. In the British Museum a shield exists which might well have served as a model for Launcelot's.

No. 65, *A Sleeping Child*, by N. E. Fitch, one of our most successful amateur portraitists—whose amusing and useful paper we recently published—represents a little fellow tired-out with play, and so falling asleep. The flesh is very flesh-like, which is more than can be said of all photographic portraits: the modelling is remarkably fine, and the general effect very picturesque and pretty.

No. 73 is Mr. Robinson's now well-known *Lady of Shalott*. Many valuable suggestions and just criticisms, as well as many that were unjust and valueless, have already been proffered in these and contemporary pages regarding this beautiful picture—the poetry and sentiment of which are in perfect accordance with those of the poem. The solemn gloom beneath the canopying willows, through which the palid white-draped form of the lady comes slowly and noiselessly gliding in her coffin-like boat is very expressive, and one has but to imagine the rising mists which wait to veil her for ever from our eyes, and the sickly, greenish

gleam of the fading twilight seen through the dark boles of the trees, and reflected in the water, to realise all the force and effect of the embodied sentiments. The picture has faults which have already been pointed out by other critics, and nothing now remains for us to add to the list save mentioning the frequent, formal repetition of parallel horizontal lines, and the unsubdued glare of the killingly-white and opaque patches on the water, the latter being the most seriously defective of all its chronicled shortcomings. Despite its failings (and what picture, be it painting or photograph, is altogether without such) this is a very fine specimen of the art's more ambitious and latest aspirings, for which, in behalf of photography and of its best and most earnest friends, we very heartily thank our clever fellow-labourer Mr. Robinson. If the reader desires to contrast a successful artist-photographer's works with an unsuccessful artist-painter's, let him visit this year's Exhibition of the Royal Academy, and look at No. 359, a small oil picture, which is either a very palpable copy from Mr. Robinson's *Lady of Shalott*, with a few alterations (which are not improvements), of the most trivial description, or a most unusually remarkable and astonishing coincidence of idea and execution. The painting is as inferior to the photograph in all the higher, as well as in all the less important, qualities of such a picture as it well could be. R. A. S.

WHERE TO GO WITH THE CAMERA.*

By Our Own Pioneer.

ROUND ABOUT THE CORNISH COAST.

Those tourists and artists who have time at command may make a variety of studies round and upon Tresparrot Down, where a small inn affords good quarters; and, as many conveyances are often passing by, luggage could be sent on to Bude or Launceston. Groups of sheep, cows, horses, and goats, may be taken on several parts of the moorside; while blocks of three or four cottages, an old barton, sheltered by trees, and broken dwarf walls, fill up the distances. The guide or directing posts about here are, for stereoscopic purposes, better calculated to produce roundness and effect than any to be met with elsewhere; the fingers or boards on which the names of places are painted being very broad, and the lettering bold and clear—black on a white ground—the uprights strong and solid, mostly erected at the fork of two or more roads, with a good way-side cottage, water-well, old outhouse, and a tree or so to fill up the sides; while, in some cases, broad openings in the hedge show in the distance an old church tower and white-washed village. About two miles from the Down, or the inn—which is generally known as "Sparrot Post"—is a place called St. Gennis, which will give a good series of pictures. The Church Town, as it is called, is an admirable subject. It may be as well to note that all places where the church is erected, if there be only one cottage or so, are invariably called "Church Town."

The St. Gennis Church is a small building of early English character, without a tower,—the west end having a low ivy-bound, pent-house top. This the antiquary may regret, but the artist will like it, as it adds much to its picturesque appearance. The great bluff called "Cambeak," and the Dazzard Head, with the fine point of Tremoutha Haven, are about two miles from here; but Crackerton is the most noticeable point of all—the broad, deep bay surrounded on one side by slopes covered with verdure, a few jutting craigs, and some goats; the other side having a wild, precipitous, and savage aspect; the bluffs to the right, rising in gigantic proportions, while the left shelve down gently to the old quaint mill, with its timber-leet, and dark water-wheel; the scattered huts of a few labourers and one or two boatmen, add to the scene and form a good point. This view has been (pictorially) spoiled by the erection of a modern house in all the ugly proportions of plaster, red bricks, and the usual stiffness of line and rule: the best thing in its favour is that, from the loft window over the stable many instantaneous views could be taken (permission would be readily granted for using the same), when all tenting would be superseded, and such pictures as the following could be secured: "waves dashing over a sandy beach"—"waves breaking among the broken cliffs"—"rising waves and foam-dashed rocks"—"coasters beating up in full sail," &c., &c.; or, should the tide be out and the weather calm and serene, an immense expanse of ocean looking towards Lundy Island—sand-gatherers with donkeys, and boys and women hauling in sea-weed—large masses of wreck half-buried in the sand—mossed and darkened sides of huge boulders heaped round and about in that confusion so much desired by the artist—these can be had in perfection; while up the valley rough stone water-courses, old foot bridges, hedges and banks overgrown with briar and young ash, are to be met with at different turns of either the high or low road.

A place called "Wainhouse Corner" is a convenient resting-place. There is plenty of room in the inn, and a good supply of water for any photographic purpose. From here High Cliff may be conveniently reached, computed to be 785 feet above the sea: the wild roaring of the dashing waves and the shrill scream of the sea birds being the only sounds.

The names of many Cornish places begin with "Tre," "Pen," and "Pol"—as Tresnewth, Penhale, Polperro—and are so scattered about here and there that numerous interesting little "bits" as pictures for the stereoscope can only be got at by the artist and operator visiting the various little hamlets from directions obtained on the spot. Otterham, about two miles from Wainhouse Corner, has much that is available for photography. Three fine views of the church may be taken: it is well situated for the purpose. These may include the rectory, old mill, barton, and various roadside scenes of tangled brake, shady lane, and dock-bound nooks—many of the docks growing about here in clusters of seven or eight feet high. To the east of Otterham, about four miles, is Warbstow. It was here on Warbstow Barrow, an old fortification, with traces of outworks on three sides, that John Wesley preached to assembled thousands. From the summit of this strong earthwork the view is most imposing and grand, and would be a good test for any panoramic lens, as the scene is uninterrupted all round. On one side is the broad expanse of sea, Lundy Island, Hartland Point, Moorwinstow, and a white house called "Chapel,"—built among some trees, and an object in this district for thirty miles round, with the intervening broken masses from Kilkhampton to Stratton; on the other side the eye glances over Bridestowe, Oakhampton, and various villages with their churches and towers, to the Devonshire Dartmoor hills; while sweeping round to the left of Roughtor and Brown Willy you have Launceston, Werrington, Boynton, Whitstone, Holsworthy, and the high and most conspicuous tower of Mary Week Church,—Warbstow Church, with Treneglos, lie in the hollow below. A cottage just at the edge of the Barrow road might be used to prepare wet plates. An inn at Canworthy Water can be made a resting-place; and from that the tourist or operator can pass on to Launceston, Stratton, Holsworthy, Bude, and various other intermediate places.

* Continued from page 212.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The final meeting of this Society for the session of 1861-2 tookplace at King's College, on Tuesday evening, the 23rd instant,—Professor C. B. Vignoles, Esq., F.R.S., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were ballotted for and duly elected members of the Society:—Messrs. Lenthall, Thomas Fenn, J. MacLean, and Charles Roberts.

The Secretary reminded the members that Mr. Peter Le Neve Foster, who occupied the chair at the last meeting, had stated that the prints shown by Mr. Warner, of Ross, were not taken from negatives obtained by enlargement. He (the Secretary) now desired, at the request of Mr. Warner, to correct that statement: the negatives were enlargements from pictures about $3\frac{1}{4} \times 2\frac{3}{4}$.

The Chairman directed attention to the following objects of interest sent for exhibition that evening:—An instantaneous shutter, exhibited by Mr. Dallmeyer; some photographs of Turner's pictures, by Mr. Thurston Thompson; a large collodio-albumen view of *St. Paul's*, by Mr. Sands; views of Australia, by Mr. Haigh; portraits of the Japanese Ambassadors, exhibited by Mr. Kater, and photographed by Messrs. Caldesi and Co., views of Genoa, by Messrs. Fothergill and Branfill; view of *Cripple's Home*, by Mr. Greenish; and some oil-coloured enlargements, by Mr. Gilling. The latter were full-length portraits of the kit-kat size, or about 24 × 19, enlarged from *cartes de visite:* the colouring was of a high order of merit, and was stated to have been effected without altering the likeness.

Among the portraits of the Japanese Ambassadors some were taken in an entirely new size for full-length portraits, and were called the "new album portrait." The dimensions of the actual photograph were $6 \times 3\frac{1}{2}$ and the length of the figure about 5 inches.

Mr. Dallmeyer observed, in reference to the instantaneous shutter, that, although it afforded him great pleasure to introduce the apparatus to the meeting, he ought to say that it was not his own invention, but had been constructed by Mr. Mann, of Bruce Castle, Tottenham: it possessed the advantage of allowing a more effective exposure in a given time than any shutter yet introduced. He would call attention to a modification of it constructed in such a way as to serve also as a hood for the lens. It would be seen that the portion first opened was the greater area of the field, and that first closed was the lesser area; so that it really gave a longer exposure in the same time than any other shutter—the springs being delicately adjusted, also, there was not the least shaking.

M. Claudet then read his papers *On the Enlargement of Photographs*, and *Rule for Finding at once both the Distances of Negative and Sensitive Surface for any Degree of Enlargement, and vice versa* [see pages 225 and 229], which were illustrated by throwing the enlarged images obtainable from negatives and positives on to a moveable screen which he had brought for the purpose, and also on the wall of the room. The arrangements necessary for these illustrations, which were very effective, occupied so much time that the discussion which followed was necessarily a very brief one. Before it commenced, however, M. Claudet somewhat astonished the members by removing the cracks from spoilt negatives by an operation of extreme simplicity, which consisted in rubbing charcoal powder over the negative with some cotton wool. In opening the discussion,

The Chairman felt constrained to express the great pleasure it had afforded him to listen to M. Claudet's very interesting paper, and he

was sure he should be only giving expression to the feelings of the members generally in saying so. M. Claudet's contributions to photographic science were by no means few or unfrequent, and were always of a valuable kind. The present communication was, he thought, in every way worthy of those hitherto received from M. Claudet. He (the Chairman) would be glad to hear any remarks which members had to offer on the matter then before the meeting.

Mr. HEATH desired to say a few words in reference to M. Claudet's paper. It would doubtless be remembered by those who were present at the last meeting that he (Mr. Heath) had undertaken, with the view of demonstrating the advantages of his method of operating, to produce an enlarged picture from the same negative as M. Claudet; and, in submitting his results to the meeting, he must say that, in his own opinion, he could not have had a better advocate for his (Mr. Heath's) method than M. Claudet himself. He (Mr. Heath) had explained his method of operating at the last meeting: he would not therefore occupy the time of the members that evening by going into detail, but would simply observe that it consisted in taking a transparent positive one-half the enlargement required from the original negative, placing that positive where the negative first stood, and enlarging *it* to twice its size, by which means he, of course, obtained a negative from which he could print any number of pictures such as he then submitted for the inspection of members. Those operations were capable of being performed in *any weather* by directing the camera towards the north light: and therein, he thought, consisted one of the points of superiority of his (Mr. Heath's) method over the one followed when the solar camera was used; for, whereas M. Claudet had only that evening used the word "despair" in reference to the delay in his operations, caused by the absence of *direct solar rays*, he (Mr. Heath) would take his pictures on any winter's day with perfect success. In submitting his results for inspection by the members, he wished to say that it was not done with any antagonistic feeling, but solely with the object of arriving at a decision on a scientific subject, by eliciting the truth connected with it. He would then put into the President's hands the pictures he had obtained for that evening's meeting, and, without indulging undue conceit, he might, he thought, be pardoned for saying that he did so with the utmost confidence. M. Claudet had brought a similar enlargement, which he submitted in the same spirit of friendly rivalry; and he (Mr. Heath) would, without hesitation, pass them together round to the members, and let them view each as a whole, or take any similar part in the two pictures and compare them. He thought they would not be long in coming to a decision as to which was the better picture.

A MEMBER observed that Mr. Heath's method of operating was known to everyone before the solar camera was introduced.

Mr. HEATH, in reply, wished it to be distinctly understood, that although he had the pleasure of originating the discussion on the subject at the last meeting, he did *not* claim anything new, except a few minor details in his method. He would say again that, when compared with the solar camera, it possessed marked advantages—he being able to do his work at any time, and those who used the solar camera being dependent for success on direct sunlight. It should be remembered, also, that M. Claudet's method was one of development, while he (Mr. Heath), having once obtained his negative, could print any number of copies in the usual way. He wished to make one other remark in reference to focussing. At the last meeting he had used a lens made by Mr. Dallmeyer, who supplied the equivalent focus of it: he (Mr. Heath) had used a scale attached to his camera, the graduations in which were made in accordance with and founded on the equivalent focus of the lens. He could not help thinking that this was a simpler method than the scale and tape suggested by M. Claudet. As evidence of its accuracy in working he would direct attention to the thread marks in the curtain of the picture, which he then handed to the Chairman.

Mr. MAYALL said he had been engaged a great number of years in the practice of photography, and in the exercise of both the methods of enlargement under the consideration of the meeting that evening, and, as the result of his experience, he had come to the conclusion that, although the solar camera possessed one or two defects, he still had no doubt that the solar camera, after undergoing sundry improvements now in progress, would be far superior to any other arrangement for enlarging. He might mention, notwithstanding the difference of opinion entertained by Mr. Shadbolt on this point, that it had the advantage of admitting of enlargement to almost any extent without distortion. He (Mr. Mayall) could not but regard the method followed by Mr. Heath as roundabout, when, by means of the solar camera, an image even twenty-five feet high might be obtained, quite free from distortion. The present requirements of the solar camera, in order to make it a perfect instrument, were, he thought, a lens precisely adapted to the condenser, larger and purer paper, or paper better albumenised. When those desiderata were secured, he felt no doubt that solar camera enlarged pictures would be obtained far superior to any other method. He must say that, remembering that he had some years ago given great dissatisfaction to the Society by asserting that the solar camera was not new, he had come with some little curiosity to see and hear the proceedings at the present meeting. He held in his hand a duplicate of a solar camera, made some fifteen years ago for Dr. Carpenter, by Mr. Willatts, of Cheapside; and he might mention that that was, in point of fact, the origin of the present solar camera for enlarging portraits. He was aware that he might go back still further, and revert to the days of Tully's solar microscope; but he thought the present instrument was sufficient to illustrate the fact that Woodward's solar camera was not a new invention. He had shown that very instrument to Mr. Woodward when he was in London, with the view of undeceiving him as to the idea he seemed to entertain of his being the original inventor. He (Mr. Mayall) thought there was sufficient interest attaching to the little apparatus which he then exhibited to make it a suitable thing for him to offer for the acceptance of the Society which he had much pleasure in doing, merely stipulating that Mr. Willatt's name should be mentioned as the maker, and the fact stated that it was of similar construction to the one made also by Mr. Willatts for Dr. Carpenter. He (Mr. Mayall) intended to have brought some photographs on plain and salted paper, which would have happily illustrated and supported the opinions he had expressed, but he had been unfortunately prevented. He might say, in conclusion, that in justice to a new invention or application of an old one, they ought to push it forward to perfection rather than go back to what they already knew to be imperfect and troublesome. He had obtained with pure paper, by the method he advocated, results as good in one or two hours as those obtained in the pressure-frame from a negative. He knew that there were several eminent investigators then engaged in experiments, with the object of perfecting the solar camera, and he had no doubt their efforts would be ultimately crowned with success. He might add that the efforts made by Mr. Atkinson, of Liverpool, to render the solar camera suitable for use in this country were in every way deserving of praise.

Mr. WARNER, who advocated Mr. Heath's method of manipulating, reminded the members that M. Claudet said he had waited nine months for the sun; now he (Mr. Warner) had commenced his operations on a rainy day in February, using a quarter-inch stop. He thought the reflected light obtained from wet objects had materially tended to the success of his operations.

Mr. HEATH, in reference to a remark which had been made during the evening, craved permission to explain that in introducing his method to the notice of the Society he had been actuated solely by the desire to communicate what had proved in his hands a superior method to any hitherto in use for enlarging small pictures to 12 by 10; and as such was the case an unprejudiced glance at the subject must convince anyone that it was not a question of his method *versus* the solar camera method, since he had not questioned the value of the solar camera at all, but had only stated what he conceived to be the advantages of his own.

The CHAIRMAN, in rising to propose the usual vote of thanks to M. Claudet, desired incidentally to remind the members that there were other countries on which the sun shone with greater brilliancy and frequency than in England, and there the solar camera might doubtless be worked with unvarying success. In reference to M. Claudet's focussing scale, he might, as a mathematician, express his opinion that it was mathematically correct. He was sure the members would unite with him in passing a cordial vote of thanks to that gentleman for his interesting and valuable communications.

The thanks of the Society were unanimously accorded to M. Claudet.

Mr. MAYALL would briefly observe that direct sunlight was not imperatively necessary in working a solar camera, but that the reflected light obtained from a bright white cloud was sufficient.

Mr. DALLMEYER alluded to a contractible stop invented by Mr. Dafft about four years ago, intended originally as a torsion valve, but which he (Mr. Dallmeyer) thought if applied as a diaphragm to a lens would be found to act even more efficiently than the one described by M. Claudet.

The thanks of the Society having been given to Mr. Mayall for the instrument he had presented that evening, the proceedings terminated.

The next meeting of the Society will take place on Tuesday, 7th Nov.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The final meeting of this Society for the session 1861-2, took place at the City of London College, on Thursday Evening, the 12th instant,—the Rev. F. F. Statham, President, in the chair.

The minutes of the last meeting were read and confirmed.

The SECRETARY read a letter from Mr. Borchert, who, while declining to continue in office as a member of the Committee, expressed the pleasure he had enjoyed in intercourse with the members of it with whom he had been associated, and also the gratification afforded him in witnessing the success of the Society in its Exhibition of photographs at the Crystal Palace.

Mr. J. J. COLE desired to withdraw his name from the list of the Committee, but would freely place his chambers in Essex Street, Strand, at their disposal, when a central place of meeting should be found desirable.

The PRESIDENT then called on the Secretary to read the

ANNUAL REPORT.

At the conclusion of this, the third year of its existence, your Committee have much pleasure in assuring you of the satisfactory and promising aspect of the Society's affairs. At our last three or four meetings we elected sixteen new members, many of whom have already displayed the most laudable activity in forwarding the interests of the Society. At no one of our pleasant monthly meetings have we lacked either an interesting and useful paper, or the elements necessary for originating an animated discussion; and our Treasurer's account will show that, despite unusually heavy expenses, we have, for the first time, a balance in our favour. The papers read were as follows:—

Oct. 10.—*Photography at the International Exhibition of* 1862. C. Jabez Hughes, *Vice-President.*

Oct. 10.—*On the Photogenic Action of Colour.* Thomas Clarke.

Nov. 14.—*On Mounting Photographs.* G. W. Simpson, *Vice-President.*
Dec. 12.—*A Prologue for the Season.* V. Blanchard.
Jan. 9.—*On Mealiness in Toning.* S. Fry.
Feb. 21.—*On the Manufacture of Collodion.* S. Davis, *Vice-President.*
Mar. 13.—*The Experiences of an Amateur in Portraiture.* N. E. Fitch.
April 10.—*On Photographic Reproductions.* A. H. Wall. *Hon.-Secretary.*
May 8.—*On the Use of Bromides in Collodion.* V. Blanchard.

The Committee take this opportunity of thanking the authors of the above for their generous labour in the Society's behalf. It is hoped that the useful little papers which were first introduced to our meetings by Mr. Hannaford, under the title of "Photographic Jottings," will not be entirely absent from our next year's list of papers as they are from the above.

The Society has another source of gratification in the successfully-organised Exhibition at the Sydenham Crystal Palace, which, it is hoped, will be the first of a series of annual exhibitions, each at least equalling it in the number of contributors and in the quality of the contributions; for it should not be forgotten that painting, sculpture, engraving, and other branches of fine art, all date their prosperity and influence from the establishment of periodical exhibitions. The present Exhibition of this Society has been brought to its very satisfactory position mainly by the untiring energy of the Exhibition Sub-Committee, to the members forming which, and to the Secretary of the Society who assisted them, the best thanks of the Committee are very gratefully awarded.

The Committee also desire to express their thanks to those gentlemen, friends and members of the Society, who have kindly contributed to the folio during the past year.

Special thanks are also due to Mr. Samuel Fry, Mr. C. Jabez Hughes, and Mr. J. J. Cole, to whose kindness the Society is indebted for the gratuitous use of apartments in which the Committee and Sub-Committee have held somewhat frequent meetings.

Availing themselves of the present opportunity, the Committee also desire to thank the exhibitors whose productions are now at the Society's Exhibition.

Among the few sources of regret which have arisen during the past season have been the retirement from an active participation in the proceedings of the Society—in consequence of a change of residence—of our Vice-President, Mr. C. Jabez Hughes; and that of one of the most active members of the Experimental Sub-Committee, Mr. Hannaford. We have another source of such feeling in the fact of our Secretary and Treasurer having tendered their resignations. The Society owes its existence primarily to the efforts of these gentlemen, and having now held office for three years, their retirement cannot but prove a source of regret to the members generally. It is part of this evening's business therefore to elect their successors.

In reviewing, as is usual, the progress of photography during the past year, we find such progress chiefly made palpable in an artistic direction. No new scientific facts of particular importance have been developed in connexion with the art—no particular novelty in process or apparatus has been introduced to notice; but in every department, artistic, chemical, and optical, very rapid strides have been made in the direction of pictorial truth and beauty. Every paper read at our own meetings, and nearly every paper read before kindred associations, have had their bearing more or less direct on the perfection of photographs as pictures; and in the photographic journals the principles of art in their applications to landscape and figure compositions have received regular and continued attention. We think this is an advancement in the right direction.

The claims of photography as a fine art have been put prominently forward since our last annual meeting, and no little controversy has arisen in all quarters from the fact of the Commissioners of the International Exhibition having classified photography under the term "mechanical." The Central Society took an active part in opposing such an arrangement, and called upon all Societies devoted to the art to join them in protesting against its injustice. In reply to a circular letter from Dr. Diamond, the South London Society, while thanking and applauding the Council of the Central Society for the energy and character of its proceedings, and fully approving the object thereof, expressed a hope that it (the Central Society) would not take such steps as might tend to exclude British photography from competing upon equal terms with its foreign brethren and rivals. The controversy between the Commissioners and the Council of the Central Society, which commenced in the May previous, having terminated very unsatisfactorily in August last, and all appearances seeming to argue the entire neglect of the interests of photography, so far as regarded its connexion with this country and the Great Exhibition, the South London Society took action in the matter, and memorialised Her Majesty's Commissioners, urging the importance of making immediate arrangements which might induce photographers to co-operate in the production of such a result as should best serve the art, and do most honour to the country. Steps similar to those proposed in the memorial were taken by the Commissioners, and shortly after their Secretary, Mr. Sandford, politely acknowledged its receipt.

Much dissatisfaction has been pretty generally and pretty justly expressed with the position assigned to British photography in the International Exhibition. The art has been located in the smaller portion of a comparatively small apartment, situated in the most remote part of the building, and approached by a most uninviting entrance, with scarcely a notice to indicate where it may possibly lead to, the said entrance appearing more like the opening to a ventilating shaft than anything of greater consequence.

Despite the insult to which photographers generally have been subjected in the catalogue classification, however, photography is to the full as attractive as any other portion of the great show, and will undoubtedly carry off high honours, of which the share of this country will be by no means insignificant; for, contrary to public expectation, British photography ranks proudly with the best of its foreign companions.

The out-door meetings, which were so pleasantly taken advantage of during our past recess, will be resumed during the present, only instead of meeting once a month, it is proposed that we meet once a week; and, to avoid some of the chances which led to no little apprehension and disappointment last year, the dates and places of meeting, with the hour at which we shall assemble, will be announced before the close of this evening's proceedings.

The presentation print selected for the past year, in pursuance of the plan adopted by the first managing Committee, of selecting from the works of some eminent photographer a specimen illustrative of a distinct phase of the art in connexion with some one distinctive process, was selected from the works of Mr. H. P. Robinson, of Leamington, being a landscape by the wet process.

At the conclusion of the reading of the Report, the PRESIDENT invited Mr. Howard, the Treasurer, to read *his* Report.

Mr. HOWARD said that numerous engagements had prevented his drawing up a formal report. He had much pleasure, however, in submitting his balance-sheet. It would probably be remembered that the last balance-sheet showed a deficit of £3 16s., the present one, however, he was happy to announce, showed a surplus of £9 16s. 11d. [This intelligence was received with enthusiastic expressions of gratification by the members.] He attributed this surplus to the fact that the *Journal* was not now sent to the members as heretofore; but he felt assured that the members would consider that an equivalent had been fully secured by the issuing to each member of a season ticket for the Crystal Palace. His (the Treasurer's) accounts had been carefully examined by the gentlemen (Messrs. Harmer and Hart) appointed as auditors, and if, after examination of the balance sheet, which he now handed round, any member desired further information, he should be happy to give it.

The CHAIRMAN, after the unanimous adoption of the Reports read by the Secretary and Treasurer, felt that the members would all agree in regarding them as highly satisfactory in every respect; and he thought it matter for unfeigned regret that, after the rendering of such reports, the Society should have to consider the resignation of the two officers who were mainly instrumental in bringing about a result so gratifying. The members generally would not be insensible to the magnitude of the labours undertaken by these gentlemen in concert with the Committee of the Society, and it could not fail to be a source of satisfaction to them, as a body, to reflect on the complete success which had attended the South London Photographic Society's Exhibition at the Crystal Palace. While expressing what he felt must be the sincere regret of every member at the resignation of their excellent Secretary, Mr. Wall, he felt sure he need not remind them of his unflagging diligence. That gentleman had been present at every meeting, prepared the minutes of all the proceedings, and during the intervals had exerted himself in securing papers for the meetings which were to follow. His (Mr. Wall's) services had been so efficient in every way, that without derogating from the capabilities or willingness of a possible successor, he doubted if they should find a gentleman so well suited to the duties, and he would suggest that Mr. Wall be invited to retain the office, and that an Assistant-Secretary be appointed to share his labours. He (the President) was sorry that he should have to give expression to similar sentiments with reference to the Society's worthy Treasurer, Mr. Howard. As, however, that gentleman felt that his numerous engagements were incompatible with his continuance in office, the members must indulge the hope that they would find an efficient successor in Mr. N. E. Fitch. He (the President) might be allowed to say for himself that he should like also to have withdrawn his name, since he felt that gentlemen might be found better acquainted with the science for the advancement of which the Society was founded, than himself; moreover, his duties in the large parish of which he had the spiritual charge prevented him from giving that attention to the subject which he desired; he should long ago have stained his fingers with the nitrate of silver if time permitted. If, however, the members thought that the little attention he could bestow, and the exercise of common sense, as distinct from practical knowledge of the subject, would be useful to them, his services were at the disposal of the Society, and he would allow his name to remain attached to the office of President, upon the condition that his occasional attendance only should be expected.

Mr. CLARK WESTFIELD had much pleasure in proposing votes of thanks to the President, Secretary, and Treasurer, and in doing so he felt sure he was only giving expression to the sentiments of the members generally.

Mr. SIMPSON, in rising to second the proposition of Mr. Westfield, could only re-echo the expressions of regret made by the President at the resignation of Mr. Wall and Mr. Howard. He might add that he had endeavoured to induce Mr. Wall to continue in office with the assistance of an aspirant who would enter his noviciate under that gentleman's guidance, and if now he was finally unsuccessful he was glad to be able to propose Mr. Harman as Secretary.

Mr. MARTIN seconded the proposition.

Mr. WALL, though willing to take all the honour, if any one else would do the work, would say that there would be practical difficulties in the way of such an arrangement. Members, for instance, if addressing letters to him as Secretary, would not altogether like being replied to by another person: on the whole, therefore, the gentleman who undertook the labour should also have the honour.

After some desultory discussion, the following gentlemen were elected as officers for the ensuing year:—

President—Rev. F. F. Statham.

Vice-Presidents—Mr. Davis, Mr. G. W. Simpson, and Mr. Wall.

Committee—Messrs. Ackland, Blanchard, Foxlee, Harmer, Howard, Leake, Martin, and Newcombe.

Treasurer—Mr. N. E. Fitch.

Secretary—Mr. Harman, 3, Albert Cottages, Hill-street, Peckham.

Mr. MARTIN proposed, and Mr SIMPSON seconded, that the Committee meetings should take place on the same evenings as the general meetings of the Society, one hour before the commencement of the usual proceedings.

The proposal was adopted, Mr. Wall only dissenting therefrom.

The thanks of the Society were recorded for the services of those gentlemen who, as Vice-Presidents, had been so constant in their attendance at the meetings, and so active in forwarding the arrangements connected with the Crystal Palace Exhibition.

After a somewhat lengthened discussion, the following places were appointed for the out-door meetings of the Society during the recess. These meetings are appointed to take place on the first and third Saturday in every month, as near one o'clock as possible:

1. Jack Straw's Castle, Hampstead Heath, to be reached by omnibus; or
2. Richmond Station, by rail from Waterloo Station.
3. Charlton, by North Kent line from London Bridge.
4. Beckenham Station, by Mid-Kent line.
5. The Eagle, Snaresbrook, from Shoreditch Station.
6. Barnet, by omnibus, or by Great Northern Railway.

Mr. MARTIN proposed a general meeting of the members at the Crystal Palace on the last Saturday in September.

The first meeting of the Committee will take place on the third Friday in September, at 433, Strand, at seven o'clock, to consider the arrangements connected with the general meeting proposed by Mr. Martin, to take place at the Crystal Palace.

After this announcement the meeting separated.*

MANCHESTER PHOTOGRAPHIC SOCIETY.

The ordinary meeting of this Society was held on Wednesday, the 4th inst., 1862,—John Parry, Esq., Vice-President, in the chair.

Mr. Consterdine presented two views for the Society's portfolio, and which were interesting as illustrating the process of Messrs. Petschler and Mann. The pictures were much admired; and, although the exposure given for the negatives was considered to be beyond that required for collodio-albumen, the process certainly improved in general estimation.

Mr. Wardley remarked that the length of exposure required was, perhaps, due to the condition of the collodion. In the Taupenôt process that was not an element that affected the result; but it was otherwise with this, for which a sensitive collodion was required for the most rapid results

Mr. Consterdine also showed some pictures obtained by the microscopic apparatus, explained by Mr. Parry at a recent meeting of the Society, and the instrument which he had constructed was handed round the room.

The Chairman showed the last result of his experiments in panoramic photography, with an ordinary view lens. In the negative exhibited to the members the joining of the two pictures could scarcely be perceived. He stated that he was persevering with that method of obtaining pictures, and should be able, he believed, to produce satisfactory specimens at the next meeting, and he would then go fully into the subject. At present he would merely observe that the two pictures were taken with one lens, and that he did not cause them to overlap each other.

Mr. Noton stated that he had an aceto-nitrate bath, which after it had assumed the brown tint which follows the immersion of albumenised plates, became quite colourless; but upon adding acetic acid it again became discoloured.

Mr. Wardley said that the usual bath for the Taupenôt process always behaved in that manner when the acetic acid had gone off by evaporation: the more acid that the bath contained the darker would be its colour. Taupenôt plates, he added, might be excited in a neutral bath which would retain its purity, but they would not keep.

Mr. Offer asked whether that plan would not also induce blisters?

Mr. Wardley thought not. In reference to blisters, he observed that they might frequently be avoided by increasing the strength of the silver bath.

Mr. Noton said that during the last cold weather he had been troubled much with blisters.

Mr. Wardley said that in all photographic processes great attention should be paid to the temperature of the laboratory, when it fell below 60° difficulties were certain to arise.

Mr. Hebert had observed that humidity in the atmosphere was a great cause of blisters: he had noticed that steam arising from the hand during the coating of the plate often induced them.

Mr. Petschler said a deposit of moisture must of course take place if the plate were colder than the atmosphere.

Mr. Rogerson said that photographers were in the habit of holding the plate too near the mouth, and a condensation of moisture was therefore inevitable. He thought it a good plan to warm the plate slightly before coating it with collodion. It was also a common practice to hold the plate at one corner, and there the film was always loose because the moisture from the thumb prevented the collodion from actual contact with the glass.

It was generally thought that much in photographic operations depended upon the temperature of the room, to which Mr. Rogerson added "and that of the operator."

Mr. Petschler exhibited some prints taken from negatives on Dr. Norris's dry plates. The subjects were exceedingly interesting, they being groups of ladies and gentlemen taken during a recent excursion of the members of the Field Naturalists' Society.

Mr. Noton said that in working with his double albumen process he had been making some attempts to get iodide of silver into the film by placing it in the albumen previously to coating the plate—his object being to open out the material.

Mr. Wardley thought if the thing could be accomplished without detriment to the picture that it would not be likely to answer the end in view. He thought that it would rather tend to harden the film.

Votes of thanks having been accorded to Mr. Consterdine and the Chairman, the meeting was brought to a close.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

A special meeting of this Society was held in the Religious Institution Rooms on the 29th ult.

After the minutes of the previous meeting had been read by the Secretary, and approved of by the Society,

The Chairman read the requisition for a special meeting, signed by ten members, in accordance with rule 17, for the purpose of considering a motion for the dissolution of the Society: he also read the circular calling the meeting. Having done so, he remarked:—It is now my painful duty to call upon the gentleman who is to propose the motion for the dissolution of a Society of which at one time we had so much hope; but which, owing to a feeling of dissatisfaction having arisen among its members, has suffered much from causes too well known, as also the utter failure of all attempts to overcome that feeling. Such being the case, although the most extreme measure, it seems to me now the only one we can adopt.

Mr. Hugh Macfarlane then read the motion—"That this Society be dissolved, its rules having been found unsatisfactory and deficient by the majority of the members."

Mr. John Spencer, Jun., seconded the motion, which being put to the meeting was individually and unanimously carried.

A conversation followed on the best means of disposing of the Society's property and funds.

On the proposition of Mr. James Stuart, a Committee of three gentlemen was appointed to wind up the Society's affairs.

Mr. J. Jex Long proposed a vote of thanks to the Secretary, Mr. J. Ewing, which was seconded in very complimentary terms by Mr. Mactear.

Mr. Ewing briefly replied, craving a vote of thanks for the members of the Council and other office-bearers, which was warmly awarded, and also to the Vice-President for his conduct in the chair.

The City of Glasgow and West of Scotland Photographic Society was thus dissolved.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

The final meeting of this Society, for the session 1861-2, took place on the 2nd inst., under the presidency of M. Gabriel, who, after the admission of new members, congratulated the Society on the steady increase which was observable in their numbers.

The Secretary, having opened the correspondence, mentioned the letter of congratulation addressed to M. Poitevin in accordance with the expressed wishes of the members at the last meeting.

Letters were read from the following gentlemen:—M. Oppenheim, of Dresden, on some precautions to be observed in working his process for transparent positives on glass; and M. Cathala, of Paris, advising the Society of the despatch of some samples (since received) of photographic products, chemically pure.

M. Vidal, in thanking M. Cathala in the name of the Society, directed the attention of the members to the happy results likely to follow the employment of pure chemicals. Manufacturers, at least, would be freed from the imputation which generally attached to them as each new failure occurred, and amateurs and professionals would work with a fuller assurance of success, inasmuch as they would have at their disposal absolutely pure products, the proportions of which, according to certain determined formulæ, would yield almost invariably the same combinations.

A special Committee, composed of MM. Jacquemet, Vidal, Meynier, and M. Cathala, and report upon them at the next meeting.

MM. Gazin and Co. gave notice, by letter, to the Society, that in future they would supply all salts of gold and silver under the guarantee of a commercial assayer.

M. Vidal expressed his gratification at this notice, tending, as it did, to support the observations he had made relative to the products sent by Thobert, would make a comparative examination of the products sent by M. Cathala.

M. Jacquemet desired to read a letter from Dr. Sabatier, on positives by reflection and transmission.

The second part of this memoir elicited marked attention from the Society. M. Vidal reviewed what was most interesting in this communication, and urged the members to experiment on a process the practical utility of which was incontestable, if the phenomena indicated by Dr. Sabatier were produced in a constant manner.

A memoir, entitled *Photography in the Army*, was laid on the table, but the advanced hour precluded the possibility of reading it. M. Hudelet was invited to make a summary of the contents, and report thereupon at the next meeting.

The thanks of the Society were accorded to Dr. Sabatier.

The President laid on the table two pamphlets presented by their authors to the Society—one on enlargement, by M. Charles Chevalier, and the other a *resumé* of the various processes of producing photographic impressions without salts of silver, by M. Poitevin. These gifts were received by the Society with thanks.

M. Jacquemet proceeded to open the French publications of the month, and directed especial attention to the various efforts made to perfect the dry collodion processes. This *resumé*, habitually made by M. Jacquemet, interested the Society very much. One process for transparent positives, by M. Poitevin, commanded special attention. This process, as it borrowed also the aid of light during development, the same as Dr. Sabatier's, possessed the greatest interest. The thanks of the Society were accorded to M. Jacquemet, and M. Tissot was invited to undertake a similar task for the next meeting.

The members generally were then invited to introduce any matters of interest they might have to bring before the Society.

M. Meynier introduced an instantaneous shutter of the most perfect action; also some instantaneous views which he had taken by its aid.

M. Chazal showed another of a different construction from M. Meynier's, the distinction being that in this one the lenses were closed by two discs moving round a central axis, which opened and shut the lenses by a simple movement of one-half a rotation on the axis, while that of M.

* Note.—Mr. Worman will oblige the Secretary by furnishing his address.

Meynier was closed by a kind of trap-door, which opened from the bottom to the top, and closed itself rapidly by the pressure of combined levers.

The detailed description of these pieces of apparatus will accompany the report of the Committee appointed to examine them and report upon which form is to be preferred. This Committee is composed of MM. Hudelot, Guilbault, Taylor, Teisseire, and Rey.

M. Vidal exhibited, in the name of the inventor, M. de Gerin, a camera-stand, called by the inventor "*En-cas Photographique.*" This stand, in fact, resembled most completely an umbrella in its case, on withdrawing it from which it developed itself into a solid, light, and convenient stand. M. Vidal descanted on the advantage of being able to walk with this stand through the streets of a city without having the appearance of carrying anything but an umbrella, and asked permission to show his own polygraphic apparatus, mounted on a similar light and convenient stand. He (M. Vidal) showed also three complete cameras for the $\frac{1}{6}$, $\frac{1}{8}$, and stereoscopic plates, each of which may be used on the same stand.

A Committee was appointed to examine and report upon these, and also on the camera stand of M. de Gerin. The drawings and descriptions of the apparatus will be attached to the report, which will be finally published.

A micrographic apparatus by M. Mechen, of Paris, was also shown by the Secretary, and a Committee appointed to examine and report upon it.

M. VIDAL desired to communicate some successful experiments he had made by washing a Taupenôt plate with a solution of three per cent. of tannin after the final washing and sensitising. The advantages which he found accrue were that the exposure was diminished 75 per cent., and the development considerably expedited. He showed a negative obtained in that way in his polygraphic apparatus, and directed attention to the black character of the image, which was generally of a deep brown when albumen alone was used.

The members were invited to experiment on this modification.

M. JACQUEMET read the report which he had made upon the *valet-griffe*, patented by M. Cristin, by means of which it was possible to collodionise, sensitise, place in the camera back, and, after exposure, develop, fix, and wash without the fingers touching the plate:—

"This very ingenious instrument will be found very useful for those who prepare plates for the dry processes. The reporter having himself tried this accessory apparatus is satisfied of its good qualities, and would submit that the *valet-griffe* of M. Cristin is in every way worthy of the approbation of the Society."

Before closing the meeting, the SECRETARY announced to the Society that the Art-Union, of which the Society formed a constituent part, was definitely dissolved.

The late hour necessitated the postponement of other matters until the following meeting.

The President showed some remarkable prints by M. Guillemot.

M. Cazalis showed some interesting panoramic views, taken from the Zoological Gardens of Marseilles, after the examination of which by the members the meeting separated.

Foreign Correspondence.

Paris, June 10th, 1862.

I SEE in the last number of THE BRITISH JOURNAL OF PHOTOGRAPHY a note by Mr. Shadbolt respecting Dr. Sabatier's communication. For myself, I care not to reply to the observations therein contained, and that for two excellent reasons—the first being that I did but transcribe the author's own explanation; and the second, that it would ill become me to discuss the opinion of such a practised experimenter as Mr. Shadbolt. I will therefore keep to my reporter's *rôle*, and say that the majority of our photographers are of Dr. Sabatier's opinion as to iodide of potassium, and agree in considering the collodion prepared therewith as less sensitive than that prepared with iodide of cadmium. The fact has been adverted to by several writers. In his study on the iodides and bromides M. Reynaud said lately:—"A well-known fact is the slowness with which the iodide of silver resulting from the decomposition of the iodide of potassium receives the luminous impression."* As to the iodide of cadmium the same author adds:—"The iodide of cadmium possesses photogenic properties opposed to that of the iodide of potassium as far as rapidity is concerned, for it is one of the promptest in receiving the luminous impression."

It might possibly be that the want of rapidity attributed by our photographers to the iodide of potassium arises from impurity in the article as it is found in commerce; and in that case Dr. Sabatier would be all the more excusable for sharing an erroneous opinion, as he is living in a little village, and has at his command only those means which are within the reach of a modest and laborious amateur. I may add that in a recent communication he tells me of important modifications which he has introduced into his process, and which greatly simplify it. They consist in letting in the light upon the glass at the moment when the negative has reached its summate of perfection. The image immediately becomes positive, and is developed admirably. To secure success it is necessary that the negative should not be completely finished at the moment when the diffused light is admitted; that the sensitising bath should be rigorously neutral; that the development should have been done with pyrogallic acid, to which no other acid than acetic had been added. The alkalies provoke the positive formation, which is, on the contrary, opposed by the nitric, sulphuric, and hydrochloric acid, and even by citric acid.

The fact on which the modification is based is that pyrogallic acid—which in the camera reduces the iodide acted upon—combines with it, on the contrary, when submitted to the action of diffused light.

M. Poitevin has also imagined a process for obtaining direct positives. He employs a collodion containing less iodide than that generally used for the obtaining of negatives. He sensitises in the usual manner, and exposes the film to the light for a few moments, without its changing its aspect on that account. He washes the plate in abundance of water, and when he wishes to operate, he pours upon the prepared plate, still damp (or which he wets if it has grown dry), a solution containing four grammes of iodide of potassium, very pure, to 100 grammes of water. An alcoholic solution of iodide may be made with the same proportion, if the film is dry. All this must be done in the dark. The plate is now placed in the camera, then washed in distilled water, and plunged into a two and a-half per cent. nitrate of silver bath. By pouring upon the image thus produced a solution of pyrogallic acid, with an addition of lactic acid, all the parts not acted upon are developed in black. The developing is done as for ordinary *clichés*, and the fixing also. M. Poitevin has modified this first process by substituting for the pyrogallic acid in the development sulphate of protoxide of iron, acidulated with citric or tartaric acid.

M. Poitevin thinks that many alkaline and saline substances destroy, under the luminous influences, the effect produced by the first insolation of the sensitised collodion film. He mentions, in the first place, the cyanide of potassium, which is more active than the iodide; the bromide of potassium, which acts but little; the cyanide, saturated with iodide of silver; the bichromate of potash, especially acidulated with sulphuric acid; diluted hydrochloric acid; and, lastly, iodine in vapour, which completely destroys the first insolation.

The French Society of Photography has not had any meetings since the end of April. I have therefore nothing to communicate from that quarter. The fact is that all our photographers, whether investigators, experimenters, or professionals, are exclusively occupied with the Exhibition at London. I know no one but Pierre Petit who has preserved sufficient liberty of mind to look in any other direction than that in which all thoughts are turned. He has gone to Rome. True, the occasion was favourable. He desired to complete his gallery of the Episcopate, and he knew that he should find assembled in the capital of the Roman Catholic world a crowd of prelates called thither at this period by the duties of their mission.

ERNEST LACAN.

Philadelphia, May 25, 1862.

AN English lady about visiting America, in selecting presents for her transatlantic friends, purchased a neat *wooden* stereoscope. She paid more for it than for some of the more elaborate *papier-maché* ones. She would not buy the latter kind, as "they were too common in Birmingham." But, on reaching our shores, she found that what was so *common* in England was very uncommon with us. It is so with correspondents from foreign countries: we are apt to make no mention of the matters of every-day occurrence at home, although they might be the most interesting items of news to our readers. Photography, essentially the same all over the world, has modifications peculiar to each country and even to each city; and it is a matter of curiosity to note their peculiarities, even to the simple act of holding a plate while flowing. Thus a New Yorker expresses surprise that a Philadelphian should hold a plate by the left hand lower corner, and pour on at the right hand upper corner; and thinks it should be poured at the lower right hand corner, flowing around the plate and back off the same corner. It is all a matter of habit or education in either case; and we can generally work best in the way we have been most used to. The same may be said of salting plain paper. Some will immerse the paper and allow it to soak in the water, while the majority merely draw it once through the water, salted forty-five grains to the quart. Some float their plain paper on the ammonio-nitrate solu-

* *Moniteur de la Photographie*, first year, No. 22.

tion; but, in that case, they prepare it very much the same as the bath now used (and before described by me) for albumen paper, while others adhere to the old method of brushing on with cotton wool or Canton flannel. I believe the articles called here "Yankee clothes-pins," or the spring clips for holding clothes on to the lines while drying, are in common use in England for photographic purposes as well as in America.

Now another invention designed for the laundry has presented itself as a valuable assistant in our art: I allude to what is here sold as the vulcanised rubber rolls for wringing clothes. These simple and useful machines have been made in various ways, the essential principle of all being in the use of two rubber rollers pressed together by elastic bands: between these rollers the clothes to be dried are passed, and the water is squeezed out without injuring the fabric in the least. In Professor Seely's laboratory I saw one of these little machines in use to dry gun-cotton; and at the Franklin Institute, in Philadelphia, also, one was on exhibition. The person showing it to the members, in proof of its merits, stated that the most delicate material was uninjured by the pressure. To demonstrate which he had a number of pieces of a very rotten newspaper—rotten in politics as well as in material—soaking in the tub: pieces of these he passed uninjured through the rollers, thus suggesting an excellent way of drying off prints and expelling the bulk of the water and hypo.

Since the advent of the card-pictures there has not been as much use for the solar cameras as before. Still those who have made a speciality of this class of work have plenty to do. This is the case with Broadbent and Co., of Philadelphia. Mr. T. A. Wenderoth, one of the partners, and the inventor of what is known as "ivorytypes," has given a great deal of attention to the business of amplifying, and with remarkable success. At first he used the Woodward camera with the reflector: he has, however, dispensed with the mirror, and has his instrument mounted in a room about twelve feet square, the whole room being arranged to turn on a pivot, with a circular iron track provided with gearing to cause the rotation. His condensing lens is double, and is eighteen inches in diameter: the direct rays of the sun passing through this fall on the *cliché*, which is so placed as to be covered by the condensed circle of light. The half-size quick-working lens is placed at such a distance from this that the continually decreasing circle of light just fills the opening of the object-glass, while the condensed rays come to a focus on the back lens of the combination. A blackened diaphragm below the back lens does away with the solarised spot (common to many enlarged prints), and does not interfere with the quickness of printing. I have seen a print two feet wide by three feet long made from a half-size negative in one hour. As a general thing he uses negatives whole size—*i.e.* 6½ inches by 8½ inches—and allows the light to fall on this in a circle 6½ inches diameter. He objects to the use of a mirror, as it lengthens the time of exposure very much. His pictures are remarkably sharp, and of fine gradation of tone. These large prints are rather heavy to transmit by mail, but I shall send one to the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY by the first private opportunity. Mr. Wenderoth considers that he is working under the Woodward patent, even though he has dispensed with the reflector, stating that to Mr. Woodward is due the use of a condensing lens in front of the negative—at least so far as this country is concerned.

The ivorytypes, as painted by Mr. Wenderoth, are always in demand, and compel a degree of application to his brush not at all conducive to his good health. He has a great number of assistants in the painting-room, but the large work he does himself. His conveniences for heating the glass plates preparatory to cementing the picture to the glass, have resulted from a long series of experiments. Now he lays the largest plates on to his heating apparatus with no fear of causing them to crack by unequal heating.

In one of my first letters to THE BRITISH JOURNAL OF PHOTOGRAPHY I hinted at Dr. Smallwood's photography of snow crystals. A long and interesting letter from that gentleman relates how, in the biting cold of a Canadian winter, he has, year after year, watched these perfect crystals as they fall—the thermometer twenty degrees below zero. The tiny gems are caught on black velvet, and in this intense cold are transferred to the microscope. Here certain definite forms show themselves. These forms being of two general shapes—one always present when the electric condition of the atmosphere was positive, while the other form as uniformly present in a negative state of the air—the fact of the electric condition differing with the form of the crystals he proved through many years' experiments. I have seen photographs made by him directly from the crystals in that coldest of cold climates, and he deserves great credit for his experiments in that direction. It may be interesting to some of your readers to know that in his experiments to determine the electric condition of the atmosphere, he demonstrated what the following extract from his letter will explain:—"You must remember that *snow flakes* do not possess any regularity of form, nor do they give rise to any electrical (atmospheric) phenomena; while, on the contrary, the *snow crystals* possess mathematical nicety, and the electric phenomena are of a very intense kind, sparks often passing from the conductor to the receiver, of one inch or more in length, for hours during our winter snow-storms—the thermometer often ten to twenty degrees below zero."

Mr. John R. Gilliss, of the Naval Observatory, Washington, has just completed his diffraction apparatus. He describes it as "consisting mainly of a heliostat with a lens 18 inches focus, showing the sun's image on apertures in a thin metal plate. From the camera only an intensely bright point or line will be seen ($\frac{1}{10}$ inch 25 feet off I will generally use), in the centre of a blackened disc of wood 18-inch diameter, shaded by a projecting rim of pasteboard. A telescope 18 inches focus, mounted as an altitude, and azimuth instrument, with a shade in front adapted to receive slides with the apertures, is used in forming the images. The images can be received either directly on the collodion or magnified to any amount before entering the camera. The camera is a small one made for the purpose (quarter-plate). It can be put at any distance from the telescope, and the two clamped at any angle of elevation. Instead of the diffraction shade one may be substituted with a prism for Fraunhofer's lines." He is also engaged making copies from a set of original drawings and models, by Mr. Engel, of caustic curve wave surfaces in crystals. This collection is the result of many years' labour, and hitherto not copied.

When I commenced this letter I had in view the description of several mechanical adjuncts to photography; but, after writing a few words about patent clothes-pins and wringing machines, I dropped the subject without describing a punch for cutting out proofs ready for mounting which has been introduced into some of our best galleries. In this little machine the punch is forced up from below through the die-plate, which is on top. These die-plates are made for cutting ovals 6 × 8 inches, squares for card pictures, and other shapes. The prints are placed under the die-plate face up, and adjusted to position, the whole picture being in sight. A quick motion of a lever below forces up the punch, cutting the print with neatness and despatch. The same instrument has been used for cutting out bank-notes.

There are three descriptions of cameras for taking card pictures:—1st. Those having two ordinary quarter-size lenses: the holder to these is adapted to 6½ × 8½ inch plates, and the holder slides vertically, making the pictures first on one end and then the other of the plate. 2nd. Those having two half-size lenses, placed one over the other: the holder is also arranged for 6½ × 8½ inch plates, but it slides sideways, and the pictures thus made cannot be mounted as stereographs. 3rd. By far the best arrangement is to have four lenses made especially for this kind of picture, and of exactly the same focus. The lenses are set back in the box, and there is a door to shut in front of all of them at once. The camera has a screw focussing adjustment, and the glass used is about 8 × 14 inches. The holder slides sideways, and there are eight negatives made at one sitting.

While speaking of cameras it would be well to mention that bellows boxes for stereoscopic cameras are made very light and portable. In order to have them shut up close, the separating partition is made of black ribbed silk, which winds itself upon a roller by a watch-spring arrangement on the front of the box, just as spring tape line measures are arranged. I mention these various contrivances—not claiming them as anything peculiar to this country, but as a mere statement of facts, and to enable my readers to fully understand how we work here.

A photographer from New York State, who has been for some time driving a brisk business at the camps below Washington, sends some good stereographs taken in that neighbourhood, and says that the soldiers are very good customers as long as their money holds out. His work with ambrotypes alone yielded him about fifty dollars each day.

The trade in card-pictures is increasing rapidly, and now there is a large demand for small copies of engravings, some large establishments being engaged exclusively on this class of work. It would not do to end a dry letter with anything about dry plates, so, with due regard, I subscribe myself

COLEMAN SELLERS.

Scraps and Fragments.

PHOTO-PAPYROGRAPHY.—The annual report of the Government Topographical Department states that it is intended to copy, by means of Colonel Sir Henry James's process of photo-papyrography, the despatches in cipher deposited in the royal archives of Simancas, in Spain. These despatches are likely to prove remarkably interesting, relating, as they are supposed to do, to important events of the time of Queen Elizabeth. Specimens of the above process have been recently placed in the libraries of the Houses of Lords and Commons.

VARNISH FOR NEGATIVES.—Several photographers have recently spoken very highly of the "white hard varnish," as being, when largely diluted with spirits of wine, one of the very best varnishes for negatives. Hearing that in very many places this varnish—usually sold at about a shilling or less the pint—cannot be procured, we give the following description of its composition obtained direct from a manufacturer. Take one gallon of spirits of wine, two pounds of gum-sandarach, half a pound of gum-mastic, and two ounces of gum-anima; mix in a clean vessel, dissolve slowly with heat, shaking it frequently. When the gums are dissolved, strain the varnish, and it is fit for use. For photographic purposes fully twice this quantity of spirits of wine may be used.

FINE ARTS' COPYRIGHT.—The Bill by which protection for photographs is proposed to be afforded, has been referred to a select Committee of the House of Lords—a proceeding by which we fear delay, at least, may be apprehended as regards its passing into a law; perhaps even a total discomfiture of the advocates of the measure. We understand that Lord Overstone spent some time lately in Mr. Heath's studio, making himself acquainted with the details of photographic manipulation. We wish that some half-dozen of our best landscape photographers would agree to take negatives of the same subject—say, for instance, Buckingham Palace—and send a proof from each negative to be laid before the select Committee: this, we fancy, would convince the sceptical that the artist's individuality is sufficiently impressed on his works.

VIEWING STEREOGRAPHS WITHOUT STEREOSCOPES.—The following scrap is from *Humphrey's* (American) *Journal:*—"Only *one* point, the serio-comical one, I will take the liberty of 'controversing' here, and Sellers will laugh with us. I refer to '*the foolish abuse of the eyes,*' as this simple sentence may deter some from trying the experiment. Of course it will injure the legs of the babies to make them stand up straight before they have got bones. But it will *not* injure the eyes of people who have got their little Charlies, or Horaces, or Colemans (nor other old folks or fogies who have *not* got any such), when they try to see stereoscopically and afterwards practise it, more than it will injure the ankles of ladies in trying to learn skating, or the fourth and fifth finger of a piano pupil in learning to trill with them, or the neck of a young fresco-painter at work on a ceiling, or the arms of a pharmaceutical tyro in mixing the *unguentum mercurialis!* No matter how they cry, 'It pains! it pains!'—Respectfully yours, "CARL MEINERTH."

THE EXHIBITION OF SKETCHES FROM "PUNCH."—The simple process by which Mr. John Leech has enlarged his celebrated sketches may be a very ingenious one, but its adoption must be a matter of surprise to all photographers. The critics generally seem to think the printing from the original blocks upon elastic plates, which are then stretched equally in every direction until the sketch is five times its original size, must make each of them, as the *Morning Herald* states, "a faithful repetition of the illustration as it appeared in *Punch*;" but we think if the Editor of the *Morning Herald* were himself subjected to a similar process of enlargement, it is very probable that he would thus become an unknown, although a very remarkable, personage, even to his own most respected progenitor. A comparison of these sketches, (tinted in oil by Mr. Leech), with the originals in *Punch*, will show that the former owe more to the after-touch of the artist than to the enlarging process he adopted, which must, from its very nature, be depreciative of the vigour, spirit, and character of the originals. To adopt such a bungling expedient for enlarging when the work could have been done most thoroughly and effectually by the more sure, economical, and equally simple photographic process, is a blunder which we did think our very talented and popular designer could not have committed. The Exhibition, however, is one of the best, and will, doubtless, prove one of the most attractive, in the metropolis.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—In reference to the letter of Mr. Hornby, published in your last number, I beg to say that it does not appear either to require any reply at my hands, or to have disturbed any point in a previous letter of mine to which it refers. There is indeed one novelty in Mr. H.'s letter, viz., the comparing of an optical truth to "stinking fish:" the former of these is much more to my taste to digest than the latter. Instead of taking Mr. H.'s letter to pieces, I conclude it is much better preserved as a whole—

"To all an example—to no one a pattern."

In reference to Mr. Dallmeyer's letter, I think its tone is adequate to show that had I not been somewhat *brusque* in announcing my dissent, it had a good chance of being passed by as unworthy of notice. I have, therefore, dealt *honestly*, if not complimentarily, with him, and I reserved my final judgment for his reply. His letter has by no means dissipated the "blunder," and I refer to my article on "displacement," &c. (written for insertion in your present number), as indicating on whose side the error lies. Mr. D. has no right to require of me to prove that my lens has *no* distortion until he can show that in some one instance, at least, I have said so (which I never have, but have constantly asserted the contrary). When I have stated that it has less distortion than the ordinary single combination, I have done so partly from my own deductions, and partly from the observations of others, including Mr. Bedford.

Instead of proving his case, Mr. Dallmeyer has introduced some irrelevant matters. I believe it will be conceded that the judgment of a *dis*interested party is to be preferred to that of a highly-interested one, and I desire to place in juxtaposition with Mr. D.'s examination of the aplanatic lens a single extract from one of the many communications I have received respecting the aplanatic; and when I mention that the writer is Mr. Bedford I shall have said enough as to his capability of judgment and previous experience with other lenses. Mr. Bedford, just before proceeding on a photographic excursion, in 1858, for taking negatives of 12 × 10, was by my then agent lent one of the first half-dozen 3-inch aplanatics sent to London for sale; and on Feb. 2, 1859, he wrote me as follows:—

"I had the opportunity of testing its capabilities during a photographic excursion to Tintern and Raglan, and with it I worked to my *own* very great advantage, and with so much satisfaction, that although I had two other lenses with me, I do not think that I used them on more than one occasion. Your lens, although made to cover only 10 × 8, answered perfectly for plates 12 × 10, as the specimens I shall send you will show; and I considered it a great advantage to get so great an angle as its short focal length gave me, while there is certainly much less bending of the lines, and consequently less distortion than I have hitherto been accustomed to meet with. I was able, too, to work always with the medium stop, even on pictures 12 × 10, which enabled me to shorten the time of exposure."

There is one more paragraph of Mr. D.'s letter which I would here allude to. He informs (?) us that if, for the purpose of covering a large field, the stop be approached nearer to the lens than the previous (or best distance) the lateral pencils will suffer in distinctness. Had Mr. D. referred to the price list of the aplanatic lenses, he might have seen that the instructions there given relative to the stop are based upon that fact; but with that fact I here desire to couple another, which I intend shortly to show in that manner which I admit to be the most satisfactory—that is, by actual "results," and with a simple mention of which I shall conclude—viz., that if a triplet and an aplanatic of the same focus be charged with stops of equal size, and the stop of the aplanatic be approached to *half its best distance* from the lens, the aplanatic will be, in such case, a quicker acting lens, cover a much larger field, and still retain greater distinctness (in corresponding lateral pencils) than the triplet.—I am, yours, &c.,

Dublin, June 6, 1862. THOMAS GRUBB.

ACARI IN THE NITRATE BATH.

To the EDITOR.

SIR,—The interest evinced by the members at the meeting of the Microscopical Society on the subject of the *Acari* found in my collodion nitrate bath, and reported in your last number, induces me to offer the following remarks, not for the purpose of raising any controversy, but to assist the little word "on," and the answer kindly made by yourself to the objections against its employment. By this word I meant that the insects were all seen on the surface of the fluid in the bath when looking down into it: of course I could not there further examine them, as the glass was covered outside with asphalte varnish. When removed and placed on water, and examined through a lens, looking across its surface, the body appeared to rest on the fluid, while the mouth apparatus *dipped into the same.* I looked in vain for a bubble of air by which they might be buoyed up. The floating seemed to depend on the feathery and spring hairs of the body and legs. When soaked six days in water, the insects gave unmistakeable signs of the presence of silver, upon removal to water.

after their immersion in solution of iodine in iodide of potassium. I cannot indisputably say where this came from; but I imagine, from the ordinary position of the head, and the change of colour when placed in the iodide solution, that the bodies were saturated with a salt of silver, Whether or not the general finely-granular appearance was occasioned by the solution of any salt of silver drying on their surfaces—and this would imply contact, even, say by capillary attraction, with its solution—I cannot state; or whether they rose from the bottom of the fluid—imprisoned in air, as suggested by Mr. Wenham might be the case in Mr. Cross's *Acari*—I cannot contradict. Yet there appears some difficulty with those having the *ovum* suspended from the pouch, of which you have a photograph, unless we suppose the parent to have remained incased with its extruded *ovum*—an opinion perhaps hardly tenable.

If they did not enjoy their *bath*, and were not really in contact with it, could they have thrown out any defensive exudation from their fatty sarcode bodies which could have decomposed the nitrate of silver and precipitated it inert on their surfaces? From all the insects being found together—none on the sides of the bath—we can, I think, hardly suppose that their food could have been the under paper cover to the vertical bath, unless they all fed at once or at fixed times. The powerful mandibles may have been, under the circumstances in which they were found, of scarce more real use than the horns of a tame cow.

Again: the mixed vapours emanating from an often-used collodion nitrate bath we should suppose not the most favourable for the well-being of insect life. The bath was in good condition, as tested by the photographs sent; so what they fed on remains—unless we adopt the solution as affording the supply—an enigma.

In the edition for 1844 of *Noad's Lectures on Electricity* I find an excellent account of the experiments conducted by the late Mr. Cross, which led to the discovery of the *Acarus Crossi*, and an engraving of the animal. In the appendix is a notice of the results obtained by Mr. Weekes and also by Mr. Noad when attempting similar experiments.

In the first experiment the solution consisted of soluble glass supersaturated with hydrochloric acid. In subsequent ones the *Acarus* made "its appearance in electrified solutions of nitrate and sulphate of copper, sulphates of iron and zinc, also on the wires attached to the poles of a battery working in a concentrated solution of silicate of potassa, also in fluo-silicic acid, appearing on the naked platinum wire at the bottom of the quartz in the glass basin at the negative pole." In the Appendix we are led to suppose the agency of electricity to be necessary to the production of the *Acarus Crossi*. In the case to which the above remarks allude we are, to the best of my belief, divested of its agency. It will, I fear, be impossible to clear up the doubtful points: some may contend for one thing, some for another, hence it perhaps will be best to take Solomon's advice, and "leave off contention before it be meddled with."
—I am, yours, &c., R. L. MADDOX, M.D.

Woolston, June 6th, 1862.

PHOTO-MICROGRAPHS.

To the EDITOR.

SIR,—Trusting you will not deem me troublesome, I beg to ask your acceptance of the few photo-micrographs enclosed, and which I have just done. A very curious effect is apparent upon two of them, which I have attempted to explain away in the enclosed note, viz., that both the *Coscinodiscus* and *Arachnoidiscus* projected images of their markings upon a portion of the film absolutely in darkness. Will you kindly say whether you think my theory correct or not?—I am, yours, &c.,

Kentish Town, N.W. June 6th, 1862. JOHN BOCKETT.

A SINGULAR EFFECT OBSERVED IN PHOTO-MICROGRAPHS.

IN the June number of the *Intellectual Observer* there is an extract from an American scientific paper *Silliman's Journal*, for January, 1862, giving some remarks tending to define the nature of the exquisite markings shown with high power object-glasses upon most of the *Diatomaceæ;* whereby it would seem that their surface is covered with depressions or cavities, and that the cause of uncertainty as to their nature arise from the facts that most of them as set up for microscopical slides are mounted in Canada balsam, which possessing a certain refractive power has the property of transforming each cavity into (for the time being) a lens. This is very apparent when the *Triceratrium, Isthmia, Coscinodiscus*, and some other larger species, are examined, with a good glass, evidently the hexagonal depressions being filled up with some portion of substance of which the entire specimen is composed, and that again, even if I may use the word, submarked. The foregoing was very forcibly illustrated upon photographing some of these species of objects last week—the apparatus being formed of a very ordinary student's instrument, the diameter of the body being only one and a quarter inches, and the disc projected upon the film being about three and a quarter inches. Now, when focussing a slide of *Arachnoidiscus*, and also the *Coscinodiscus*, although the circumference of the field distinctly divided some of the *Diatom* discs, I was surprised to find that in all the cases where the division took place that the object itself had projected its own speciality beyond the field. From this, is it fair to assume that the quasi lenses formed by the cavities filled with balsam refracted and projected the rays of light received from the mirror upon a portion of the film absolutely in darkness, seeing that the field excluded those parts which are clearly depicted upon the film? If such be the case, it would go far to prove that the markings upon the *Diatomaceæ* are cavities and not perforations, and that the cavities exhibited upon certain seeds offer an analogy to similar cavities on the *Diatoms*—with this exception, that in the one they are formed upon an opaque body (the seeds for example), and in the other upon a substance nearly as transparent as glass. Should such prove to be the case it would afford another proof of the good that may be arrived at by means of photo-micrography.

Collodion employed, Mawson's negative, one month old; developer, iron and citric acid, intensified with silver; fixed, hypo.; exposure, one second (using the sun). The tube of the microscope was lined throughout with card-board, blackened with Hughes's dead-black varnish.

[Four specimens (magnified about 200 diameters) accompanied the preceding note, viz.:—*Transverse Section of Rush, Biddulphia Pulchella, Arachnoidiscus, Coscinodiscus;* but, with the exception of the first, and a small portion of the last-named, they are, in our judgment, not in *chemical focus*—the portion of the valve of *Coscinodiscus* at the upper part of the picture being pretty well defined, but all the other *Diatoms* more or less indistinct.

We do not think our correspondent is correct in his theory—indeed, we do not perceive the possibility of a lens of any kind, located some eight or ten inches from an obstruction (the microscope tube), refracting rays of light, as it were, "round a corner" so distant therefrom. It appears to us that the definition being apparent in what Mr. Bockett imagined to be "absolute darkness," is really in the penumbral portion of the field, that had he viewed it a little obliquely he would probably have been able to see the image on the focussing-screen; but, what is of more importance in our judgment is, that the better definition being at the margin of the field, and consequently *at a greater distance from the lens* than the central part of the field—knowing, also, that microscopic objectives are usually slightly over-corrected—it indicates that he would have produced better defined photographs had he made a little more allowance for correction of focus, by withdrawing the plate a shade further off, or by turning the "fine adjustment" a division or two more so as to withdraw the objective a shade further from the object.

The paper cited contains an ingenious hypothesis, but capable of being explained otherwise in one particular. We had it in contemplation to have discussed the same at the Microscopical Society, but we chanced to take the paper to the annual meeting, when none but formal business is transacted prior to receiving the President's address.]

ANACTINIC SILK.

To the EDITOR.

SIR,—I herewith beg to enclose a second sample of my prepared silk. It is the same in principle as, but prepared by a method which renders it more homogeneous than, the first sort, and I think it will therefore be preferable. The print enclosed is from the negative I mentioned in my former note. By it you will see that the only portions of no action are the ones covered with the new silk.—I am, yours, &c.

2, *Canterbury Terrace, Beresford Street,* C. W. SMARTT.
Walworth, S., June 4th, 1862.

[The specimen of silk received is of a deep orange colour, homogeneous in appearance, and the protective action on chloride paper appears to be perfect, which is not the case with old yellow silk, yellow tammy, glass, &c.—ED.]

PHOTOGRAPHY AND "ALL THE YEAR ROUND."

To the EDITOR.

SIR,—Not long since, a majestic, strong-minded female, at the head of a train of giggling misses, sailed in full swell of crinoline into my reception-room; and, after making arrangements for the taking of all their several *cartes de visite*, began to tutor me as to how I should pose and light, particularly insisting upon the blinds being drawn so as to exclude all light from entering at the top of my glass-room, and the greater part from entering at the sides. In vain I argued that all the force and effect of a portrait depended upon a judicious proportion of top light; and strove to show that the kind of light she desired could neither give relief to the features nor secure roundness in the head and figure. My arguments were treated with quiet scorn; my ignorance very palpably insinuated; and, at length, by way of an incontrovertable clencher, the resolute dame acknowledged that she was indebted for her conclusions to the authority whose impertinent assertion that photographic portraitists (always excepting M. Silvy) "do not yet quite understand their trade" was quoted in your last. It is a great pity that the shoemaker will go beyond his last; and I for one thank you, Mr. Editor, for calling attention to the folly and presumption embodied in the otherwise very amusing and cleverly-written article on "The Carte de Visite," which appeared in *All the Year Round*.—I am, yours, &c., A BAYSWATER PHOTOGRAPHER.

MANIPULATION.

To the EDITOR.

SIR,—I have just received your last issue, and in it your answers to my inquiries. With regard to the fifth answer I am still in doubt, for I am very careful in the washing of the prints. I give the three changes of water, and out of the last, which is perfectly clear, I put them into salt and water, about one tea-spoonful of salt to one quart of water, and allow them to remain in that for eight or ten minutes; then remove them

into clean water, out of which I put them into the alkaline toning bath, each print separately. The moment they are put into it the stains appear and remain unchanged. The fixing bath is one ounce of hypo. to five ounces of water.

Again: what must the tincture of iodine be diluted with?

In your answer to "P. W.," page 222, you seem to condemn the use of methylated spirits in the developer for positives. Is it also bad for negatives?—I am, yours, &c., E. B.

June 2nd, 1862.

[Certainly the prints received were affected by photographic *measles*, but this effect cannot have arisen before they came in contact with the hyposulphite of soda: you must therefore allude to some other stains than those we noticed. Perhaps you hung them up to drip with clips that had previously come in contact with hyposulphite of soda solution.

Tincture of iodine should be diluted with alcohol.

The objection to methylated spirit in the developer does not apply to negatives: its action is to degrade the brilliancy of the lights in a positive, hence the reason for avoiding it.—Ed.]

REDUCING SILVER.

To the Editor.

Sir,—In reply to your correspondent, I beg to state that the method of precipitating silver from a caustic solution by grape sugar affords a *perfectly* pure metal: but this is of course assuming that no organic matter is held mechanically in the fluid from which it is to be obtained. If there be such extraneous matter, it must be separated by filtration, or the metal subsequently fused. Under any circumstances, however, it will be prudent to calcine it; being in a finely-divided state, it is soluble immediately in nitric acid.

You have warned your correspondent that a solution may be alkaline without being caustic. I may add, for the information of those who may not be aware of it, that the soda spoken of is not that which is commonly used in photography, and which is a carbonate, but that which is sold as *caustic* soda: of course caustic potash will answer equally well.

Manchester, June 10, 1862. I am, yours, &c., WM. TUDOR MABLEY.

CITY OF GLASGOW AND WEST OF SCOTLAND PHOTOGRAPHIC SOCIETY.

To the Editor.

Sir,—You will no doubt be sorry to learn that, in consequence of the incompatibility of certain members, it has been found necessary to dissolve the City of Glasgow and West of Scotland Photographic Society. I therefore think it right to inform you (lest any of your readers should imagine that interest in the photographic art had died out in this quarter) that a committee of gentlemen have already been appointed, with a view to the formation of a new society, on a more comprehensive basis, wherein the progress of the art may be studied and discussed with forbearance and self-respect. I trust the constitution of the new society will be officially announced to you very shortly. In the meantime, I am sure the gentlemen engaged in its formation will be glad of the assistance and co-operation of all earnest photographers in this part of the country.—I am, yours, &c.,

Glasgow, May 30, 1862. EDMOND BRACE.

ARTISTIC BACKGROUNDS.

To the Editor.

Sir,—In a recent number of your Journal we find some criticisms in an article entitled "Exhibition Gossip," in which some unjust and unjustifiable remarks are made on our artistic backgrounds.

On looking for the name of the writer of the article, we were somewhat surprised to find the name of a gentleman who advertises similar backgrounds to our own in your Journal.

We would simply ask Mr. Wall if he thinks it fair or in good taste to avail himself of the opportunity which his position as a contributor gives him of decrying the productions of others engaged in the same line as himself; and we would ask you, Sir, if you think it fair or in good taste to allow any contributor who thus advertises to abuse unjustly our productions, and thereby, by implication, praise his own.

As regards our backgrounds and accessories, we will simply say they are used and praised by many photographers of higher artistic reputation than Mr. Wall, and have been commended both by your own and other journals.—We are, yours, &c., J. T. & G. BULL.

54, *Great Queen Street, Lincoln's Inn Fields,*
London, W.C., 5th June, 1862.

[We rarely read the particulars of advertisements in our own or contemporary columns, and were not aware that Mr. Wall advertised as indicated by our present correspondents, or we should most certainly have excluded the remarks of which the latter complain. The name of the writer was a guarantee of his good faith, and the estimate was only that of his individual opinion, which, but for the circumstance now first brought under our notice, there was no valid reason for suppressing. We admit that he committed an *error* as regards *good taste* in this matter.

The private letter in which the preceding was enclosed, and which we received from the Publisher, has no special address, either to the Publisher or Editor; but it is couched in such peremptory language that it would certainly have *ensured the rejection* of the enclosure, but that we prefer fairness and justice to other considerations: this is the sole ground upon which we accord it admission.—Ed.]

ANSWERS TO CORRESPONDENTS.

☞ We regret that want of space unavoidably compels us to omit the letter of "Inexperience," and a variety of other matter.

J. G. F.—Received.

Fred. B.—We will inquire for you.

Hypo.—About one ounce to four of water.

O. E.—Flattened crown or patent plate glass we prefer to sheet.

C A. F.—We do not perceive any advantage in what you propose.

True Blue.—We will assist you willingly by advice, if you state your case.

J. S.—We have not received the letter to which you refer as having been sent last month.

Cedo Nulli.—We shall be happy to lay the matter before our readers, if you will afford us the means of so doing.

C. R.—We imagine that your lack of intensity is owing to an insufficient quantity of nitrate of silver with your developer.

Querist.—Your lights are too white and your shadows too black, indicating under-exposure and over-development of the negative.

S. M.—You will find Mr. England's article in the current volume, No. 164, page 143. The details are too elaborate for repetition.

R. S. M.—Your cyanide solution is much too strong, hence the destruction of your half-tones. Add twice the quantity of water to your solution.

William Read.—We prefer old collodion for cleaning glass plates to any other material. See report of the last meeting of the North London Photographic Association.

Homo.—Count Montizon took excellent negatives of many of the animals in the Zoological Gardens several years ago. We possess a proof of the hippopotamus taken by him.

D. C.—Put the necessary quantity of pyroxyline first into a clean bottle, then add the alcohol, and lastly the ether: you will find this render the pyroxyline most readily soluble.

Tyro.—You have pushed the development too far, hence the snowy effect of which you complain; the details are all present, so that but for your over anxiety to attain density, you would have done well enough.

Printer.—Certainly we approve the use of a pretty warm iron to smooth the finished proofs: if by any chance the toning is partly due to sulphur, we believe the hot iron gives the print a better chance of stability.

X.—1. A single combination is not adapted for portraiture. 2. A square camera for the operating-room is most convenient, as it allows the plate to be exposed either horizontally or perpendicularly without turning the camera.

Reginald A.—We really cannot advise which folding camera you had better choose, for we regard all folding ones as objectionable except for very large plates; and there is no end of trouble in putting them up and taking them down.

F. Jones.—Your queries are so very elementary that it is evident you know next to nothing of photography. Buy any of the cheap manuals and you will find replies to every one: if you then are in difficulty about details we will try and help you.

Lucy.—We do not think you would have much chance of employment as an operator, however well you may manipulate. There is a prejudice (if such it be) against ladies being engaged in that capacity. As a printer you have more chance, the feeling being quite in your favour.

W. M. (Sheffield.)—Under-exposure and over-development are the causes of the snowy appearance both in and out of the stereoscope. Probably you would succeed better by using the developer a little warm—say about 80°. Add but little silver solution to commence with, and do not mind spending time over the operation.

Verdant Green.—1. Render the bath *slightly* alkaline by the addition of *liquid ammoniæ*, then drop in solution of citric acid, and shake up. A precipitate will be formed, and the solution gradually become colourless. When this is the case the operation is complete.—2. See Mr. England's paper in our issue for 15th April last.

Conway.—Your lenses are good, and the distance between them correct. There is not much amiss, either, with your negatives; but the printing is somewhat deficient: you had better use a stronger silver solution for exciting your paper. The chief thing wanting to improve your negatives is a little sunshine to throw effective shadows. One of them you have over-intensified, and it is probable that no after intensification was needful. It often happens that a negative is dense enough after development with the iron solution alone; but when you use pyrogallic acid to add to the density, use *double* the quantity of acetic acid to that you at present employ.

Sambo.—We know very little (in fact, scarcely anything) about the *commercial* part of photography—nothing about amount of salaries given to operators; but we do know that good operators are at present in demand both in London and the provinces. You had better advertise in the photographic journals, and perhaps also in the *Athenæum*. Your specimens evince considerable ability; but there is plenty of room for improvement. The printing is commendable: the negatives are, however, generally rather "hard"—Nos. 8 and 10 especially. Your pseudo-negro friend (the standing figure) is the best of your specimens, both as regards pose and manipulation. No. 4 is harmonious in tone, and, but for being too full-faced, fairly posed: the head of the child is also rather too near to that of the lady. Nos. 6 and 9 are soft and good; No. 11 is awkwardly arranged—all of a heap in one corner; No. 7 is very stiff, and the table on which the microscope stands much too small. We see no reason why you should not get an engagement: many worse operators than yourself obtain employment.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 169, Vol. IX.—JULY 1, 1862.

On the Means of Effecting Instantaneous Exposure.—In the preparation of films of collodion for instantaneous delineation, the very exalted sensitiveness already attained to, and the reasonable hope that still further advances will be made in this direction, enhance the importance of adopting some contrivance for ensuring rapid exposure of the plate. The mere removal by hand of a cover of any kind from the lens, and then quickly replacing it, occupies far too much time for our purpose. Objects in motion, especially when at but a short distance from the camera, are apt to be blurred in outline, if not altogether indistinguishable, from deficiency of definition, if attempted to be photographed in this manner. The same may be said of arrangements by which a shutter in front of the lens is opened and closed by hand; in fact, there are some subjects which have of late been depicted in which crowds of people and vehicles in active movement have formed a prominent feature, but in accomplishing which many failures had first to be submitted to, chiefly in consequence of the absence of a perfect arrangement for effecting rapid exposure. A little consideration devoted to this subject may therefore prove profitable to many of our readers, especially at the present time.

Such a contrivance as we have in view should possess certain qualifications. It should be so under control as to be readily brought into action at any desired moment; it should not cause the camera to vibrate, at anyrate before the exposure has been completed; and it should allow the whole of the intended aperture of the lens employed to act as simultaneously as possible, in order that the actual duration of the exposure may be reduced to a minimum. These are the *desiderata*, and if we cannot secure the whole of them we must endeavour to include the most that we are able.

Several arrangements and modifications, more or less ingenious, have from time to time been suggested in the journals, and exhibited at some of the meetings of the various photographic societies; but we do not remember any occasion when the advantages and disadvantages of the various contrivances have been fairly contrasted one with the other. We therefore now propose to do this to some extent. It will probably be found in practice that it will be most convenient to be provided with two distinct arrangements to one camera, in order to meet best the exigencies which may arise—that is to say, one for a short but variable exposure, the other for that of the shortest attainable duration of time coupled with the entire and simultaneous unveiling of the lens.

At the last meeting of the Photographic Society (London), Mr. Dallmeyer exhibited and described a shutter designed by Mr. A. Mann, but our attention was at the time otherwise unavoidably engaged, or we might have made some allusion to the subject in our last issue. We have, however, just perused the descriptive article published in our contemporary, the *Journal of the Photographic Society*, and as it enters somewhat argumentatively into the question we reproduce the bulk of the entire article, as follows:—

DESCRIPTION OF AN INSTANTANEOUS SHUTTER.

By A. Mann, M.A.

The importance of being able to photograph objects by an exposure of a fraction of a second seems to be now so generally appreciated as to render any arguments in its favour altogether superfluous.

It is well known that for the purpose in question, in addition to very sensitive chemical preparations, it is important to have a lens capable of being used with a large aperture, so as to admit a considerable amount of light into the camera in a very limited time. The quick-acting lenses, however, now manufactured by the first English opticians, seem admirably adapted to supply the wants of the photographer in this respect; but it occurred to the writer, some time since, that none of the arrangements used for affording the exposure rendered sufficiently available the advantages which these lenses possess. The most common method of giving what is termed an instantaneous exposure is by removing a plate or some opaque substance from before the lens by lifting it up or drawing it to one side and replacing it as quickly as possible.

A little consideration will show that this does not afford the kind of exposure required for the purpose.

On referring to *fig.* 1, where AB represents an object in front of a double combination lens used with the full aperture, *a b* the

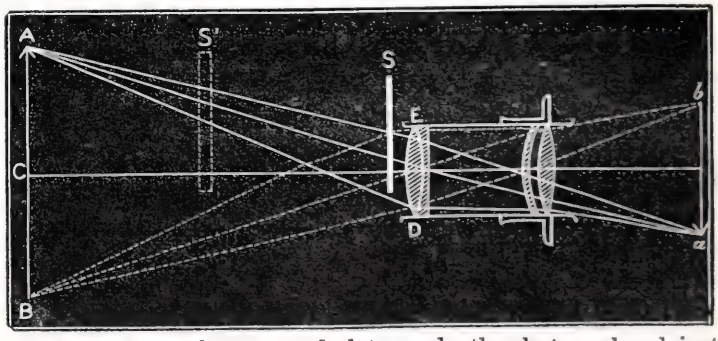


image formed on the prepared plate, and *s* the shutter placed just in front of the lens, it will be seen that as soon as the shutter begins to rise and uncovers the edge of the lens, as represented in the figure at D, part of the rays forming the edges of the pencils emanating both from A and B will enter the lens and be refracted to a focus at *a* and *b* respectively. The same will be the case with the pencils of rays emanating from all intermediate parts of AB; so that, as soon as the shutter begins to rise, an image is formed over the entire plate, very feeble at first and confused by the diffraction suffered by the rays in passing through the narrow opening, but gradually getting brighter until the lens is entirely uncovered, when the illumination reaches the maximum. This, however, is no sooner attained than the shutter must again begin to descend, gradually cutting off the light, and, on its approaching the edge of the lens, again causing indistinctness in the image by diffraction. In this way, instead of the requisite amount of light being admitted in the least possible time, a prolonged partial exposure is obtained. But it is also well known that the effect of

an exposure of this kind upon a sensitive plate is different from that produced by the same amount of light admitted in a much shorter time. In the latter case the tendency is to produce an intense and vigorous negative, but in the former a flat and feeble one; and want of intensity is one of the chief difficulties to be contended with in the prosecution of instantaneous photography. These causes, it is true, can only exert an influence for a very short time; but as that is all the time allowed for the formation of the latent image, it becomes a matter of importance to attend to them. If the shutter be removed to some distance in front of the lens, as indicated at *s'* in the figure, an excess of exposure may be given to the foreground of a landscape; but the same objection applies as before for rapid work, since the field of a view will be longer in being entirely cleared. These remarks apply principally to the use of double combination lenses with the stop in a central position, such being now universally used for quick work.

With a view to the obviating of these disadvantages, the writer contrived the new shutter the properties of which he is now about to describe. This consists essentially of two opaque plates or membranes (both being used), provided with rectangular openings at a distance from each other equal to that between the lenses. These plates are so placed that each covers up one-half of the lens, and the exposure is afforded by their moving simultaneously in opposite directions in a plane at right angles to the axes of the lenses, which are thus uncovered from the centre outwards, and again covered up from the edges toward the centre, by the plates still moving onward. In this way the principal part of the lens remains uncovered from first to last, thereby affording nearly the maximum illumination to the image during the whole time of exposure.

The difference between the amount of light admitted into the camera during an instantaneous exposure by this contrivance, and that admitted by the ordinary one, will become more apparent on comparing the amount which will pass through one-half of a lens when uncovered by a plate sliding from the centre towards the edge, and from the edge towards the centre respectively. Now, as the amount of light admitted in any case must be proportional to the area of the lens exposed, and also to the time it remains exposed, it will be proportional to the product of these. If the respective amounts of light admitted into the camera in these two cases be calculated by the application of mathematical formulæ, they will be found to be very nearly in the proportion of three to two; and since even in the most perfect lenses the margin is of less value than an equal area at the centre, we shall not be guilty of any exaggeration at least in adhering to these numbers.

In uncovering the lens by the new shutter above described, one limb will descend during the time (supposing the exposure be of the same duration in both cases) in which the single shutter rises, and the amount of light admitted by it in that time will be represented by three, compared with that admitted by the single shutter as two; but during the same time the other limb will have moved up and admitted the same amount of light through the other half of the lens, so that by the time the single shutter will have uncovered one-half of the lens the other will have uncovered the whole of it, and have admitted thrice as much light in that time. In this way three times as much light will be admitted into the camera during one half of the time of exposure, and during the other half the lens remains entirely uncovered, while with the ordinary shutter the amount of the lens uncovered during that period varies between the half and the whole surface. Combining these two, and taking into account the close proximity of the new shutter to the lens, the respective amounts of light admitted in the two cases during the exposure will be found to be about as two to one.

If, instead of in front of or behind the lenses, the arrangement be placed in a central position between them, the advantages which will arise from its use are still more apparent when a stop is used. Take, for instance, the case of these instantaneous views of Paris, which were taken by Dallmeyer's compound stereoscopic lenses with a half-inch stop. Here the whole field of view would have been cleared by the time each plate had moved a quarter of an inch, while a single plate in front would have to move through a space of about two inches.

Before constructing this shutter, the writer had recourse to a contrivance placed inside the camera, immediately in front of the dark slide, which, by pulling a cord, caused a longitudinal aperture to descend in front of the prepared plate and permitted the maximum power of the lens to act upon the various parts of it in succession for a very short time. There are disadvantages, however, attending the use of this contrivance which render it available for instantaneous pictures only, and but for a certain class even of these. Suppose, for instance, that this slit be an inch in depth and the plate four inches, then each portion of the plate will be uncovered only one-fourth of the whole time of exposure; and if a large moving object has to be photographed so as to fill up a considerable portion of the picture, some of the parts will continue to move after others have been impressed, which must lead to distortion and indistinctness of the image. In such a case it will be seen that, by the shutter already described, the same amount of exposure may be given in one-third of the time, since all the parts of the image are formed simultaneously. The only circumstance in which this is suitable is for an instantaneous sunlight view, comprising a number of small or distant objects, and where a change in their relative positions is of no importance.

The most important application, however, of quick photography is to subjects which are not necessarily in motion, but very apt to move, and where the exposure need not be altogether what is understood by the term instantaneous, but may last from one to two or three seconds. For this purpose the writer believes the new shutter will be found very well adapted, as it is concealed from view and entirely under the control of the operator, thus enabling him by a gentle touch to uncover all the lenses simultaneously (if he uses more than one) at the proper moment, and, devoting all his attention to the sitter, to cut off the light the instant any motion is perceptible, as a slight deficiency in the exposure may be compensated for to a certain extent in the developing. The shutter may be placed either inside the camera behind the lenses, or outside in front of them, in which position it is provided with a folding hood, which projects considerably in front of the lenses and acts as a shade.

The exposure may be effected in several ways, according to the convenience of the operator. One is by gently pulling a string, which uncovers the lenses by causing the plates to glide in opposite directions; and the light may be shut off by tightening the cord to make them pass onwards, or by allowing them to return to their former position by a retrograde motion. When extreme rapidity is desired, the plates are first drawn into the proper position by tightening the cord, and are at the proper time let loose by touching a small trigger with the finger, when they flash across the lenses and give the requisite amount of exposure. With this arrangement, and sufficiently sensitive preparations, especially with the dry process, the use of a stand might be dispensed with; and if a view-meter were fixed on to the top of the camera, the operator, as soon as a chance presented itself, might take aim and pull the trigger. Some of the peculiarities of this form of shutter, then, are—that it may be applied to one or any number of lenses, is perfectly under control, and affords a convenient mode of uncovering the lenses for ordinary work in the studio. When used for instantaneous work, it will admit about double the amount of light into the camera that the ordinary form will in the same time, or give an equal exposure in about one-half the time; or, in other words, produce equal results in that time on preparations about half as sensitive as those required by the ordinary form. By producing a well-illuminated image during nearly all the time of exposure, it will assist in counteracting the tendency to feebleness, characteristic of instantaneous negatives. When it is desired to give an excess of exposure to the foreground of a picture, it may be done by simply introducing a blackened card in front of the upper half of the lenses during part of the time they remain uncovered. In conclusion, it may not be out of place to mention that the principle here involved is patented, but that the manufacture of the instrument in its various forms has been undertaken by Mr. Dallmeyer, who is now supplying the public with it; and if it be found to meet the wants for which it is intended, the writer will not consider his labours thrown away.

Some of the observations in the foregoing article are sound enough; others may be more or less questionable. Amongst the latter we class the assertion that "the most important application however of quick photography is to subjects which are not necessarily in motion, but very apt to move," especially if it be coupled with any presumed superlative superiority in the shutter described for exposing to subjects of the class indicated. There are, however, many points about it which proclaim its fitness for "instantaneous" work; but we are not convinced that it excels the "guillotine" arrangement for this purpose. In one respect it is certainly inferior, in that the whole effective aperture of the lens is with the former only progressively brought into action, while with the latter the

reverse is the case. In point of fact we have progressive opening of the lens substituted for progressive impression of the image, and we cannot forbear remarking, *en passant*, that we consider Mr. Mann has greatly exaggerated the probable inconvenience likely to arise from the last-named circumstance.

The opening and closing of the lens commencing at the centre instead of at the margin we regard as an important consideration; but it is one that has not been overlooked by other and more early experimentalists than Mr. Mann. To give one instance, we may point to Mr. Skaife's shutters, which have precisely the same advantages as are possessed by those now under consideration, though accomplished by a different course of proceeding. It would be quite practicable to have either Mr. Skaife's *or* Mr. Mann's shutters *and* the "guillotine" shutter both in use with one camera, so as to employ either at will: they are therefore on a par in this particular also.

We have left for the last the consideration of another point of no trifling moment: we allude to that contained in Mr. Mann's concluding paragraph relative to his having *patented the principle* involved in the construction of these shutters—a fact which we regret to learn on more accounts than one.

We have before now taken occasion to complain of the very loose manner in which the granting of letters patent is conducted—a laxity injurious both to the public and to patentees themselves, the former being generally the most injured. In the case before us we believe the patentee to be the victim, for, in addition to the fact that the principle involved (that of the lens being first exposed at its centre) being included in Mr. Skaife's patent, we have other reasons for concluding that the patent is in this instance invalid. On reading Mr. Mann's description we were at once struck with the fact that not only the principle involved in the construction of his shutters had already been applied to the same photographic operation, but that the *form of its application* is almost identical with one brought under the notice of the Photographic Society but a short time after its establishment, between eight and nine years ago. On reference to the *Journal of the Photographic Society*, Vol. I. page 142, published on the 21st December, 1853, we find it recorded in the report of the meeting held on the 1st of the same month that "Mr. Montefiore Levi exhibited and described an instrument for rapidly opening and closing the lens;" and in the following number, published January 21st, 1854, at p. 162, there is a description of the same (signed G. Montefiore Levi), with an illustrative woodcut of the apparatus as applied to one lens. The application of the same to a binocular camera is so manifest a corollary that we presume no one would dream of claiming a patent right for that alone. Even at the time specified—namely, in 1853—the principle of this arrangement had already been applied to the microscope, though not, so far as we are aware, to photographic purposes. In the International Exhibition of 1851, M. Nachet, the well-known optician, of Paris, exhibited a microscope, the stage of which, instead of being furnished with the usual revolving diaphragm-plate, containing apertures of several different sizes, had a diaphragm not revolving, and with but one opening, which was, however, capable of expansion and contraction by merely turning a milled head. At the time specified we had the opportunity of minutely examining one of these ingenious diaphragms in the possession of our friend the late John Queckett, Professor of Histology, and afterwards Curator of the Hunterian Museum in the College of Surgeons, Lincoln's Inn Fields, London.

The diaphragm consisted of two thin plates of blackened metal (each pierced with a rectangular opening), and sliding one over another, the square apertures being placed with their *diagonals* parallel to the line of motion, so that as the plates were moved uniformly in opposite directions, by means of racks and pinion, the centre of the aperture remained in the same spot, while the size of the same was variable at will. We do not mean to contend that the application of this principle to photographic apparatus would have been incapable of being patented; but after its application in this way many years ago, and the publication thereof at the time, we do contend that to have granted a patent recently for the same thing is an injustice to the public and *a misfortune* to the pseudo patentee.

EXPERIMENTAL COMMITTEES.

The time of year having arrived when photographic experimentalists are generally most active, it may not be amiss to offer a few remarks upon experimental committees. There are few documents looked for by the great mass of photographic amateurs with more interest than the "reports" of experimental committees, whether the subject discussed be the qualities of collodion, the excellence of lenses, or an inquiry to ascertain the *best* dry process. At the same time it must be admitted that there are but few, if any, such documents in existence that are not almost universally disappointing. Why this is the case it is by no means difficult to decide, after a little consideration of the ordinary course pursued in the formation and conduct of such commissions as have been from time to time inaugurated by various photographic societies. Avoiding all personality, it may be not unprofitable briefly to pass in review the proceedings of certain committees that have existed within the recollection of most of our readers, with a view to discovering the weakest points, in order that, on some future occasion, when it may be in contemplation to constitute a new one for any special purpose the known "stone of stumbling" may be removed.

Let us commence, then, with the Collodion Committee, which certainly was not lacking in men of photographic experience and skill; neither was that Committee deficient in numbers, nor was there any general want of enthusiasm amongst its members. And yet, of all the reports that have been published, as emanating from experimental committees, that upon collodion not only failed to give satisfaction but produced absolutely more dissatisfaction than any other of its kind. Now, in the first place, we take it that an error was committed in the mode of nomination; and, secondly, in the inconveniently large number of its members. It may be assumed as an axiom that a numerous committee is unwieldy in action, takes much energy to set it in motion at all, and, when it is going, requires still more to keep the several members from straggling, and following "pleas not on the record." In nominating the members of the Collodion Committee, some were evidently included only because others of equal repute were previously appointed, and it was considered invidious to select A, and not B and C. Some at last were proposed—aye appointed—without having been consulted at all about the matter, whether it would be agreeable or whether they would serve. We believe that we are correct in asserting that no general meeting of the Committee ever was held, and no distinct plan of operations agreed upon. What good, then, could be expected from such a haphazard course of proceeding?

With regard to the Scotch Lens Committee, some offence was taken by the opticians, who objected that the committee was self-constituted, and that the efforts of its members were directed chiefly, if not entirely, to the ascertainment of one particular qualification of lenses, to the exclusion of others of equal, if not greater, importance. We are at a loss to perceive the force of the objection that a committee was self-constituted. If the members be able men, it matters but little by whom they are appointed: if not, their decision is but of little value.

More recently, we had in London a Committee for the purpose of ascertaining the *best* dry process. The result of its report—if disappointing to many—was not surprising to us at any rate. Instead of facts we were presented with opinions, and some of them not very decided. We by no means quarrel with this result. Not having been able to arrive at a definite conclusion, it was honest and straightforward of the members to say so. In

this particular case we regard the end proposed as one which offered but small chance of being attained. The *best* dry process is not a very definite term, until we determine in what pre-eminent excellence consists—a matter at present very unsettled in photographic pursuits. Had the inquiry been to ascertain whether any one dry process greatly excelled all others in the beauty and certainty of its results, we apprehend that there would have been no difficulty in finding a distinct and decided verdict—in the negative.

Let us now consider what should be the course to pursue with regard to the appointment of experimental committees, so as to render them effective for the end proposed, viz., the ascertainment of certain facts, and the expression of intelligent opinions founded thereon. Clearly, to this end it is not sufficient that the members should be good operators: they ought especially to possess acuteness of observation, great judgment, and be generally free from prejudice or commercial interest in the inquiry undertaken. As a rule large numbers are fatal to decided results. We would therefore generally confine the number to three: in some special cases perhaps five might be admitted as a maximum. Only those who have proved themselves to be skilled in the subjects of investigation should be chosen, and if they involve questions relating to more than one branch of science a special representative of each should be comprised in the commission. There are some inquiries that demand for their solution a much larger number of working operators than three or even five; but this difficulty is easily met by the expedient of *associate commissioners*. Let the three or five members *specially* selected meet and discuss first of all their intended mode of conducting the inquiry entrusted to them: then let them ask for the assistance of others, if it be needed, to undertake the conduct of such experiments and in such a manner as the chief commissioners may dictate; and let each of the associates make a written report of his share of the work to the chiefs, who, with these reports before them, may compare the results with their own work, and will then probably be in a condition to make a general report that may be well digested and founded upon well-directed investigations—consequently will most likely be of considerable value. In such report each operator should have due credit for his share in the general result; therefore the names of each and every individual who may have taken part in the investigations should be duly recorded. Of course, in many of the questions that might engage the attention of experimental committees the assistance of associates would not be requisite; but the special utility of such an arrangement, when adopted, would be the apportionment of the divisions of labour to those best qualified—not in their own opinions, but in those of others—to perform them. The ascertainment of particular facts by some, of other facts by others; and, what is of at least equal importance, the judicial function would be exercised by those specially endowed with the capacity for correctly determining the relations between cause and effect.

In a comparison between different processes the value of the mode of proceeding that we have been advocating will become at once apparent. Let us suppose a dry process committee to be formed, and to consist of, let us say, Sir Frederick Pollock, Mr. Hardwich, and Mr. Bedford. Having determined upon the various processes to be compared, they would probably request certain gentlemen, advocates of their respective methods of operating, who had proved *by their works* that they did not uphold any particular plan from mere caprice, to operate before them. The various demonstrations would, probably, suggest certain inquiries as to matters of fact, which would be either undertaken personally by some of the members of the committee, or be entrusted to some one or more of the associates to report upon. Now, with such a committee as we have imagined—with the scientific acuteness of Mr. Hardwich and the practical manipulative skill of Mr. Bedford—error of either kind could hardly escape detection; while in the summing up of the evidence, giving each portion its due weight as a preparatory measure to the framing of the report, the experience of the Lord Chief Baron could not fail to be of importance.

Of course, we are not proposing that the particular three gentlemen named should really form a committee. We know that it would be, to say the least, a highly improbable event. But we mention their names as representatives of the classes of persons that we believe it would be judicious to induce to act in combination in such a matter.

We have discussed this question at much greater length than we had intended when commencing it; but we have opened up only a very small portion of the considerations which might profitably be entertained in connexion with it. We cannot avoid thinking that much good might arise from pursuing it further.

SCIENTIFIC PHOTOGRAPHY.

By M. D. Van Monckhoven.

THEORY OF INTENSIFYING NEGATIVES.

There are several methods of intensifying negatives. In one class of operations silver is added to the nitrate adhering to the film, while in the other the high lights of the subject (or blacks of the negative) are made *nuclei* for the reception of new matter. The endeavour will be in these articles to give the theory of both.

Let us first treat of those methods which have been in common use up to the present time.

The greater number of photographers have hitherto employed, in place of pyrogallic acid, a dilute solution of protosulphate of iron. The formula which is generally found most successful is as follows:—

Distilled water	1000 parts.
Sulphate of iron	40 to 50 „
Crystallisable acetic acid	30 „
Sulphuric acid	1 „
Alcohol *or* acetic ether	25 „

The sulphate of iron of commerce, which is generally very impure, should not be used for this purpose, but the recrystallised sulphate, which has a clear brilliant emerald green colour. When, however, any impurity exists, the green is more or less brown, arising from the formation of a sub-persalt.

Many photographers, instead of four or five per cent. of sulphate, diminish this proportion still more, and do not use more than three per cent. This proportion should bear relation to the degree of concentration in the negative nitrate of silver bath. Thus, if the bath contain eight or ten per cent of nitrate, a three-per-cent. solution of sulphate of iron should be used; but if the bath contain no more than six or seven per cent. of nitrate, the solution of protosulphate of iron should be increased to a strength of four or five per cent.

If this developing solution be mixed with a perfectly neutral solution of nitrate of silver, after the lapse of a few minutes the sulphate of protoxide of iron will be found to have appropriated all the oxygen of the nitrate of silver, and the metal will be deposited in the shining metallic state.

The name of "reducing agents" has been given to all those salts which by virtue of their affinity for oxygen reduce the salts of silver to the metallic state. It must not, however, be concluded that all such salts are suitable for developing negatives. We have experimented with the most powerful reducing agents to be found in chemistry—such, for instance, as hypophosphorous acid (P.O.), phosphorous acid ($P O_3$), the protosalts of uranium and titanium, the hydruret of gaïcyle, eugenic acid, and oxyphenic acid. All these salts are not equally successful, and we do not propose to consider their action in this place, although we shall reserve for the pages of The British Journal of Photography the account of the curious experiments we have made with these new reducing agents.

It must no longer be supposed that the substances suitable for developing negatives are necessarily solids. We are about to describe how we have developed with hydruret of gaïcyle (which is a liquid), and still further to show that we have produced a negative by means of a gaseous reducing agent.

The prevailing rule, then, will be found to be this:—Substances having a strong affinity for oxygen reduce the salts of silver to the metallic state, and, as a consequence, develop the latent image produced on iodide of silver by the action of light.

To this, which is one of the fundamental truths of photography, we would invite the reader's best and most thoughtful attention.

The sensitive film consists of iodide of silver, with an excess of the nitrate of the same metal. A very small proportion of iodide in relation to the nitrate is sufficient.

What takes place during the brief moment that the light is acting on the film we know not. It is true that some writers, anxious to give *some* explanation, have pretended that the iodide is decomposed into iodine and metal, or into iodine and sub-iodide of silver; but the truth of this hypothesis must be admitted to be improbable. Others have entertained the opinion, that under the influence of light the iodide acquires a new physical property which enables it to act as a centre of attraction to the molecules of silver set at liberty by the reducing agent, added after the action of light. This hypothesis is much less compromising: it is, in fact, equal to saying "*things are because they are.*"

Were we simply to state all that we really and certainly know on this point, it would be that light produces such a modification on iodide of silver, either physical or chemical, that the iodide being brought into contact with a certain solution depositing metallic silver attracts the metal to those parts where it has been modified.

Furthermore, the deposition of the first molecules of silver takes place with comparative difficulty, but, being once commenced, it proceeds with great rapidity, owing to the attractive power of the *nuclei* first formed; from which it follows that the development, at first slow, increases very rapidly only to be quickly diminished by the weakening of the reducing agent. But if this exhausted developer be replaced by a fresh quantity, after having previously added some nitrate of silver, it continues with new energy.

The iodide of silver, then, which is found in the sensitive film, is but the motive power of photographic action, *the whole of it being found after development.* In one word, it serves only to evoke the action of light; but it is the mixture of the reducing agent and the nitrate which is in excess on the surface of the plate that will constitute the image.

This being admitted, if after a first development it is desired to induce a second, it is found convenient to call this second treatment the "intensifying" of the negative.

For this purpose protosulphate of iron has been in use some years. It is employed in large excess, and in a concentrated solution. By mixture with the nitrate of silver which adheres to the surface of the glass, it reduces *immediately* all the silver to the metallic state. The reaction takes place so rapidly that the molecules of silver set at liberty have not time to arrange themselves upon the light-modified iodide of silver: a small portion only is so deposited, while the remainder floats freely in the liquid.

On diluting the concentrated solution of protosulphate of iron with a large quantity of water, and pouring it over the surface of the glass as it comes from the camera, the silver of the nitrate, instead of being precipitated in one mass as with the concentrated solution, is deposited much more gradually, and the particles arrange themselves for the most part upon the iodide altered by light, and the negative also possesses much greater vigour.

The action being slow, the stopping of it is quite under command, and is effected by immersing the plate in water. On this account, the majority of photographers use protosulphate of iron for developing collodion pictures.

However, the image does not acquire very great vigour. In fact, of whatever strength the solution of protosulphate of iron may be, its action upon the nitrate is nevertheless too vigorous or energetic to admit of the *whole* of the reduced silver being deposited upon the modified iodide. It is not thus with pyrogallic acid: here all the silver is deposited on the modified iodide; also, generally speaking, an image developed with pyrogallic acid has much greater vigour than one developed with protosulphate of iron.

Pyrogallic acid, then, ought to be exclusively employed if the sole consideration in making the choice be the vigour of the negatives. But it is not so. The use of sulphate of iron allows the time of exposure to be reduced one-third, and the subsequent *intensifying* enables the operator to impart great density to the negative.

Other considerations have already been advanced. It seems that the sulphate of iron not only admits of a shorter exposure, but yields a softer picture. We will not, however, enlarge upon this point of detail, which, like many others, would be out of place in this article.

It is then a perfectly established fact that the silver reduced by the action of the sulphate of iron upon the nitrate of silver is deposited upon the modified iodide; and moreover that this silver possesses the property of serving as centres of attraction for new particles, if, after the action of the first reducing agent, a second is brought into contact with the glass. This is called "intensifying the image," as we have already said.

The following is the method of accomplishing this operation. We would, however, observe, parenthetically, that although the method of operating differs almost with every photographer, the theoretical fact upon which it is founded is always the same.

Two solutions are prepared:—

Water	1000 parts.	Water	1000 parts.
Pyrogallic acid	2 „	Nitrate of Silver	50 „
Glacial acetic acid.	40 „		

A small quantity of the pyrogallic acid solution is poured into a developing glass, and to this is added a few drops of the second, stirring the while in order to effect complete admixture. It must be used immediately, as the pyrogallic acid, beginning to oxidise itself at the expense of the nitrate solution, soon becomes clouded and coloured, and a deposit of metallic silver takes place.

It is exactly at the moment when the reaction between these two substances begins that the attraction of the particles deposited by the first development upon those about to be precipitated is the most energetic; if, therefore, the pouring of the mixture on the plate be delayed until the solution becomes darkened, a part of its intensifying power will obviously be lost.

Many photographers throw the intensifying mixture on to the glass while the sulphate of iron is still on it; others drain off the principal part; while others, again, not only drain but wash with distilled water, so as to remove the iron more completely, and even wait until the washing water is thoroughly drained away. This is effected by standing the plate against the wall, preparing the mixture of pyrogallic acid and nitrate, and then pouring it on the glass for which it is prepared—of course on the sensitive film. This latter is the method which, from a theoretical point of view, seems to us to be the most rational.

After what has been said above, it is easy to understand the action of an intensifying mixture. The silver is precipitated where it has already been deposited. The action, instead of being energetic, takes place slowly, and an image of great vigour is produced from a very feeble one. The action can be arrested at any time by plunging the plate into water.

We have said that chemical analysis proves most satisfactorily that not a single atom of the iodide of silver has been removed or reduced. This is not the place to enlarge upon the theory of this mysterious action of light upon the iodide of silver: there is, however, one fact which we may not pass over in silence, by reason of its singularity.

If, instead of producing the image in the ordinary way, we dissolve in the collodion (necessarily free from iodides or bromides*) fifteen grains of nitrate of silver, pour this collodion on the plate, and immerse it in a bath of iodide of cadmium containing two per cent. of the iodide, a film of iodide of silver will be formed. But, strange to say, this iodide is non-impressible by light, even when the excess of iodide has been removed by repeated washing.

It is very different when, in the ordinary process, all the excess of nitrate of silver is removed by repeated washing of the film. If such a film be submitted to the light, and afterwards to a mixture of pyrogallic acid and nitrate of silver, an immediate image is formed.

It seems, then, that the iodide of silver tenaciously retains a portion of the nitrate of silver with which it has been formed; that it probably forms iodo-nitrate of silver, the existence of which we have demonstrated some years since, directing especial attention to its extreme sensibility to light.

This view of the case is supported by the fact that a plate prepared by immersion in an alkaline iodide bath, washed, plunged in the nitrate bath, and washed again, is sensible to light, although very much less so than in the presence of an excess of nitrate of silver; and, secondly, that a plate prepared in the ordinary way, washed on withdrawal from the nitrate bath, passed into a bath of iodide and washed again, is completely insensitive to light—that is to say, that the reducing mixture will not develop the least trace of an image.

There are some curious results from this fact. I would say, in fact, that if it be not desired to preserve a negative indefinitely, it is not necessary to remove the iodide of silver by hyposulphite of soda, cyanide of potassium, or any other fixing agent whatever. It results, in fact, from our recent experiments that if, at the conclusion of the development, the operator content himself by simply washing the film, as there will remain some traces of nitrate of silver, the light will render the unaltered iodide grey or slightly fogged. But if, on withdrawing from the washing bath, a diluted solution (containing one grain to a pint and a-half of water) of iodide of potassium be poured over the plate, the very slight excess

* Gun cotton 1 part, alcohol 50 parts, ether 50 parts, and nitrate of silver 1 part.

of nitrate of silver which the iodide of silver retains, and which was the cause of its rapid alteration, is removed, or rather converted into iodide of silver, and positives may be printed from it with impunity. The iodide becomes only slightly darkened, to such an extent as not to affect the image in the least—a fact which at first sight seems paradoxical.

Nevertheless we would direct attention to our expression, "if it be not desired to preserve a negative indefinitely." In those cases where it is desired to keep them we should certainly recommend the removal of the iodide by a fixing agent.

We have given, then, the theory of intensifying. It would have been easy for us to have cited other illustrative instances, which in the end would have come to the same thing. Such, for example, as the process in which after a first development the plate is carefully washed, immersed in the negative bath, and then diluted either with fresh sulphate of iron or pyrogallic or gallic acids. It is easy to see that these are fundamentally the same kind of facts—at least in a theoretical point of view, the only one with which we have to occupy ourselves in this place.

(To be continued.)

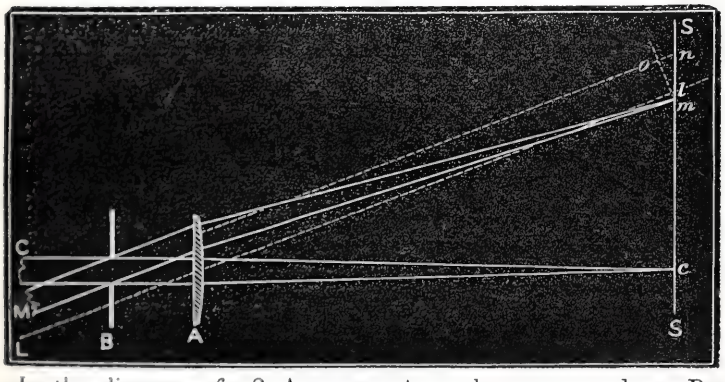
ON THE EQUIVALENT FOCUS OF PHOTOGRAPHIC LENSES, AND THE ANGLE OF SUBJECTS INCLUDED.* (DISPLACEMENT AND DISTORTION.)—Continued.

By Thomas Grubb, M.R.I.A.

In resuming the continuation of the subject I would first correct the error of a word in my last. For the word "*distortion*," at the end of the last paragraph but one, I must beg my readers to substitute "*displacement*," and to excuse my inadvertence should it have put them to any trouble to discern what was meant.

Having given in my last article the results of actual trials, showing what the displacement of a certain single combination is for fields of various angles and extending to 60°, I now proceed to show how the displacement of the image there shown to belong to a pencil subtending 20° to the axial (viz., 38 minutes of a degree, or rather less than one-sixth part of that asserted to be the case) is perfectly reconcilable with a *deflection of the said lateral pencil of 4° and upwards.*

FIG. 2.



In the diagram, *fig.* 2, A represents a plano-convex lens; B a diaphragm; C a central pencil of rays, which, passing through the lens, is brought to a focus at *c* on the surface represented in section by the line S S, placed vertically to the pencil C *c*.

Let the dotted line L *l* be the direction of a ray proceeding from a lateral object, and which, if the lens and stop were absent, would pass through the place of the optical centre of A and touch the surface S S at *l*, this point *l* is evidently the true point of representation—*free of displacement*—for the corresponding point in the object (viz., the point from which the ray L *l* had proceeded).

Next. Suppose the lens and stops *in situ*, the ray L can no longer proceed to *l*; but other rays proceeding from the same point, and all but parallel with L *l*, *will* pass through the stop B and the lens A. At the latter they will suffer both convergence and deflection, and finally be brought to a focus close to the surface S S at a point *m*, a little nearer the centre of the field than the point *l*. Now, *l* being the strictly correct point (or that of no displacement), it follows that the distance *l m* on the surface of representation is the true measure of the displacement produced by the lens for the ray L *l*, and so for all images subtending the same angle to the axis which that ray does.

The figure is constructed for an angle of 20° or half of a field of 40°, and the displacement is shown as accurately as the scale will permit, supposing the lens to be an "aplanatic." I apprehend that the simple inspection of the figure is adequate to show the perfect compatability of four degrees of deflection with thirty-eight minutes only of displacement. It may be not amiss to mention here that, should the lateral object be *very* near (*e.g.* in the case of copying), the ray L *l* and pencil M will not be *quite* parallel; but this will cause the displacement to be *still less* than for objects at mere ordinary distances.

I now come to show what would be the result if the "four degrees of deflection" were not present.

In that case the pencil M would suffer *convergence only*, and proceed in the direction of the point *n*. It would converge to a focus before reaching the surface S, by the quantity *o n*, and finally, on reaching that surface, form an indistinct image (or spot instead of point) displaced five times as much from the true point *l* as it would be had it suffered the four degrees of deflection.

The practical effect, therefore, of getting rid of deflection of the lateral pencils, if such were practicable, would be of a two-fold and very prejudicial nature. Instead of that near approach to perfect flatness of field which the lens really possesses, we should have a field of considerable curvature, and therefore not fitted to include a large angular field on a flat surface; and, secondly, there would be a displacement (by enlargement) in amount five times that of the present. The distance of the stop from the surface S, and not the focus of the lens, would govern the size of the image, and the displacement would reduce the intensity of the lateral pencil in a field of forty degrees to about two-thirds of what this is under existing circumstances. In short, the lens would be changed from very good to very bad, and we should have the "unbearable amount of displacement" spoken of in my last article.

My next I propose to devote to the subjects of *intensity* and *quickness*.

* Continued from page 225.

PHOTOGRAPHIC PRINTING ON ALBUMENISED PAPER.

By George Dawson, M.A.,

Lecturer on Photography at King's College, London.

In spite of the varied and precise information which has from time to time been communicated to the public by many of our ablest photographers on the printing and toning processes, much ignorance still seems to prevail in quarters where it ought not to be expected, and also (with more excuse) among our rising generation of young photographers. Indeed, if I may judge from the general tenor of the column headed "Answers to Correspondents" in The British Journal of Photography, and from the frequent communications I am expected to make in reply to inquiring notes, enclosing all sorts of hideously diseased prints under the sun, failures in this respect would seem to arise more from our correspondents' carelessness and culpable neglect in not perusing and taking advantage of the published experience of others than from the small amount of manipulatory skill required to ensure success. Printing, like all other photographic operations, requires a head to direct as well as hands to work. To the mere observer and quasi-photographer the manipulatory part seems the be-all, and end-all. They forget that success is mainly due to the head that knows the nature of, and can control, the many delicate chemical processes which are called into operation.

My object in this paper is not to enter fully into the minutest details of the printing process, but to point out as succinctly as I can most of the conditions of success which do not seem sufficiently attended to by those who are perpetually complaining of slaty, red, mealy, or feeble prints. The mere manipulation varies so with the kind of dishes, &c., employed, and is so easily acquired, that every one likes to carve out a method to suit his own convenience.

The first requisite is a good negative—that is to say, sharp and well-defined in all its parts. Viewed by transmitted light it should be opaque, or nearly so, in the highest lights, and gradually descending through all the gradations of half-tone to clear, transparent glass. From a negative possessing these characteristics we may obtain almost by any recognised method of printing and toning a vigorous if not a brilliant proof. But one of a feebler kind, or more translucent in the high lights—always provided there be good gradation of tone—may, by careful management, be made to yield beautiful prints of a softer character. These are eminently adapted for stereoscopic purposes, as they get rid of the snowy glare which often spoils the illusion of otherwise fine stereographs. All Wilson's negatives that I have seen are of this class, and every one must admire the charming brilliancy and softness of his pictures. Even negatives considerably fogged, or containing some deposit of silver on the deep shadows, need not be rejected; for it is quite possible from these, if they possess sufficient gradation, to

obtain very fair prints. They require different modes of treatment, which will be mentioned under the head "PRINTING." On the other hand, all negatives (except copies of prints and similar objects) which, by transmitted light, exhibit a sudden transition from opacity to transparency are of no value by any treatment.

Paper, Selection of.—A first-class paper is invaluable, and, unfortunately, not always to be obtained. One may readily detect by the eye inequalities of albumenising and like defects sufficient to condemn it; but the real printing properties of a paper can only be ascertained by actual trial. The best chance of securing the right quality is to pay the highest price at a first-class house which sells largely, and is therefore not likely to have an old stock on hand. Even then disappointment will sometimes follow, but not intentionally. Above all things the photographer should avoid buying job lots, which may have a fine appearance and appear to be cheap. They generally consist of odds and ends of different kinds of paper, requiring, as will be seen, different treatment, and will, in the end, be found too dear.

At the present time there are several varieties in the market which answer well for different classes of negatives. The highly albumenised thin Rive and Saxe papers are the best for stereoscopic and *carte* printing. The latter being the more sensitive of the two, may be used with great advantage for printing dense negatives and for ordinary work in dull weather. The former, possessing greater strength and thickness, will also suit well for larger prints, as it is not very liable to be torn or broken in the washing. As respects final tone and vigour, both kinds are very much alike; but they should never be printed together, nor toned in the same dish. The Saxe requires rather deeper printing, and often much less time in the toning bath, to acquire the same vigour and tone as the Rive. For large pictures the thicker qualities of Saxe, less highly albumenised, is now generally employed. It is very strong in texture, gives fine tones from warm sepia to black, and will bear almost violent handling and washing without sustaining injury.

The preparers of albumenised paper are generally blamed, often, I think, unjustly, when bad samples of paper happen to be sent out. They are responsible for all streaks and irregularities on the surface, and for the quality of the albumen. In this respect, if I may be allowed to speak only from experience, two of our principal makers, J. A. Spencer and J. Sanford (and probably others, if I knew them), display great care and skill. Seldom are we troubled with streaks, or our pictures jaundiced with stale albumen on a good paper which has passed through their hands. But we must bear in mind that without a good foundation or ground for the albumen all their care and skill is useless. Despite their vigilance in the selection of the paper, they are, to some extent, at the mercy of the foreign manufacturers and agents, who do not seem always to have considered it the wisest policy to supply the best article at the best price. There have, however, been great improvements lately in the uniformity of the samples which have come under my notice. Indeed I may say I have not met with one actually *bad*, out of the many tried. It is to be hoped, now the manufacture is better understood, that this improvement will be permanent.

Albumenised paper deteriorates, and some kinds more rapidly than others, by age. If kept in a dry place it may retain nearly all its original brightness for four or five months; but it is better, where practicable, to use it up sooner. The deterioration generally begins to manifest itself by minute red and white mealy spots on the surface, which may not be seen till the picture has passed through the toning bath, and in general diminished brightness of image.

PRACTICAL COURSE OF PHOTOGRAPHY.*

[Communicated to the Antwerp Scientific Association by M. C. OMMEGANCK, Director of the Association.]

Resumé of the Lessons on the Toning of Positive Prints on Paper. Critical Examination of the Various Formulæ.

A POSITIVE print on paper cannot be preserved in the condition in which it is taken from the negative: it very soon becomes uniformly black all over. It must therefore be submitted to an operation which, by removing the excess of silver salt, renders it insensitive to light. Up to this time only one salt has been found which efficiently accomplishes this object: it is the hyposulphite of soda, which has, however, the disadvantage of communicating to the print anything but an agreeable tone; and, in order to correct this defect and impart the tone generally observable in published pictures, the operation must needs be complicated by a second reaction known under the name of *toning*.

* From the *Bulletin Belge de Photographie.*

The great number of the formulæ is in itself an indication of their want of efficiency; but what more particularly perplexes beginners is the laconic character usually given to the descriptions of the manipulatory details.

Those who make their first experiments in photography often go from one formula to another, using a great deal of chloride of gold, nitrate of silver, and paper, and stop, sometimes, completely discouraged.

We have experienced so many difficulties in this way ourselves that the task of teaching others to avoid them becomes a very pleasant one. As there has not been a formula described which we have not minutely tried, a critical examination of the principles will not be without interest for those who, venturing into this labyrinth, desire to be led out of it.

Formula A.—When plain albumenised paper alone was used the proof was placed for an instant in chloride of gold, where it almost instantaneously became blue: it was then plunged into hyposulphite of soda. This method is not used now, the proofs yielded by it being of a mealy character.

Formula B.—About the same time chloride of gold was employed, added to a fixing bath of hyposulphite of soda, or in a separate and final bath. The brownish proof was immersed in the following bath until a violet tint was produced:—Fifteen grains chloride of gold dissolved in eighteen ounces of water, and poured into a solution of a quarter-of-an-ounce to three ounces hyposulphite of soda in eighteen ounces of water.

The greater number of proofs treated in this manner have faded, and especially those which were printed deepest, or toned in too old a bath. This toning was slow, costly, and uncertain.

The use of acetate of lead, of acids in the hyposulphite of soda bath, or of old hyposulphite baths charged with silver, will yield tints as black as charcoal, which please some persons, but which are, nevertheless, not very agreeable, and by no means permanent.

Formula C.—Toning by means of a solution of fifteen grains of chloride of gold in thirty-five ounces of water, used after the fixing by hyposulphite of soda, gives meagre tones, and proofs without vigour, especially on albumenised paper.

The substitution of perchloride of iron for chloride of gold in *formula B* is tempting on the score of economy. We cannot, however, recommend it; for a hyposulphite bath after one year's exposure to the air, had not lost all the salt of iron dissolved, and the proofs toned therewith always contain iron attached to the vegetable fibre of the paper, however prolonged the washings have been: besides the tone is generally flat and disagreeable.

All these processes are now completely abandoned: the toning is now actually carried on before the fixing by hyposulphite. The bath is neutral or slightly alkaline: the chloride of gold used is completely deprived of hydrochloric acid, and is also partially reduced to an inferior state of chlorisation. The liquid is sometimes colourless, sometimes slightly green.

The almost exclusive use of albumenised paper, and the difficulty of obtaining a suitable tone by any of the earlier methods, has given rise in these days to a host of formulæ.

Formula E.—A preparation which has been much in use, and which yields good results as to colour, is made as follows:—Dissolve fifteen grains chloride of gold in eighteen ounces of water, and pour this solution into eighteen ounces of water in which have been dissolved sixty grains hyposulphite of soda: when colourless add fifteen grains hydrochlorate of ammonia. If the chloride of ammonium be first added to the chloride of gold, as indicated by various writers, a feeble result only is obtained. This toning bath requires the proofs to be only lightly printed under the negative; moreover, it does not change the colour of the proofs in the hyposulphite. Notwithstanding the large quantity of sal-ammoniac, may not this bath be regarded as a sulphurating one even to the point of losing the prints? Do we not here bring a large quantity of silver salt in contact with a small quantity of hyposulphite? This salt of silver is a chloride, it is true, in the presence of an excess of soluble chloride (sal-ammoniac).

Experience has shown that this method of toning requires great precaution, and that serious doubts may be entertained as to the permanency of the proofs coloured by this method, especially in inexperienced hands.

Formula B.—The acetate of soda formula of the Abbé Laborde is much employed for albumenised paper, for which it is more suitable than other preparations which may be offered to the notice of photographers. It is the acetate of soda which here acts the part of a reducing agent on the chloride of gold. The following is the method by which we have advantageously prepared this bath:—Dissolve first one ounce of acetate of soda in three and a-half ounces

of water; add fifteen grains of chloride of gold, and watch carefully for the moment when the solution becomes colourless—a change which takes place very rapidly at this degree of concentration, and which may be even accelerated still further by means of a salt water bath, when the quantity is made up to thirty-five ounces by the addition of thirty-one and a-half ounces of water. If it be warmed too much the bath becomes green and entirely decomposed.

The proofs undergo a good washing as indicated in the preparation of the toning by hypochlorite of lime. (Formula H.)

Formula F.—The use of of phosphate of soda, introduced by Mr. Maxwell Lyte, has had, and still retains, justly merited favour. When properly prepared it gives good results. Phosphate of soda, as an alkaline salt, reduces the chloride of gold, and exerts a penetrating action on the coagulated albumen—an action which is greatly favoured by the solvent power of the phosphate over the albumen.

When prepared as described in the greater number of treatises proofs are obtained of a mealy character, and covered with red points.

In order to succeed, 200 grains of neutral phosphate of soda (2 Na O, Po_5. H O) (26 H O) should be ground in a porcelain mortar: this is the ordinary phosphate, which is slightly alkaline (restoring the blue colour of reddened litmus-paper). One grain chloride of gold, dissolved in one and a-half ounces of water, is then added; trituration is continued until the liquid becomes colourless (it will be found necessary to accelerate this reaction in winter by the application of heat); water is then added to make up the one and three-quarter pints, and, if necessary, the solution is filtered. The proofs are then submitted to washing as described in formula H.

Formula G.—A toning bath, applicable to albumenised paper or otherwise, and which works very rapidly, may be obtained by combining the formulæ of M. Laborde with that of M. Maxwell Lyte. The following is the method of manipulation:—First, dissolve in eighteen ounces of water 150 grains phosphate of soda and seventy-five grains acetate of soda; secondly, in eighteen ounces water dissolve fifteen grains dry chloride of gold. At the time of toning equal volumes of the two solutions are mixed in quantity to suit the requirements of the moment. One hour afterwards the bath is ready. It undergoes spontaneous decomposition, however, and will only serve for one operation. Carbonate and bicarbonate of soda are also employed for neutralising chloride of gold; but their use is attended with difficulty, and is not always successful.

Secret remedies are to be as much avoided by the operator in toning as in collodion. The substances already known give sufficiently good results without having recourse to the contents of flashily-labelled bottles, for which ten times their value is demanded.

We employ exclusively a bath analogous to that of M. Le Gray. We do not hesitate to say that the following quantities are altogether impracticable:—Three and a-half ounces of water, forty-five grains hypochlorite of lime, and fifteen grains chloride of gold. No proof can resist the decomposing action of this bath: it would be ruined in a short time.

The following is a complete description of the method of operating which we follow, which, above all, is the most economical, and which gives results leaving nothing to be desired:—

Formula H.—

Chloride of gold	15 grains.
Carbonate of lime	150 „
Chloride of lime	23 „
Water	7 pints.

Preparation:—Dissolve in *aqua regia* (nitric acid one part, hydrochloric acid two parts) metallic gold ninety grains; after solution add thirty grains of common salt to prevent decomposition during evaporation; evaporate by a gentle heat until the saline mass contains no more free water. It is not necessary to push the evaporation to complete dryness: a *trace* of acid does not much signify. Dissolve the salt of gold thus obtained in three and a-half ounces of water—distilled if possible; if not, rain water—and a solution will be obtained containing about forty-five grains to the ounce.

The advantage of this is, that it is no longer necessary to weigh every time small quantities of chloride of gold are required, nor is it necessary to preserve it from moisture. This salt of gold, generally called chloride, is a hydrochlorate of chloride of gold: thus—

Au =	1 equiv. gold weighing	196·70
Cl_3 }	4 equivs. chlorine weighing	142·00
Cl }	(1 equiv. chlorine weighs 35·50.)	
H	1 equiv. hydrogen weighing	1·00
	Total	339·70

—or, in round numbers, metallic gold 200, chlorine and hydrogen 140, making together 340; reducing we shall have $10 + 7 = 17$; multiplying by 6 we shall have, gold 60, chlorine and hydrogen 42, together 102: 90 grains of gold, then, will yield about 150 grains of the hydrochlorate in question. Two and a-half drachms of the solution are taken and triturated in a porcelain mortar with 150 grains of carbonate of lime. If it be intended to use the bath at once, these ingredients should be left in contact for one hour; if on the morrow, ten minutes will be found sufficient. By this treatment the chloride of gold abandons its acid and some of its chlorine. The whole of the operations should be conducted by the heat of a water bath in winter.

Carbonate of lime being nearly insoluble, a slight excess of it is not so important as an excess of carbonate of soda. This reaction being completed, 23 grains of chloride of lime are added: this latter salt should be specially prepared and preserved in closely-stoppered bottles, on account of its tendency to become moist and decompose in damp air. After that add 35 ounces of water, filter, and then add 5 pints more water, and preserve in stoppered bottles. When this bath loses its toning properties, either through age or exhaustion, it may be restored by the addition of about four drops to the pint of a ten per cent. solution of chloride of gold: when the bath has lost its smell, it may be restored by adding a little chloride of lime, previously diffused through water.

On a subsequent occasion we shall treat of the different papers, and of the proportions of nitrate of silver to be used for the preparation of positive papers. We would here remark that it is only by the use of fused nitrate that the middle tints, which make the charm of a good picture, can be preserved.

On being withdrawn from contact with the negative the proofs are soaked in the smallest possible quantity of water during ten minutes, then agitated for two or three seconds in a large quantity of water, and finally immersed in the gold bath, where they are kept in constant motion until they have acquired a decidedly blue tone. They are then plunged into a bath containing ten per cent. of hyposulphite of soda.

The tone of the proof changes at once to a violet-brown; but as soon as it is properly fixed it returns to a bluish-black. Finally, the prints are washed as before described. The hyposulphite bath will only serve for once.

The complete deprivation of free nitrate by washing, or treatment of the proofs with chloride of sodium or other analogous salt, does not make them tone any better.

EXPEDITIOUS METHOD OF PREPARING NITRATE OF SILVER FROM OLD BATHS.

The substance of the following paper is gathered from a very interesting article, by M. Mc-A. Gaudin, in a recent number of *La Lumiere*. The subject will be at once recognised as an important one to photographers, both professional and amateur; and on that account we have deemed it desirable to lay the matter before the readers of The British Journal of Photography.

It is only necessary to say, by way of introduction, that silver residues are divisible into two classes—one having served for sensitising collodion films and paper for printing, while the other is derived from waste in fixing and developing. The process under consideration refers only to the former.

Professional photographers have always on hand a large quantity of bath solution set aside for various reasons from time to time, and they are reminded by the writer of the somewhat complex treatment to which they must usually be submitted when it is desired to bring them again into the normal condition of crystallised nitrate of silver.

The method proposed by M. Mc-A. Gaudin is intended to obviate the necessity for such elaborate proceedings, and is based on the following chemical law:—If solutions of any two salts be mixed, a mutual interchange (usually called double decomposition) of acids and bases invariably takes place, *if*, by that mutual interchange, an insoluble salt is formed; and this law holds good for feebly soluble salts, even when they have not been dissolved separately and previously to admixture. It is, in fact, sufficient merely to digest the salts together with water, aided by ebullition, in order to ensure the reaction taking place.

Such is the principle involved. There are in addition one or two facts which should be taken in connexion therewith, to assist the reader in appreciating the ingenuity of the process.

Among metallic sulphates there are two which are remarkable for their insolubility, viz., the sulphates of lead and baryta: all other sulphates are more or less soluble. Sulphate of silver itself is *nearly* insoluble, but it dissolves sensibly in water aided by heat,

and, moreover, it cannot exist in the presence of a soluble salt either of lead or baryta. The reaction takes place but slowly on account of the insoluble sulphate which accumulates like a sheath round each particle and hinders the continued solvent action of the water. The mechanical agitation, however, produced by the bumping and bubbling action during ebullition, breaks up this outer coating and the action continues.

Supposing that it is desired to convert several pints of old bath into crystallised nitrate of silver, the writer recommends the addition thereto of a solution of sulphate of soda, by which means a precipitate of sulphate of silver is produced carrying with it the iodide previously held in solution. In order to save trouble in subsequent manipulation it is further recommended that the solution of sulphate of soda should be one of known strength, containing, in fact, ten per cent of sulphate: if the necessity for using *crystallised* sulphate in such a case be simply alluded to, the method of preparation will readily suggest itself to the reader.

The whole of the silver having thus been precipitated in the form of sulphate, collected on a filter and washed, it is ready for transformation into nitrate, which is accomplished by placing the thick pasty magma in a flask, and boiling it with a five per cent. solution of nitrate of baryta.

In reference to the proportions, it may be observed that the relative chemical equivalents of nitrate of baryta, sulphate of soda, and sulphate of silver, require that there should be added to the pasty mass of sulphate of silver two and a-half times as much of the five per cent. solution of nitrate of baryta as there was of the ten per cent. solution of sulphate of soda used in the production of the precipitate.

It will be obvious that when the reaction is complete an insoluble sulphate of baryta will be found in the flask, and a solution of nitrate of silver—this latter, however, very dilute, containing probably from three to six per cent.: by evaporation, however, the salt may be obtained in crystals.

The very diluted condition in which the solution of nitrate of silver is obtained by the foregoing method seeming to the author materially to reduce the advantages of the process, he was induced to try the nitrate of baryta in *crystals*. The same obstacle of course presented itself which was mentioned in the commencement of this paper, viz., the formation of an outer and protective coating of sulphate of baryta round each crystal; but the mechanical agitation produced by boiling eventually overcame this difficulty, and it was found that if to a mass of sulphate resulting from the use of one and three-quarter pints of the ten per cent solution of sulphate of soda two and a-half ounces crystallised nitrate of baryta be added, and enough water to make thirty-five ounces, when the reaction is completed a ten per cent. solution of nitrate of silver will be obtained.

It remains only to filter this solution, when it will be ready for use. The precipitated iodide having been re-dissolved during the reaction, the degree of acidity should of course be regulated; and this point being attended to, the bath solution thus obtained differs only from a freshly-prepared bath in containing a possible trace of nitrate of baryta—a salt which will exercise no appreciable influence on the result, any more than the nitrates of potassium, cadmium, or ammonium. J. MARTIN.

FUSED NITRATE OF SILVER.*

By Professor E. Emerson.

"Commercial crystallised nitrate of silver is frequently contaminated with traces of an impurity, which is probably produced by organic matters falling into the nitric acid employed in dissolving the silver. Repeated recrystallisation is required to remove this substance. If allowed to remain it injures the sensitiveness of the film to obscure radiations, makes the negative weak and metallic, reverses the action of the light, and produces either foggings or markings of various kinds, the result of irregular reduction of silver."—*Hardwich.*

I can furnish an illustration of the truth of the above passage by detailing the experience of a young friend of mine, who is deeply interested in amateur photography. His silver bath was carefully made with pure rain water and crystallised nitrate of silver, iodised in the usual manner, and was used at first at a temperature of 50° Fah. The collodion was a sample giving intense results in my own practice; but in my friend's hands the result, in every case, was very weak and metallic. The following changes were then made, in a course of careful experiments extending through three weeks:—

From *Humphrey's Journal.*

1. The acidity of the bath was varied.
2. The strength of the developing solution was modified.
3. The amount of acetic acid in the developer was varied.
4. The sample of sulphate of iron was changed.
5. Alcohol and ether were gradually added to the silver bath.
6. The bath was exposed to the sunlight for a day, after being made neutral.

The result of each of the foregoing cases was feeble negatives.

7. The temperature was now raised to 60° Fah.
8. The bath was boiled down, and carefully diluted again with pure pump water, and slightly acidified; but with no change for the better.
9. The developer was again varied in several ways. No improvement.
10. Care was now taken to see that the bath was fully iodised.
11. The temperature was raised to 70° Fah. for all the solutions.
12. The bath was again exposed to sunlight for a day; until, finally, every condition had been repeatedly changed, except that of nitrate of silver, and the uniform results were great slowness, and a weak and metallic image.
13. The nitrate of silver was now carefully fused, and the bath again made with pure pump water. The immediate and permanent results were rapidity and intensity with the same samples of collodion.

ON ALBUMEN.

By James Martin.

Quasi-Synonymes.—White of egg; proteine, sulphurised and phosphorised.

Composition (of pure albumen).—C_{400}, H_{620}, N_{100}, O_{120}, P, S_2.

Equivalent.—5412.

Preparation.—It is almost unnecessary to say that this substance does not admit of artificial preparation, being a natural product existing ready formed in the white of eggs, abounding also in the blood and chyle, and more or less in all the serous fluids of the animal body. It also exists in the sap of vegetables, and in their seeds and other edible parts. Notwithstanding this, however, there is a certain sense in which this natural product has to be prepared or modified to render it suitable for photographic purposes, and with the method adopted in doing this we may occupy a few lines, though the bulk of this "Note" will most appropriately be filled by a consideration of the *properties* of albumen.

Most of our readers will have observed that when the shell of an egg is broken, the white has a natural tendency to separate itself from the yolk, so that the exercise of a very small amount of dexterity on the part of the operator will enable him to collect the white of egg in one vessel and the yolks in another.

Albumen so obtained is generally too thick for photographic application, and requires copious dilution for most dry-plate processes; and, when not diluted so freely (as in the preparation of albumenised paper), requires not only the addition of some reagent, but also brisk mechanical agitation to impart the necessary degree of fluidity.

In the preparation of albumen for the Fothergill process, after having carefully separated the yolk and germ, it is usual to add to the whites of (say) half-a-dozen eggs, two ounces of water and forty drops of solution of ammonia. The whole is then briskly stirred with a glass rod for a few minutes and set aside for twelve hours, at the end of which time the thread-like portions will be found to have agglomerated into one mass at the top of the liquid, thus facilitating their complete separation. The fluid is finally made quite clear by straining through muslin, and afterwards stored in bottles for use. It will keep for many months in this condition so long as the presence of an excess of ammonia is maintained. It will be observed, on commencing the treatment with a glass rod mentioned above, that the albumen is somewhat thick and glutinous, and that it acquires the necessary fluidity much sooner than is usual when simply "beating up" eggs with a fork. This is attributable to the ammonia, which has the property in common with the fixed alkalies, potash and soda, of causing albumen to become thin.

More recent experiments have shown that this property is also possessed in a remarkable degree by glacial acetic acid, which effects the complete disruption of the cells containing the albumen, and it may therefore be employed with even greater advantage than the ammonia, as it is found that albumen prepared by treatment—*first* with acetic acid and afterwards rendered alkaline with ammonia—is much clearer, more limpid, and has better keeping qualities than that prepared by ammonia only.

In preparing iodised albumen for the collodio-albumen process a

somewhat different course is adopted. In addition to water, acetic acid, and the various iodising substances, the albumen is recommended to be whipped into a complete froth by means of a bundle of quills or a silver fork, and, the froth having been allowed to stand all night, the clear liquid which accumulates underneath is decanted into small bottles for use. Dr. Taupenôt, whose name this process sometimes bears, suggested a mixture of albumen and honey *fermented* in the original collodio-albumen process. The above method, however, as being more facile and ready, is now generally adopted. It requires the addition of a small piece of camphor to prevent spontaneous decomposition.

A very similar method is adopted *in the preparation of the albumen for albumenising paper*. The whites of any convenient number of eggs are mixed with an equal bulk of water (sometimes less, according to the requirements of the case), salted, and whipped into a complete froth by means of quills. Acetic acid is, we fear, almost invariably added previous to the "whipping up;" the propriety of doing so is, however, extremely questionable, as in certain conditions of the sensitising bath it gives rise to the formation of black spots.* Ammonia is also sometimes added to assist the desintegration of the small membranous cells in which the albumen is contained. The clear portion which subsides is decanted for use.

For the albumen process on glass a similar method of preparing the albumen is applicable, except that a very much smaller proportion of water is added (about one-eighth), and sometimes even none at all, and the ammonia is added much more sparingly—namely, one drop to five ounces.

Properties.—The ordinary properties of white of egg, which is, perhaps, the most convenient form in which to study albumen, are too well known to require description in this place. It will be the task of the writer, therefore, to refer as briefly as possible to the more recondite and peculiarly chemical characteristics of this interesting substance, striving in the description to answer the question—What is Albumen?

Albumen is described by Berzelius as a combination of *proteine* with sulphur and phosphorous and phosphate of lime. It is the most important part of, and is found dissolved in, the serum of blood. It forms two isomeric modifications, in one of which it is soluble in water, while in the other it is nearly insoluble in that liquid. In this latter condition it is called *coagulated albumen*, and in the former, to distinguish it from the first, *non-coagulated* or *soluble albumen*. The conditions of albumen yielded by a raw and a cooked egg will give the best idea of these two modifications of the same substance.

The more recent researches of chemists lead to the conclusion that *pure albumen* is a white insoluble substance, free from taste or smell, and that the condition in which animal albumen is generally met with in nature—*i.e.*, in white of egg and serum of blood—is attributable to the solvent action of a minute trace of alkali which is always present. The white flocculent precipitate which falls when serum of blood or white of egg (being exactly neutralised by acetic acid) is largely diluted with water, may be regarded as pure albumen.

A more accurate appreciation of the constitution of this substance will be arrived at by a consideration of the analyses of *proteine* obtained from different substances, and published by Mulder:—

	Vegetable Albumen.	Fibrine.	Animal Albumen.	Cheese.	Atomic Weight.	Calculation.
Carbon	54·99	55·44	55·30	55·159	40	55·29
Hydrogen...	6·87	6·95	6·94	7·176	62	7·00
Nitrogen ...	15·66	16·05	16·02	15·857	10	16·01
Oxygen.....	22·48	21·56	21·74	21·808	12	21·70

The last column of figures on the right hand gives the average constitution of proteine obtained from various sources, and the analysis of which has been conducted with great care; and, if to this be added 0·4 phosphorus and 1·6 sulphur, we shall have the per-centage composition of *pure albumen*.

The behaviour of *pure albumen* under the influence of heat and chemical reagents has not been minutely studied: the substance chosen for such investigation has generally been white of egg or serum of blood. The following observations, therefore, will be understood to apply to the first of these two natural products, which, speaking with chemical accuracy, is *not pure* albumen, as will be seen by what follows.

The most remarkable fact in connexion with the interesting substance now under consideration is its property of becoming solid, or *coagulating*, on the application of heat, or the addition of acids (especially strong mineral acids) and metallic salts—a property which renders it especially applicable in photography.

The temperature required to effect this change varies with the degree of dilution. If, as is the case with an egg, the albumen be very thick, a temperature of 145° is sufficient to make it assume the familiar opaque white appearance which is so well known: if, however, it be largely diluted with water, boiling becomes necessary, and the albumen separates during the operation in the form of a white flocculent precipitate.

Albumen enters into combination and forms for the most part insoluble compounds with the mineral acids and metallic salts. Among the latter its combination with nitrate of silver, known as albuminate of silver, is the most important to the photographer Questions have sometimes arisen as to whether this really is a definite chemical compound of albumen with nitrate of silver; and these questions have been regarded as answered by the fact that those organic matters which do not combine chemically with the silver have no influence on the colour of the compound produced by the action of light, whereas the result of the exposure to light of the combination of albumen with nitrate of silver is a redness in the tone of the reduced silver. The exact chemical constitution of the compound formed is, however, involved in doubt.

If white of egg be evaporated to dryness at a temperature never exceeding 125° Fahr., or, still better, in a vacuum over sulphuric acid, a hard, translucent, yellowish brittle mass is obtained, which contains besides albumen the other constituents of white of egg. If this be reduced to fine powder and treated with ether, traces of a fatty substance are separated. A subsequent addition of weak alcohol removes nearly all the other foreign substances. When thus obtained albumen forms, after drying, a white or perhaps feebly yellow-tinted powder, tasteless and inodorous, and destitute both of acid and alkaline reaction, if by means of diluted alcohol the slight trace of alkali which it contains has been successfully eliminated. In this condition, also, it does not coagulate even at the temperature of boiling water (212° Fahr.). Treated with water it softens, swells, and dissolves by degrees, and on the addition of more water forms a colourless, tasteless, mucilaginous liquid. Albumen thus dissolved in water is precipitated by alcohol. If the alcohol employed is not very strong or in large excess the precipitate will be again soluble in water: otherwise, however, the albumen will be coagulated. Ether also coagulates this substance, which is insoluble in oil of turpentine and in fixed oils. A portion of the sulphur which it contains exists in a very loose state of combination, as is shown by the readiness with which silver is blackened on contact therewith. It combines with acids and bases in the same way as proteine; but these combinations have not been minutely studied on account of the difficulties arising from the too great facility with which acids induce the coagulation of the albumen.

If our usual plan in treating of the various substances used in photography were adhered to in writing on albumen, the next division to be noticed would be its *Uses*. These, however, so far as photography is concerned, are sufficiently enlarged upon under the head *Preparation*, and with its domestic uses most of our readers are well acquainted. Pursuing the divisions previously adopted we come to the heading *Impurities*, under which little can be said, since it is doubtful if minute traces of alkali, phosphate of lime, and soluble chlorides can be strictly regarded as *impurities* in a natural production which necessarily cannot have been submitted to any commercial sophistication previous to its reaching the hands of the consumer, who himself removes it from its natural receptacle just at the time of using.

If the existence of impurities be not admitted, the next division, *Tests*, becomes of course inapplicable; though it might perhaps be observed under this head that, as the per-centage or relative proportion of *dried albumen* and *water* in *white of egg* varies with the time of year and the source of the eggs, good white of egg should yield on an average from ten to fifteen per cent. of dried albumen, which when treated with water will almost invariably give evidence of the presence of chloride on the addition of nitrate of silver.

The effect on the human body need not be enlarged on in this place, most readers being practically acquainted with the efficient manner in which it supplies the "waste of tissue."

In reference to the *Antidote*, it may almost be safely remarked that it is impossible to have too much of a good thing; and antidotes, therefore, would be unnecessary.

* See a paper by M. Davanne, *On the Inconvenience of the Acetates in the Preparation of Positive Papers*, at page 189.

Finally, it may not perhaps be inappropriate to direct attention to the necessity for accuracy in the use of the terms *white of egg*, *albumen*, *pure albumen*, *dried albumen*, *coagulated albumen*, and the like, as much misapprehension and loss of time may be saved thereby. The writer trusts that in what has preceded these remarks he has written what will enable the reader to realise the necessary distinctions.

CLEANING GLASS PLATES.*

By M. D. Van Monckhoven.

In photography glasses are employed with ground edges—that is to say, glasses which after having been cut with a diamond have afterwards been ground on their edges by means of a fine file aided by oil of turpentine. The object of this operation is to prevent the operator from cutting himself upon the sharp edges of the glass.

In place of crystal sheet, ordinary patent plate or even flatted crown glasses may be used, especially for the smaller-sized (under half-plate). Patent plate being more perfectly polished than flatted crown, is also more easily cleaned.

Whatever be the kind of glass employed the following is the method which should be followed in cleaning them, whether they have been used before or not:—

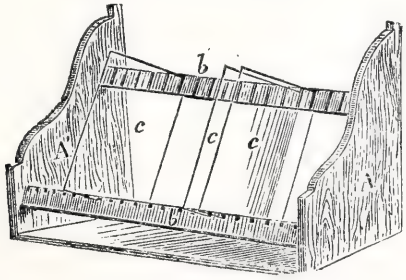
A mixture of equal volumes of nitric acid and water is made, and the glasses covered therewith on both sides by the aid of some cotton-wool fastened to the end of a stick; and as each plate is successively treated in this manner they are placed against the wall to drain.

Instead of nitric acid a solution of carbonate of potash of the strength of one pound to one pint and a-half of water may be advantageously used. The liquid acts energetically upon plates which have been previously used, and is free from the objection to which nitric acid is open, namely, that of staining the hands yellow.

It is always a good plan to clean a number of plates at the same time—as many as twenty for instance—because it is necessary to allow the alkaline or acid solution to act as long as an hour. The plates are then submitted to the action of a strong current of water, and rubbed at the same time on both sides with a sponge, in order to remove all impurities. It is almost unnecessary to add that they are finished by allowing the water to flow in all directions, copiously, on the inclined plate to carry off every trace of dust. They are then placed in a grooved frame, similar to *fig.* 25,

FIG. 25.

SUPPORT FOR CLEANED PLATES.



which precludes the necessity of description, where they are allowed to drain and dry. The photographer should furnish himself with several of these draining frames of different sizes, for they will be found very convenient.

The glass having been cleaned, is not yet sufficiently pure to receive the collodion: it is further necessary to resort to a more complete polishing.

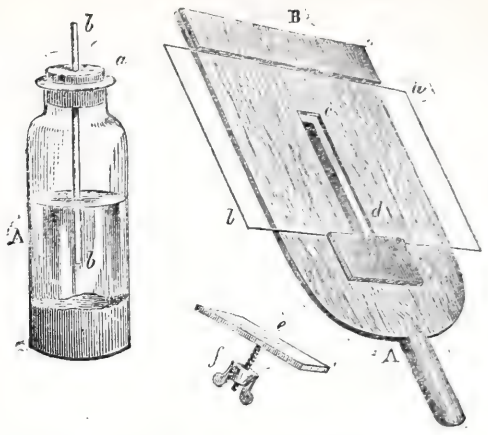
For this purpose an oak plate-holder, of the form A B, *fig.* 26, and of suitable size, should be used. At the end B is placed a piece of wood about the thickness of a crownpiece. A groove, *c d*, admits of a second piece, *e*, fixed underneath by a clamp-screw (*fig.* 27), to fix the plate *a b*, of any size within the dimensions of the plate-holder.

In addition to this, there should be near at hand a box containing *powdered tripoli*, which is found in commerce in a state of tolerable purity, and a bottle furnished with a tube of small bore (*fig.* 28), containing alcohol (1). The glass being fixed on the plate-holder (*fig.* 26), a few drops of alcohol are poured upon it, and then, by

* By special permission of the author we give a translation of some portions of Dr. Monckhoven's *Traité Populaire de Photographie*, the English copyright of which has been purchased by Messrs. Horne and Thornthwaite, London, who are about to publish an English edition.

FIG. 28. FIG. 27. FIG. 26.

TRIPOLI BOTTLE AND PLATE-HOLDER.



means of a little cotton-wool or unsized tissue-paper, also moistened with alcohol and dabbed in the tripoli powder, it is rubbed all over carefully, avoiding contact between the fingers and the glass. The rubbing is repeated, but without pressing too hard, until it has entirely evaporated and the plate is dry. The excess of adherent tripoli is removed by means of a dry linen cloth set apart for this especial purpose, and the final polish is given with an exceedingly dry buckskin or chamois leather, which should also be used exclusively for this operation.

The plate is then removed from the plate-holder, its edges and back wiped, and placed in a grooved plate-box. Care should be taken that that side of the glass which has been polished for the reception of the collodion film should in each case face the same way, in order to avoid errors in pouring on the collodion.

The plates should never be cleaned more than twelve hours before using, especially if the box in which they are contained is likely to be carried about, as in that case they would again become covered with minute particles of dust.

An Artist's Letters to a Young Photographer.

ON LANDSCAPE.

Light and Shade—Chiaroscuro—Breadth.

"To constitute *a picture*, there must be a fortunate combination or careful arrangement of lines and forms; and a favourable moment must be chosen for catching the light and shade most appropriate to the subject."—*G. Barnard.*

"The most learned arrangements of light and shade may astonish, but there is a charm in the *chiaroscuro* of nature which carries irresistible sway."—*Burnet.*

"I think I shall be perfectly well able to prove that 'mere natural light and shade' is the only fit and faithful attendant of the highest art: 'mere natural light and shade' is a very much finer thing than most artists can put together."—*Ruskin.*

"The highest finish is labour in vain, unless, at the same time, there be preserved a breadth of light and shadow."—*Sir J. Reynolds.*

"There is an evident tendency in nature towards one focus, or spot of bright light, and one portion of shadow, or concentrated dark; and, when in art these are in opposition, a greater and more brilliant effect is the result."*—*G. Barnard.*

"The pleasure arising from composition, as in a fine landskip, &c., is chiefly owing to the dispositions and assemblages of lights and shades."—*Hogarth.*

* Breadth is here described, and the one quotation therefore aptly gives point (photographically) to that immediately above it.

My dear Fellow-Student,

George Barnard, in his excellent work on *Landscape Painting*, says:—"As in art we make but a selection from nature according to the degree of taste and ability possessed by the artist, it is of the first importance that he should early attain the power of examining natural scenes, with the view of representing those lights and shades calculated to express the sentiment he wishes to convey; and, as in his previous attempts in the choice or arrangement of lines or forms, he has doubtless found the advantage of adopting some well-digested system of study, embracing the experience of ages, so, in the further prosecution of his labours, will he find that a like system tending to direct him in a judicious selection of the lights and shadows of nature, will greatly facilitate the acquisition of a just knowledge of pictorial effect." This will serve as an admirable introduction to the consideration of our present subject, viz., *Chiaroscuro.*

In connexion with kindred branches of study, we have already dwelt upon certain provinces of this quality of the picturesque, and it has also been touched on in portions of some very useful and practical papers read by a very active and praiseworthy member

of a very active and praiseworthy photographic society,* so that we have the less to consider now in my present epistle. In the first place, let us consider LIGHT AND SHADE.

In going to nature we should consider, first, the character and colour of the light, because these will inevitably influence the general effect of the *chiaroscuro*. As the light changes, if we watch attentively, we shall perceive variations in the aspects of different scenes which will perhaps astonish us by their great number and diversity: from these we must select that which is most consistent with our preconceived design. We shall see, as the light strengthens, that objects which, in a weaker light, were absorbed in the greater masses come out more distinctly, asserting their individuality, and exercising a very marked effect, for good or evil, on the composition and sentiment. Where, owing to the peculiar character of the scene, a strong light can exist without creating equally strong reflected lights—as in many close scenes is the case—a strong light is to be avoided; for the picture will otherwise want tone and harmony, and exhibit a patchy effect. I need not add that too weak a light has a tendency to generate a dull, heavy, monotonous effect, because, in common with the rest of us, such a discovery as this was doubtless one of your first lessons in landscape photography. The selection in reference to light and shade, &c., is to the photographer what design is to the draughtsman, and the first is so like the last, that the best of our critics are puzzled in examining the greatest works of art to tell where one ends and the other begins, and most writers on art use the terms as synonymous, as may be seen in many of the quotations I have introduced to you. In Lockhart's *Life of Sir Walter Scott*, you may remember he shows how the great novelist's artistically keen appreciation of the picturesque is mirrored in his faithful factotum and gamekeeper, Tom Purdie. Speaking to the factor's wife, Tom says—"When I first came here I was little better than a beast, and knew nae mair than a cow what was pretty and what was ugly. I was cuif enough to think that the bonniest thing in a country side was a corn-field enclosed in four stane dykes; but now I ken the difference. Look this way, Mrs. Laidlaw, and I'll show you what the gentlefolks like. See ye there, now, the sun glinting on Melrose Abbey! Its no aw bright, nor its no aw shadow neither; but just a bit screed o' light, and a bit claud o' dark yonder like—and that's what they ca' *picturesque;* and indeed it's unco bonny to look at!" Tom was right: the picturesque is largely due to effects of *chiaroscuro*. Nor, by-the-by, was he far out in his comparison of himself with the cow at one stage of his existence. This anecdote, moreover, illustrates how soon after it is once recognised the picturesque† makes itself appreciated.

We may here pause, perhaps, to define briefly a few of the terms used in reference to light and shadow. *High lights* are the more brilliant touches of light found on surfaces most prominently exposed to its influence: these blend with the *half lights* which are placed next to the *middle tints*, which glide into the *half darks* which join the *darks*, which are softened into the outlines, or are made delicate and transparent, despite their intensity, by the *reflected lights*. Then there are the *cast shadows*—or shadows cast by objects in direct light—which are of all shadows the most variable and the least manageable, although, at the same time, the most valuable; lengthening as the day shortens—altering as the sun moves—varying with the seasons—changing with the surfaces on which they are thrown, with the character of the light, and with the shapes of the objects casting them. Cast shadows are either a source of power and beauty in the composition or the contrary, according to the use your judgement and knowledge enables you to make of them. Some of the finest effects, in a pictorial sense, may be traced to these cast shadows, just as the ancient artist, Pansias, is said to have obtained a most wonderfully picturesque and expressive effect in painting a sacrifice by throwing the shade of the animal about to be slain upon the crowd below it.

To preserve the *truthfulness* of the light and shade we should remember, when intensifying our negatives, that, as all colour is more or less a privation of light, tone and harmony, as well as absolute truthfulness of effect, must require that no coloured object in the negative should have the same relative amount of intensity as white objects should possess. Truthfulness of light and shade is also truthfulness of form; every variation of shade, from the most delicate to the most powerful, merely representing a corresponding variation of surface—the two in fact being, in this respect, inseparable. Transparency in the shadows of your negative is a very important quality to the proper rendering of nature's light and shade. The more nearly the deepest shadows approach the condition of bare glass, the darker will be the more strong and vigorous shadows of the nearest objects, and, consequently, the more truthful will be your representation of depth, space, and relief. To lose these little vigorous touches of intensity is to lose at least three or four retiring planes in your middle distance. While intensifying we should also remember that to express truthfully retiring space, not only must the deepest blacks be found in your nearest objects, but also your purest whites—the atmosphere which tends to make one lighter also tending to make the other darker, until, in the remote distance, objects assume, more or less, the form of flat masses devoid of both lights and shades.

But all this bears reference purely to light and shade, and we must now consider that subject of which these merely form a part, viz., CHIAROSCURO.

Chiaroscuro means, strictly speaking, light and dark; because, although shadow may be described as the dark of a picture, the picture has other darks, such as results from dark—but perhaps well illuminated colours—which are not shades or shadows. Since every part of a picture works either for or against the whole, either strengthening its pictorial qualities or weakening them, we may be sure the *chiaroscuro* needs to be well managed, and that its importance cannot well be over-rated. One of the chief things to be sought in the composition of the light and dark is that quality the absence of which we have all heard so frequently denounced, and the presence of which is invariably lauded—the quality which makes its influence felt in the mind of every spectator, and with which we are all familiar under the title of BREADTH.

To avoid confusion in the parts, and secure simplicity and unity of effect, the lights and darks of the picture should be grouped into separate masses. By this we are not to understand merely the sweeping of all the lights into one corner, or of all the darks into another, but rather the melting of these two great pictorial divisions one into the other without any loss of the power and grandeur resulting from their separation into masses. To attain this lights should be associated with lights, and darks with darks, the more intermediate tints serving to blend these extremes into one harmonious whole, one principal light and dark being preserved, to which all others are to be subordinated. Still this unity should be so as to secure sufficient proximity of position or contrast between the focus of light and dark, which every good composition possesses, and the absence of which is apt to create insipidity and poorness of effect. We have already considered the power and importance of such contrasting points of light and dark in giving focus and space to the picture.

Certain modes of grouping the lights and shadows of a picture have been founded from time to time upon the most successful works of our great painters, but these and their modifications are so numerous that we need only bear in mind such as are most commonly and frequently adopted; for our practical experiments, blending with our knowledge of the principles to be embodied, will be sure to suggest many fresh adaptations or many minor alterations, more or less meritorious, but necessarily varied from the diversity of our subjects, and the required adherence of our art to "the whole truth, and nothing but the truth."

In some cases the lights or darks assume a wedge-like form—this species of composition may be found in many of Stanfield's pictures—in others they group to form a dome-like shape; in others, again, a point of light gradually emerging from a mass of half-tint and dark is seen, or a principal point of dark gradually absorbed into a mass of half-light tints. Sir Joshua Reynolds believed, as many now believe, that the only true principle is that of securing one chief light and two attendant lights: these to be well varied—so grouped as not to appear formal, and so associated with the surrounding tints as not to appear patchy. In many of Turner's pictures we see a great mass of light finding its focus of brilliancy in immediate contrast with some intensely dark object, which, echoed by small points of dark of subordinate intensity, stands boldly out as the most prominent object of the composition. Much clearness, brilliancy, and force is thus obtained. In other works by this master we find all this reversed, a brilliantly light object assuming the place of the dark. Claude's pictures exhibit effects similar to those of Turner. Sir Joshua Reynolds points out the masterly arrangement of *chiaroscuro* to be found in nearly all the pictures of the great Dutch masters, as many able critics have also done. Fuseli, speaking of Corregio's *chiaroscuro*, compares it to the "bland central light of a globe imperceptibly gliding through lucid demi-tints into rich reflected lights and shadows." This description is very suggestive. Titian

* Mr. W. H. Davies, of the Edinburgh Photographic Society.

† This term has been traced, like most art terms, to the Italian language, in which *pittoresco* signifies like a picture.

instanced a bunch of grapes as the finest example of breadth, from the perfection with which the two great masses of light and shade were grouped, while every individual grape possessed its own peculiar light, shade, and details. The presence and absence of breadth have also been compared—the former to a flock of sheep massed together, and so forming a prominent object in the landscape, and the latter to the same sheep scattered one here, one there, and so losing importance, if not altogether escaping notice. The importance of this subject is always recognised.

Some writers have endeavoured to establish certain rules fixing definitely the relative proportions of light and dark to be combined in a picture, generally allotting about one quarter to light, another to dark, and the remaining half to middle tint. This is folly, as such proportions must necessarily depend upon the subject selected and the sentiment or feeling you desire to convey. It is enough if we secure focus and breadth—two things which cannot well be separated—and make the proportions of light or dark such as will give power and force to the expression of sentiment. In *chiaroscuro* the motto should be, *masses, not spots*. I need not add, perhaps, that your masses must not be formal, or equal in quantity or position, or that their shapes should be pleasing, and not too strongly defined. Here, then, we leave our present subject. In my next we will review the ground we have occupied, consider the practical bearing of the whole, and then—adieu. A. H. WALL.

TESTIMONY IN FAVOUR OF THE TANNIN PROCESS.

We learn from the official organ of the French Photographic Society that M. Aimé Girard presented, at the April meeting of the Society, a copy of his translation into the French language of Major Russell's work on the *Tannin Process*, to which the following observations were appended:—

"Shortly after the introduction of the Taupenôt process, a new one was devised by Major Russell. Based upon ingenious reactions, taking advantage of the property possessed by tannin of coagulating gelatine, and acting as a preservative to the sensitive collodion film, this process appeared from the first to offer great promise of success.

"This prognostication has been realised from the earliest days of its appearance; and soon, received in England with a kind of enthusiasm, the tannin process is found in this country at least employed in photographic excursions almost to the exclusion of all other dry processes.

"However, the tannin process is still but comparatively little known in France; only some modest extracts of it having brought a knowledge of its principal points to the knowledge of photographers.

"In consideration, on the one hand, of this ignorance of a process which appears *a priori* very good, and, on the other, of the remarkable success which it has attained in England, it has appeared to me that it would be of some interest to place before the photographic world a literal and complete translation of the *brochure* that Major Russell has lately published in London."

Exhibition Gossip.

THE PORTRAITS—continued.

"No 'touched' pictures will be admitted." Resolutely and briefly thus said the Committee of Class XIV, Section 2, in their published "conditions," and, *therefore*, we must suppose photographic portraits elaborately worked up in monochrome stare out upon us at every turn we make in the British Photographic Department. Here they are in crowds. Some with all character and variety of texture sacrificed to a vulgar love of tea-boardy polish; others flattened out into the semblance of our so-called "profile accessories" by smooth, even washes of India ink and cut-out "French"* backgrounds; and others so be-scratched with a pin point brush that modelling, texture, drawing, relief, and every quality for which a good photograph is so singularly remarkable, is irretrievably ruined and destroyed. The best of these touched pictures are exhibited in the foreign courts; but *their* finest specimens (and some, as I have before said, are truly fine) do not equal a first-class untouched print by a good artist. Let us not encourage the painting of photographic lilies and the gilding of photographic gold, or offer a premium for bad photography by exhibiting it doctored and patched under the brush of some mechanical stippler in India ink in exhibitions to which it should be an honour to contribute, and to the exclusion of works more purely photographic.

* Why so called I know not.

I really believe if it were possible tomorrow to produce photographs representing the colours of nature as perfectly as we now represent her light and shade, some of these photographers would send them to the colourist to be painted over in oil or water colours, and others would admit them so coloured to their exhibitions—so blind is ignorance, so presumptuous is conceit! *

Mr. Mayall is very largely an exhibitor of "touched" photographs, and they are amongst the best; but place them beside this same gentleman's untouched portraits of the late Prince Consort and Lord Brougham, and how poor and inferior is the effect of the former! Amongst the worst *and most numerous* of these are, I consider, those exhibited by H. N. King. *Quo warranto.*

In the French department the portraits are very numerous. More uniformly good than the English, they are not yet up to the standard of our best portraitists. Indeed, in no one of the foreign collections will you find photographs equal to those of T. R. Williams. For the artistic qualites of pose, arrangement, &c., the French portraits are better than those exhibited in *any* of the various photographic departments; but they sometimes—often, perhaps—touch upon or fully enter into the affected and theatrical. The card-pictures here are, on the whole, superior to our own. The backgrounds are faintly defined and sketchy; the accessories are either real or look so. We see no staring "profile" furniture, no ridiculous "set pieces" branded by every genuine cast shadow and every touch of the sitter's hand or drapery as a palpable falsehood; while, as a rule, the French portraits are well rounded (or in other words, well lighted), well posed, and in good taste. The worst of the French coloured portraits, almost, are the unnatural, theatrical-looking masses of body-colour exhibited by Mayer and Pierson, the superiority of whose "touched" pictures I have already admitted, and the beauty of whose charming card-pictures I am equally ready to acknowledge. Some quietly-coloured and exquisitely natural-looking heads, by Numa Blanc, hanging near these, are amongst the best coloured pictures; but the display of coloured photography is smaller and very decidedly inferior, on the whole, to that of the English department. Some portraits, small and large, by A. Ken, are very fine. the tone of these pictures—a pearly neutral tint—will be sure to attract attention. The late Mr. Lacy informed me that he paid a tolerably large sum to M. Ken for the secret toning process by which this tone was produced; but I have since been informed, by a personal acquaintance of the French artist, that the formula may be obtained of the latter for a sum comparatively trivial. If so it is well worth purchasing. E. Delessert exhibits some very excellent photographs, and so does Carjat. The French *carte de visite* portraits read many lessons to us, which I hope we shall duly receive and be the better for; and, by way of return, let our French brethren learn from us many valuable lessons in the art of taking landscapes and making genuine pictures of purely natural scenery. Among the portraits here are some peculiarly interesting, in the shape of a collection on china, glass, enamel, and "all kinds of ceramic substance," by the well-known French experimentalist Lafon de Camarsac, whose first process for the production of such works was published in 1855. These are strikingly excellent, and for insertion in lockets, brooches, or bracelets, are very effective and pleasing. I cannot say as much for some portraits in carbon by the same, although these also are among the best I have seen. Some very good portraits taken by the electric light are exhibited by Nadar.

We have some good portraits in the Russian class 14: those "photographed on canvas," and painted by G. Rumine (a resident in England), are particularly fine. John Mieczkowski (how on earth is it pronounced in English?) has sent us some very good photographs which, as he informs us, were "made in the month of December, 1861, in very short and cloudy days," and are "unretouched." Some very good card-pictures are exhibited by Una and Hoffert.

Rome has produced some excellent portraits—vignetted card-pictures—of the kind just now so popular in Paris, and likely, of course, to be no less popular in London (as significant signs already intimate to the professional photographer). Portugal also exhibits some very good portraiture. The pleasant little island of Jersey has its photography represented in a very prominent position by the portraits of H. Mullins, which are very good, although we think sundry and various spots might as well have been touched out before the specimens were exhibited. We should prefer less prominence in the objects of his backgrounds, and also a little more

* Is not our contributor "saddling the wrong horse?" The public demand coloured photographic portraits, professional portraitists meet that demand to earn their bread, not to teach art.—Ed.

variety of tone in the *chiaroscuro* of some (I am now speaking of this gentleman's *cartes de visite)*. Mr. Mullins's backgrounds, however, are generally used with some appreciation of their suitability, which is something to say now-a-days. Greece has sent us some dingy sulphur-toned portraits, by F. Margaritus, which hardly support our conventional ideas of "Grecian beauty." These are marked for sale: they are not likely to be "joys for *ever*" to their purchasers, even if in the estimation of such they *may* be "things of beauty."

There are some singularly fine portraits in the gallery of the Indian department, possessing many of the best characteristics peculiar to pictures by T. R. Williams, and very interesting as illustrative of physiognomy and costume—things which are seldom done justice to in bad photographs, as these will go far to show when contrasted with others in the same department. These fine productions fill two small screens, one on either side of the gallery. Some portraits quite as interesting in certain respects, although far from equalling them as photographs, will be found in the South Australian division, exhibited by the General Committee. The faces here are far more comic than repulsive. Others to which a similar description will apply may be found from New South Wales, from Queensland (hideous specimens of humanity), from Natal (specimens by Dr. Mann to show the eccentric variety of natural head-dresses adopted by the Kafirs), and from many other foreign lands.

We find in our rambles about the huge building no end of dingy yellow portraits. Brazil contributes to the number a collection of *cartes de visite* and other portraits on paper and glass. New Zealand has a goodly show of them, amongst which are two large frames containing portraits of all the gentlemen forming the "Houses of Representatives," grouped into the shape of two large spades, or hearts, or something between the two. These are by Crombie, who also favours us with a woodcut of a one-storey wooden house with a shop below it, and "Crombie's Royal Photographic Gallery" in large letters along its front. British Columbia supplies its quota to these dingy or fading memories of far-away faces, taken on leather, cloth, glass, and paper.

Time warns me to conclude our present gossip, and I must defer noticing some few remaining collections of portraiture belonging to other departments until our next. Before closing this article, however, I may as well add that there are those who could tell to whom the medals are to be awarded, although I suppose the names of the fortunate exhibitors will not be known until the 11th of July, when, at a state ceremony—which, by-the-bye, is to be made another source of increase to the Exhibition Fund—and at one o'clock in the day, and in the Exhibition building, or in the Horticultural Garden, his Royal Highness the Duke of Cambridge will duly award the honours of this great and peaceful fight to its well-deserving victors. There is something in connexion with this event to the full as wonderful as other great events of the year. The exhibitors may absolutely have tickets to see their works on this one occasion—*gratis!* A. H. W.

Reproductions.—Messrs. Cundall, Downes, and Co. are about to publish, for Mr. S. Solomon, a series of photographs after drawings of Jewish ceremonials. The artist has, with remarkable ability and good judgement, given himself to the representation of incidents in the history of his people, and with such success that his works are looked for with interest. The series in question will comprise—1. The Presentation of the Child for Circumcision on the Eighth Day. 2. The Marriage: this is performed under a canopy, which represents the canopy of Heaven. 3. The Week of Mourning: the nearest relatives of the deceased remain in the house for seven days after the death. 4. Carrying the Scrolls of the Law in the Synagogue. 5. The Eve of the Sabbath,—the mistress of the house lighting the Sabbath lamp, while the children are singing the psalms for the reception of the Sabbath. 6. The Eve of the Passover: the head of the family repeating a history of the feast, while the table is spread with various symbols. 7. The Fast for the Destruction of Jerusalem: the Synagogue is divested of all ornament; the Rabbi, sitting on the steps of the Ark, chants the Lamentations of Jeremiah; the building lighted only with small tapers, one held by each of the congregation. 8. The Day of Atonement: the chief minister with the scarf or talith drawn over his head, and the congregation kneeling. 9. The Feast of Tabernacles: it is the custom to build a small wooden room in the open air, which the people decorate with evergreens, and sit in for seven days. 10. The Feast of the Dedication of the Temple: the minister represented lighting the lamps; the choristers chanting.—*Athenæum.*

WHERE TO GO WITH THE CAMERA.*

By Our Own Pioneer.

ROUND ABOUT THE CORNISH COAST.

If the artist should determine on rendering his collection of Cornish coast views complete up to Moorwinstow—the most northern part of the county—he can, after taking Canworthy Bridge, and some excellent "bits" round and about Warbstow, proceed on to Jacobstow, keeping Mary Week Tower, a point of sight for many miles round, in view all the way. At the fork of three roads will be found one of the best specimens of the bold and massive guide-posts so peculiar to this county, and so well adapted for the stereoscope.

On turning the road, to the left, the tower of Jacobstow Church comes in view, rising, in fine proportions, from a dark screen of foliage—the rectory gate and overhanging clump of noble elms coming in on the right, and the blacksmith's shop, dwarf wall, and malting-house making up a good foreground. Several views may be taken in this little wooded hollow, the church forming the principal object in each. Passing a lane by the foot-bridge, and ascending the newly-made road, on stopping at the last gate, by the old ruined cottage, and looking back, a most extensive scene presents itself, stretching from Launceston on the right to St. Gennis on the left. A further walk of about a mile past the road to New Mill, across a road stream, with a good cottage subject in a gully, surrounded with wood, the last turn on the crest of the hill brings in full view the tower of Mary Week. Passing some bars, or wooden gate, and over a couple of fields, you come up to the church itself, with one of the best-built decorated towers in the county: it is well placed for taking, and from many situations will give telling and effective pictures.

The only place in the village of any interest is the remains of the old religious house, founded as a "lodging for masters" by Dame Thomasine Bonaventure, originally a poor girl of the place, employed to tend sheep on Mary Week Down. Her comeliness attracted the attention of a London merchant, who made her his wife. At his death she again married, and again became a widow; when, for the third time, she married, and became the wife of Sir John Percival, Lord Mayor of London, whom she outlived, and retired to her native village of Mary Week, and passed the remainder of her days in acts of goodness and mercy—clothing the poor and releasing prisoners. Her will, bearing date 1512, is still extant, and the well-known shield of the City of London carved over the doorway of the religious sanctuary or "lodging for masters" alluded to.

Mary Week Down, with Whitstone Church in the hollow beneath, will make a very effective subject. On a clear day the panoramic effects around this district are truly magnificent. From the north-east corner of Mary Week Churchyard a most extensive view may be obtained, taking in Bude with its white silvery rows of cottages—the immense headland of Henna Cliff on the north, Stow Point in the extreme distance, Marham-church village and Marham Church itself coming in as good central objects. Retracing the road, seaward, Poundstock, and the rocky beach below the Church Town, will give one or more good pictures; then to Widmouth, a broad expanse of sand, immense bluffs right and left, a good foreshore, with detached rock about the centre, and often good groups of men, horses, and waggons carting away sand. About a mile from this, on the Bude road, is the village of Marham church, a very picturesque spot. From this to Bude itself is one uninterrupted series of interesting subjects, either by the road or canal banks. Much that is good for pictures is bad for health, consequently many of the old-fashioned, low, quaint-looking cottages and farm-houses that artists and painters so much covet, are being pulled down, and something very *healthy*, but very *ugly*, erected in their place.

Bude—with its sands and sea, castle and canal, breakwater and rocks—offers most temptingly to photographer and artist. A resident professional photographer, who has a convenient glass-house and produces some good pictures, will be found civil and obliging to any artist or amateur who may give him a call. The subjects round and about are so numerous and apparent that I can only say look and choose.

A point much in favour of Bude is its quietness. The ships that get in are few, and generally lying in positions on the sand or canal most favourable for photographing. Better and more certain pictures can be obtained here than in larger crowded ports. There all is bustle and confusion, and just as you imagine a good quiet point has been seized, two or three intruders approach to see what is doing, and you find your chance of a picture gone. At Thorne's establishment a car, drawn by a mule, can be hired, and the operator and requisites for the wet process conveyed to any point he may desire. Pictures of waves dashing over the breakwater, waves breaking across the sands, boulders, and many others of interest, may be secured instantly.

Half-an-hour's walk across the fields or through the village of Poughill leads to Stratton—a place of considerable note from the contests that took place between the Royalists and Parliamentarians. There are plenty of inns to put up at—from the "Tree," by Mrs. Ash, to the "Ring of Bells;" or good anchorage and stowage may be had on board the "Ship." For so small a place, the number of public-houses is large: perhaps the proximity of the salt water makes the inhabitants thirsty. A general view of the

* Continued from page 234.

town from the hill below the Union, the church tower standing well out from among the various buildings, with high banks thickly wooded, broken ground right and left, will give a capital picture, every part so situated as to be capable of being brought out in fine relief. Another good one can be obtained from Stamford Hill, the spot where the great engagement of 1643—between the Cornish Royalists, headed by Sir Beville Granville, and the Cromwell party, headed by the Earl of Stamford—took place. The spot may easily be recognised, as it is close to the road; a tablet erected against the mound records the circumstance. From this situation a fine panoramic expanse lies open to view. Marham Church, with the high ground about the "incline," to the left; Flexbury and Poughill, with its church and tower, to the right; Bude Castle-house and the line of white cottages ending with the "Falcon," make a middle distance, backed by the grassy downs and slopes; while bearing away to the extreme right, are Bude Haven, Sir Thomas Acland's cottages, the breakwater, high and deeply indented cliffs with look-out tower on top, a sloop or two anchored in the channel or high and dry on the sands, with an immense expanse of bluff and headland receding away in the extreme distance, the great North Atlantic Ocean closing all in, with a sunset, in particular, of unsurpassed magnificence.

The tower of Stratton Church, from the front of the "Ring of Bells" and from the Launcels Road, taking in some good cottages and trees right and left, is worth securing. The inside of the church will also photograph well, having the favourite points, plenty of room, and plenty of light. A fine monument can be included of a knight in armour, Sir Ralph de Blanchminster.

About a mile on the Kilkhampton road is a most picturesque old mill, the approach to it being down a very steep road. The old stone bridge overhung with ash and wild briar—the rough run of water, with the mill just seen between the trees—is an excellent specimen of quiet effect. Equally good would be a near view of the mill. Before leaving Stratton a visit might be made to Launcels, and pictures taken of the church from the lych gate, with the fine overhanging trees, and the interior with the carved speccot pew.

On the road to the "Red Post" is a turning that leads to the "incline"—an immense mass of engineering ingenuity used for raising up the boats and barges from the Bude canal to the higher one that passes on to Holsworthy, Tamerton, and other places in Devon. The immense pieces of massive machinery, in chains, pulleys, ropes, and blocks, stand out in well-defined clearness. It is a first-rate subject, and if you take into consideration the expanse of landscape, distance, rock, and sea that could be included in connexion with it, a scene equally good and extensive it would be difficult to find elsewhere. The boats as they come up the incline and slide into the upper canal—with the men guiding and uncoupling the same—is an interesting scene; though these boatmen have not the brigandish cut of the Birmingham canal men, as they lean, pipe in mouth, on the wooden companions of Crawley and Co.'s flying fleet.

An inn—the "Red Post"—close to this will be found clean and comfortable; and a short journey past the blacksmith's shop at Launcel's Cross, through Grimscott, will bring the tourist to Kilkhampton, some four or five miles north-east of Stratton. The church, the scene of *Hervey's Meditations*, has been lately restored by Lord John Thynne, the rector's father, and numerous noble descendants of the Grenville family have contributed a splendid series of "*in memoriam*" stained windows. The old carved pulpit is a fine specimen of handicraft, while the arches of the three aisles are supported by pillars of slight and elegant proportions. There is a noble tower and west doorway; but the great point of attraction is the south entrance, with the Anglo-Norman semicircular arch with its bold, zig-zag moulding. I much question if a successful photograph could be taken of it, on account of the arch being in a porch. I have known such subjects, on trial, to be found impracticable. The village views, with old houses and tower, are good.

The distance to Stibb, Sandymouth Cliff, and other parts of this interesting coast is but trifling—some two miles or so; while in the deep hollow of the valley is a little sheltered spot, called Combe, close to the sea, and from its peculiar situation well arranged for photographing. It is worth a visit, and is only a short distance from the remains of the once magnificent abode of the Grenvilles, called Stow. About three miles further north is Moorwinstow Church, and Moorwinstow Church Town—the most northern point in Cornwall, about ninety miles from the Land's End. In this parish is the source of the Tamar, which, after pursuing a southerly direction for nearly forty miles, falls into Lynher Creek, and forms the great harbour of Hamoaze at Plymouth. The Lynher, Looe, Fowey, and Fal, with the Alan River and Dosmery Pool, would offer to photographers a mine of artistic wealth. The situation of the church at Moorwinstow is peculiarly romantic—close to the cliffs, with cottage and old lych-gate at the entrance. The east end, including the great point and bluff, and the west, taking in the Elizabethan vicarage, are good and effective subjects; so also is the broad down, with the irregular group of cottages in the corner. At this time of the year the play of the sunlight and shadow on the ocean views and wild cliffs of the Cornish coast are broad and varied, while the same applied to its moorland and river scenes constitute the very poetry of landscape, and may be met with in endless variety from here to the Land's End, and from the Land's End to the Rame Head. From this Exeter can be reached by the North Devon Railway, or a coach may be taken from Bude to the Copplestone Station.

Notes of the Month.

THE full tide of one of the most brilliant London seasons ever known—a season presenting a series of unparalleled attractions—leaves but little time to photographers for the addition of any new facts to the store of photographic knowledge. They are, as a rule, too strenuously engaged in the *practice* of their art to allow of time for theorising.

It is said that never before have so many eminent men in every department of science and art been gathered together under one roof as at some of the *conversaziones* held during the past month.

We have much pleasure in announcing the safe return of Mr. Francis Bedford from the East. The whole party have returned in perfect health, with the exception of General Bruce, who has suffered severely from fever contracted during the heavy rains to which they were exposed at Lebanon. So rapid was their transit from place to place, that the extent of ground traversed in the time they have been absent would seem incredible, did we not take into account the facilities afforded to royalty, and the means set at the command of an individual of such exalted rank as the future sovereign of the British Empire.

Mr. Bedford had much to contend with in all the difficulties incidental to Eastern travel. Heat, dust, rain, agitation, and exposure to a blazing sun on the backs of mules and constant travelling, are not particularly conducive to a perfect balance of such sensitive agents as photographic chemicals, and made it no small matter to keep them under perfect control and prevent them from breaking out into open insurrection. The total number of plates secured is upwards of one hundred and ninety; but the number which will be published is one hundred and seventy, the remainder being of too private a nature for general publication. The series includes some of the loveliest, most picturesque, and desolate scenes of nature, and the ruined remains of some of the most ancient, interesting, and grandest works of man—Cairo, the Nile, the Jordan, the Dead Sea, and the Lake of Genneserat, the district of Lebanon and the Mount of Olives, Damascus, Joppa, Nazareth, Jerusalem, the Plains of Mamre, Athens, Constantinople, and Malta. One of the public west-end galleries will be engaged for the display of the whole series as a separate exhibition, which will be opened during the present month. Thus the public will not have to wait for the far-off Winter Exhibition; and it is also a matter for congratulation that there will be at least one good display of English photography during this all-important season, in a position where it is likely to be seen. These views are announced for publication by Messrs. Day and Son.

One of the most extraordinary collections of art-treasures ever yet gathered together is that now displayed at the South Kensington Museum. It was a happy thought, and deserves all praise. The thoughtful observer can now, fresh from the study of modern art at the International Exhibition, step across the way and study the art of the past.

The Builder pays a just tribute to photography for its splendid reproductions, exhibited in the Roman Court of the Great Exhibition, of some of the grandest works in ceiling painting that art has ever produced. The photographs are said to reveal to students much of the art and mystery of Raphael's rapid and masterly manipulation that they could form no conception of while the works were at so great a distance from the eye. We more particularly allude to those of the Farnese Palace.

Signor Beato's photographs, taken during the Chinese war and the Indian mutiny, are now on view at Mr. Hering's, in Regent Street, London. The collection not only gives views of all the more interesting and best known spots connected with the mutiny and the war, some of which are panoramic, but also depicts the terrible sight of a battle field as it remained after victory and defeat; showing the dead strewn thickly about the field they fought to gain, their sun-dried corses and bleached bones showing horribly distinct, and all the varied circumstances of their retributive slaughter.

In the South-east Transept of the Exhibition Building is a model of a house with an apparatus (purporting to be designed for photographers) for conveying persons from the ground floor to the roof. The platform upon which people are to take their place (after paying their money), and the means used, are very similar to those employed in the ascent and descent of the shaft of a coal mine. In these "sensation" days—when people like things so highly seasoned—the days of Magenta dye, and colours beyond anything in the chromatic scale—the idea may be worth adopting; we commend it to the London Stereoscopic Company or some other of the large portrait establishments.

S. T.

Scraps and Fragments.

TAX UPON PHOTOGRAPHY.—It is rumoured that the French Government have it in contemplation to levy a tax upon photography—every print to bear a tax of five, ten, or fifteen centimes, according to its size.

THE EXCAVATIONS AT ROME.—We hear that the photographers are already busy on the Palatine Mount, depicting these disinterred temples and relics of ancient art. The discoveries are said to be very remarkable for their beauty, and of great historical value.

PHOTOGRAPHIC SOCIETY CLUB.—The members will dine together at "The Star and Garter," Richmond, on Friday next, 4th inst.—the President, the Right Hon. Sir Frederick Pollock, will take the chair at six o'clock precisely. Upon this occasion, photographers who desire to join the party, are invited to communicate with the Honorary Secretary, Dr. Diamond, Twickenham House, Twickenham, who will make arrangements accordingly.

THE COPYRIGHT (WORKS OF ART) BILL.—The following have been named of the Select Committee to which this Bill has been referred:—The Lord Chancellor, Earl Granville, Duke of Argyll, Marquis of Westminster; Earls St. Germans, Derby, Stanhope, Carnarvon, Grey, Somers, Ellenborough, Ellesmere; Viscounts Sydney, Hardinge, Stratford de Redcliffe; Lords Overstone, Cranworth, Wensleydale, Chelmsford, Taunton, and Wodehouse. The Lord Chancellor has been appointed Chairman of the Committee.

NOVEL IDEA.—In Messrs. Dickenson's Exhibition, in Bond Street, some very large photographs, seemingly coloured on ivory, attracted our attention. Ivories of this size being very expensive, and very difficult to treat photographically, we proceeded to examine them, when we found that the head and face only were on ivory, the figure and background being on the usual plain salted paper. It appears the heads are printed on a piece of ivory cut to the requisite size and shape, and this is then very carefully inserted into the mounted paper photograph.

TWO WAYS OF PUTTING IT.—The following appeared lately in the *Daily Telegraph* when alluding to the Philosophical Instrument Department of the International Exhibition:—

"First among exhibitors in this scientific department we are inclined to place Mr. Ross, if only because he, with perhaps the single addition of Mr. Dallmeyer, can challenge comparison with the great Voigtländer himself for photographic and other lenses."

How differently these matters appear to different observers. We should rather have written—"The only one amongst the foreign exhibitors of photographic lenses whose productions can challenge comparison with those of Ross and Dallmeyer is M. Voigtländer."

SALE OF PHOTOGRAPHS AT THE INTERNATIONAL EXHIBITION.—*The Standard* says:—

"Yesterday also we were enabled to inspect a number of stereographs and *cartes de visite* just issued by the London Stereoscopic Company. It is pleasant, as showing a love for art and a desire to possess mementoes of the Exhibition, to be able to state that all their works, and especially the slides, are going off very fast. Among those just issued we notice particularly a stereograph of Gibson's *Venus*, for which there is a perfect rush; a slide of Minton's majolica fountain, another of the south-eastern picture gallery, one of the entrance to the staircase in the western dome, one of Thomas's *Lady Godiva*, and one of the nave from the western dome. The *cartes* include the statues in the Italian Court, the dais as it was, the orchestra as it was, the Prince of Prussia and suite on the dais, the machinery annexe, and the foreign half of the nave. The portraits of the Prince and his suite, as well as that of Sir C. W. Dilke, are really excellent, although so small."

A HINT WORTH KNOWING.—A correspondent says:—"Visiting the studio of your contributor, Mr. A. H. Wall, at 35, Westbourne Grove, when the gloom of evening had sent home that gentleman's operator, and closed his business for the day, as I thought, a lady, desperately anxious to secure a portrait of a son leaving England on the following morning, made her fluttering appearance, breathless with haste. Of course, I expected her immediate dismissal. Not at all. Mr. Wall merely apologised for leaving me, and soon exhibited as good a negative of the outward-bound juvenile as he could have produced at an earlier hour of the day. Expressing surprise, I was at once informed that this was done by simply dipping the plate, after its removal from the silver bath, into another bath containing the usual pyrogallic developing solution, by which the sensitiveness of the plate was singularly increased, and the density of the image so great as to render after-intensifying almost unnecessary. Mr. W. said he frequently got good pictures of very young children by this plan when he must have failed by the adoption of any providing a less sensitive medium. When the picture so taken comes from the camera it is of course partially visible."—["Facts are stubborn things;" but so, also, are editors, especially when they have experimented in a certain direction and have arrived at conclusions opposed to those of their correspondents. We have no doubt of Mr. Wall's skill either as an artist or an operator, but we dissent altogether from the conclusion that a plate treated as described above gains in sensitiveness. We have tried many careful experiments with a view to solving the problem assumed to have been proved in the affirmative—a scientific friend making parallel experiments at the same period, notes being compared subsequently—and the results arrived at by both of us tallied remarkably. We both found that sensitiveness was neither increased nor impaired; nevertheless our friend frequently pursued the practice afterwards, as sometimes it effected a convenient saving of time subsequent to exposure.—ED.]

PHOTOGRAPHY AND COMMERCE.—The influence photography has exercised vastly increasing the demand for so many articles of commerce has been more than once hinted at in this and various contemporary journals. It has been computed that not less than the enormous quantity of *twenty tons* of nitrate of silver is consumed annually by photographers. In the button manufactories of Prussia the trade has recently received a fresh and most important impetus by the introduction of micro-photographic studs, buttons, &c. The number of these novel productions produced daily for home consumption and exportation is said to be something startling. Not long since, for instance, studs and buttons containing portraits of Garibaldi were sold by the hundred thousand at a time. The large demand for photographic book-marks continues, although when we know that the rate of remuneration for providing and inserting these photographs does not average more than a penny each, the wonder is how that demand is supplied. The immense sale of *cartes de visite* and stereographs, as articles of commerce, is well known. Again: it seems likely that owing to the great demand for albumenised paper, and the increased purity of the albumen used by most of the best manufacturers, photography is likely to exercise a very serious influence upon the egg market. In *one* establishment alone—that of Mr. J. A. Spencer, of Shepherd's Bush—we find that half a million of eggs are used annually in the preparation of photographic papers—rather an alarming fact for our pastry manufacturers, and for very many others who are large consumers of albumen. This fact has been commented upon in the Official Illustrated Catalogue of the International Exhibition in the following paragraphs:—

"It may be interesting to observe that it is one of the productions the demand for which has arisen entirely since the former Exhibition of 1851. At that time photography was quite in its infancy, and few or no pictures were exhibited that could compare with those met with at this moment at every turn. Photographs were then obtained generally from 'paper' negatives, with the exception of a few from 'albumen on glass;' collodion, which is now so generally employed, only having been discovered during the time of that Exhibition, of course had not been brought to the perfection it now possesses.

"The proofs from the negatives thus obtained were exclusively obtained upon what is now called 'salted paper,' being merely good writing paper, saturated with a dilute solution of soluble chloride, or brushed on one side with a stronger solution of a similar salt.

"A year or two after, one of the leading French photographers, observing the universal want of sharpness upon these papers, suggested and made use of papers, the salting solution of which contained various proportions of albumen, the action of which was to keep the material employed in the production of the image upon the *surface* of the paper, instead of, as heretofore, partly penetrating into its substance, thereby insuring a sharpness and brilliancy in the proof that had not been before attainable.

"When this method of preparing paper was first employed, every photographer probably prepared paper for his own use; but experience proved in this case, as in all similar ones, division of labour to be most economical."

Foreign Correspondence.

Paris, June 26th, 1862.

I HAVE read with regret in the last number of the *Journal of the Photographic Society* an article by Mr. Burnett, in which there is some mention of experiments in toning with bichloride of platinum and carbonate of soda, together with much recrimination against two men who have rendered useful service to photography. I mean MM. Nièpce de St. Victor and Lafon de Camarsac. The first mentioned gentleman has already, three years since, been the object of attacks from Mr. Burnett, who accused him of plagiarism, *apropos* of the uranium processes. Now Mr. Burnett returns to that discussion and renews his insinuations, although it has been publicly declared in the name of M. Nièpce that he no-

wise claimed to have been the first to employ the salts of uranium in photography, that he had simply studied those salts from a scientific point of view, and that the application he had made of them to positive printing had been but the consequence of experiments having another object and range. It is therefore clear that our friend in no way pretends to the priority of which his adversary is so energetically tenacious.

As to M. Lafon de Camarsac, his publications go back to 1855, and his photographic enamels were already noticed at the Paris Exhibition. If Mr. Burnett did not see them, he should at least have informed himself about the matter before entering upon a discussion for priority with their author.

I have spoken of the discussion here because, after all, certain historical points, which have their value, are involved, and because it would be regretable for such unmeasured attacks to remain without an answer.

I have just received a letter which causes me, I confess, some sad reflections on the slowness with which we in France profit of the advantages presented by modern discoveries. The letter I speak of, which is from M. Devylder, of Ghent, informs me that public gratuitous lectures on photography have just been instituted in that city. The municipality of Ghent have understood how useful a serious study of photography may be to the industrious classes; the Government has aided in the realisation of this innovation, and at present ninety pupils are already inscribed. The professor, M. Devylder, is a man of instruction and experience, possessing all the qualifications necessary for the mission entrusted to him. It must be admitted that at Paris we are behindhand in this matter. The new art is not, as yet, specially taught in one school. There are certainly some professors of chemistry who, of their own accord, dwell somewhat at length on the most important manipulations of photography, such as M. Edmond Becquerel at the *Conservatoire des arts et métiers*, and his *confrère* of the *Ecole des Ponts et Chaussées;* but that is very different from a practical and connected course of lectures. And yet we know what services photography might render especially to engineers. The order of the Minister of War, which had induced the hope that a course of this kind would be established for the officers of our army, has had for its sole result hitherto the sending a few isolated pupils to Disdéri. It is deplorable that we should be always left behind by our neighbours in such innovations. I know but of one complete public course which has up to the present time been held in France—I mean that which M. Léon Vidal opened last year at Marseilles. Yet the success with which it was attended was of a nature to call forth the initiative of our administrators. Neither teachers nor pupils would be wanting.

You have, no doubt, seen in the *Moniteur de la Photographie* the announcement of a project which is already being realised—I speak of the *Comptior International des Photographes*. The idea seems to me to be a good and useful one. To create a European centre for at least the commerce of photography; to provide that commerce with outlets abroad; to encourage the exchange of productions, and the circulation from country to country of the apparatus and substances employed in manipulations; to maintain permanent international exhibitions in the larger cities; and, in a word, to create an institution which should be a medium of intercourse between manufacturers and photographers, and between the latter and the public, would be to offer to our art very powerful means of development. It is evident that unless such an institution sacrificed everything to the general interest, and placed itself in the most liberal spirit at the service of all, it would miss its aim and fall of itself. From a careful study of this present project, however, I believe it will not miss its aim, and I therefore commend it to the attention of your readers.

From reports I hear, and which I am inclined to believe, I hope soon to be able to announce to you that the great problem of a dry collodion, giving instantaneous pictures, has been finally solved. I am not permitted to say more on the subject at present, and indeed I am even somewhat indiscreet in writing these few words; but it is so agreeable to announce good news, that I have not been able to withhold my pen.

There was much talk here lately of an improvement that, it was said, had been made in heliographic engraving. In the principal journals wonders were recorded of a process due to MM. Baudran and de la Blanchère. I hastened to examine the facts, and I am forced to say that they had been singularly exaggerated. The specimens I saw (two portraits, demi-plate) are well executed, but it is still to the practised hand of the engraver that the result is due. The plates have simply been retouched with skill.

ERNEST LACAN.

Philadelphia, June 9, 1862.

Some few months ago it would have been considered as heresy for your correspondent to have said that the true instantaneous dry plate had not been found in the tannin and hot water; but as time rolls on we find some of the most enthusiastic in its favour still giving long exposures and using cold water. Those who possess short focus quick-working lenses seem to produce very good work with short exposure, such as forty to fifty seconds, in bright sunlight. At the time "Siccus" and "Humidus" made a trial on the rocks and trees of Harlam River, New York, "Siccus" was armed with a Ross's instrument of three or four inches focus, while "Humidus" used a Jamin's view lens, six inches focus. The dry plates had an uniform exposure of two minutes, and were all good; while the wet plates, after the yellow glass window had been covered with two thicknesses of yellow paper, were good, and had not more than five seconds' exposure each, were developed with protosulphate of iron thirty grains to the ounce, and required no strengthening of any kind. The result shows that the wet process then used would, with a suitable instrument, have yielded instantaneous negatives, while the tannin was very slow indeed. The slowness was, however, compensated for by a decided advantage in the portability and comfort of the dry plate arrangement. It has been often remarked that there is a want of uniformity in the result of various experiments with hot water, as proposed by Dr. Draper. Some have advocated the use of water as hot as 200° Fahrenheit, while others say that 80° is the limit of heat to be used advantageously.

A letter (received soon after Dr. Draper's process was made public) from one of our most celebrated amateur photographers, and one who has worked the tannin process since its first introduction, says, under date March 22nd, 1862:—"The hot water and tannin plates do not work in my hands as represented in the journals. A plate which had been sensitised nearly two months was exposed in the camera, behind Jamin's short focus combination, with the usual small stop (aperture about a quarter inch) for thirty seconds. Then one-half the plate was placed in water, just under the boiling point, or about 200° Fahrenheit, for about thirty seconds, tilted slightly so as to wet about one inch beyond the immersed portions. Then the other end was wetted with cold water (about 50°), and the whole developed in a tray with pyrogallic acid and silver, as usual for tannin plates. The result is a good negative on the *cold water* end—a little darker at the centre inch, which had a sudden flow only of hot water (too sudden to heat it); and the hot end is a pale positive, full of details, but very weak. It confirms what was previously known, viz., a moderate increase of temperature is favourable to rapid development, but a high temperature is destructive to the latent image." Continuing the subject of dry plates, he remarks:—"Tannic acid is not expensive in cost, trouble, or temper. I have used the same solution of tannic acid as a bath for *one year* (by the aid of lumps of camphor to prevent mouldiness). See how easy the plates are prepared" [here he sketches a succession of five vertical baths, 1st silver, 2nd, 3rd, and 4th water, and the 5th containing tannin] "and when dried are always ready; but, of course, they are not as quick as the same collodion when fresh by at least one-half, thirty seconds being the least time I have obtained a good negative in: not quick enough to be certain of good figures, but still producing good results for landscape figures, if not portraits." In a letter just received he remarks "that he has used albumen under the collodion with success, and prepares it as follows:—one ounce of albumen, four ounces water, one drachm aqua ammoniæ; and keeps it fresh for months by lumps of camphor." I make the above lengthy quotations from his letters, as they show that his experiments demonstrated what has since been conceded, viz., that the *hot water* must be only about eighty degrees of heat. There is one doubt yet hanging over the subject: people are in the habit of guessing at temperature, and few are aware that the hydrant water in most large cities, during the summer, is constantly eighty degrees Fahr. I know this to be a fact from having spent much time experimenting with Giffard's Injector for supplying water to steam boilers, and the temperature of the cold water was continually noted. If now the ordinary tannin plates are converted into instantaneous dry plates by the use of eighty degrees *hot water*, why have they not always been rapid during the summer months?

Mr. Henry T. Anthony proposes a modification of the tannin plate, which, if it prove quite as good as the few experiments with it seem to promise, he will manufacture for sale as Dr. Hill Norris does. He has intrusted the formula to a few amateurs, and it is now being carefully tried under various conditions. So far it promises well.

Much as the solar camera is used in this country—and there are many in each city—it is surprising how little attention has been given to it by scientific men. Some few have patched up temporary contrivances for the purpose; but none have, to my knowledge, investigated the theory of the condensing lens, and noted what effect it has on the chemical focus of the portrait tube. Some days ago, wishing to possess an enlarged proof from a good negative, it was sent to a photographer who has a very large solar camera, consisting of an eighteen-inch condensing lens (not achromatic) in combination with a half-size portrait tube. The sunlight is reflected into the condenser by a mirror five feet long and twenty inches wide. The negative furnished was remarkably sharp, but the proof returned not at all so. This want of sharpness can only in this case be referred to derangement of the chemical focus. Several good opticians say that the condenser acts only as an illuminator, and can exert no influence over the chemical focus of the portrait tube used in combination with it. This opinion they have given without any study of the matter, as they say themselves. But as far as I have been able to judge myself from the examination of several instruments with chromatic and achromatic condensers, I incline to the opinion held by most of those using the cameras that it is absolutely necessary to use an achromatic condenser, or to correct the focus of the plain condenser so as to use its chemical and not its visual focus. In America the solar camera has become a permanent institution, very few good operators ever taking larger negatives than 8½ by 6½, depending upon their solar camera for even 8 by 10 or larger sizes. In some cases enlarged negatives have been made, from which the proofs are printed directly. An instance of this kind is given by Mr. Anthony, who, having an order for a number of prints of a base-ball club, took to the field his half-size portrait lens, made an almost instantaneous negative, then enlarged it, making a positive glass transparency, and from this glass proof producing in the solar camera a negative of the required size. The reason why this course is not pursued as a general theory is because we have so little cloudy weather that we can depend on using the solar camera most of the time, and there is a great objection to the large silver baths necessary to produce the large negatives. I think I mentioned in a former letter that in making card-pictures from old photographs and Daguerreotypes, the negatives are made quarter-size, then printed life-size with the solar camera. The enlarged proofs are worked up with Indian ink, and from these touched-up proofs the required number of card-size negatives are made. The great fire in Troy, New York, was in full view of the Troy University, and Professors Rood, Emmerson, and Himes have all produced good stereographs of the burned district. They say that the smoke was a source of trouble to them, and that before it had cleared away Yankee enterprise had begun the work of rebuilding. Soon a new city will spring up, phœnix-like, from the ashes of fallen Troy.

A curious race is being run between the engravers and photographers in the publication of portraits of prominent men. Before the advent of card-pictures our generals and popular statesmen were either illustrated by expensive engravings or cheap coloured lithographs. The photographed card-portrait called for a smaller and a cheaper engraving to compete with it. Soon some very good copperplate vignette heads were produced, and sold for about one-half the retail price of the photographs. These are now being copied by second-rate photographers, and sold to the retail dealers at about twenty for one dollar. What will be the ultimate effect of this competition on the art is hard to tell. It results now in the masses being furnished with plenty of good pictures at a low rate. There is continual complaint made by photographers that these card-pictures are ruining this business, that they are driving the ambrotype out of the market, and hence they are losing all the profit they used to make on fancy cases, while the number of persons employed in the principal establishments is increased, and other expenses increased in proportion. In former letters I have mentioned how little is being done with stereoscopic pictures in the market. It is thought that the only proper way to revive this branch of business is to produce some new form of instrument more convenient than the ordinary hand lenticular stereoscope—some instrument so arranged as to admit of loose pictures being placed in it and exhibited in succession.

Mr. Seely says that the next number of the *American Journal of Photography*, which should bear date June 1st, will not appear until the 15th of June, and will be dated July 1st. For this delay he promises good and sufficient reasons, one of which is that he desires the half volume to begin July 1st. He is writing a book, to be sent to his subscribers in place of the delayed number, as a kind of peace-offering. Mr. Thompson, the Secretary of the American Photographical Society, is off to the wars. At present he is located at Baltimore. Being captain of an artillery company in New York, he was one of those who hastened to offer his services when the President made his call for more troops a few weeks ago. This last call, made at a time when little expected, seemed to create just such an excitement as did the first call for three months' volunteers after the fall of Sumpter. With half-a-million Northern men in the field, the wonderful resources of the country were shown when, at a fresh call, three hundred thousand more men responded to the summons.

At the battle before Richmond General M'Clellan used balloons and the electric telegraph in combination, but it was a matter of regret that photography could not have had its share in the *reconnaisance*. Quite an ingenious device has been arranged by a Philadelphian for balloon photography, consisting of camera with an electro-magnetic apparatus attached, so arranged that two plates can be put into the camera at once. The exposure can be made instantaneously by the electric current, and the plates can also be changed by the same means. It was designed to be attached to a small balloon, which could be rapidly sent aloft, held in position by cords, two plates exposed, and hauled down for development.

Dr. Dean, of Boston, spent some time with me on his way from Washington to Boston. He had some very fine specimens of his photographic sections of the *Medulla oblongata;* and in his forthcoming work on the nerves he promises that the illustrations shall all be photographs on albumenised paper. With his microscope he has used both wet and dry plates—the latter were tannin—and his testimony was *decided in favour of the wet for sharpness*, his first impression having been that a hard, dry film would present the best surface for the minutest detail of his subjects; such, however, proved not to be the case, the wet plates developed with iron producing the softest and most interesting pictures. His microscope is one of Smith, Beck, and Beck's; but he does not use their powers, having had made in Boston a three-inch objective. He had great trouble at first from an unequally illuminated field: his difficulty was overcome by placing between the reflecting prisms and the object a common burning-glass (about one inch from the object). The use of this condenser was suggested to him by Professor Rood, and corrected all the fault of unequal illumination.

The remarks in the March number of the *Bulletin de la Societé Francaise de Photographie*, concerning the pictures from Nova Zembla, "that photography by its wonderful results has become in the hands of the missionary one of the most powerful means of conversion in these savage colonies," reminds me of the statement of one of our amateurs. He says:—"Photography is good in a moral point of view. I used to play billiards all day on Sunday: now I spend the same day photographing."

COLEMAN SELLERS.

Correspondence.

☞ We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.

WHAT A LENS WILL COVER.

To the EDITOR.

SIR,—The accompanying photographs (negatives and positives) are, I expect, however rough and faulty, adequate to show two things, each of which appears to be a matter of some interest at the present moment to photographers, viz.:—Firstly, that there is a lens extant which will cover as much and considerably more than the triplet; and, secondly, that *that* lens (not the triplet) has not the distortion imputed to it by some of your correspondents.

Negative and positive No. 1 are from a No. 3 Dallmeyer triplet.

Nos. 2 and 3 are from the patent aplanatic *single combination*.

The nominal (or "back") focus of the triplet is twelve inches. The nominal focus of the aplanatic is fifteen inches. The actual focus of the two combinations may be found (by measuring a small central portion of their relative photographs) to be nearly coincident. Nos. 2 and 3 were done with different lenses, both being aplanatics. The stop used with the several lenses had invariably four-tenths diameter of opening.

In taking negative No. 2, the stop was approached a quarter of an inch nearer to the lens than what I call the "best distance." This gave a picture of equal size with that of the triplet lens.

In taking negative No. 3, the stop was approached as close to the lens as the mounting ("the portable mount") admitted. The camera was always close to the same window, and negatives Nos. 1 and 2 were taken on the same evening—No 2 last, and after 5 p.m. The exposure was made as nearly as possible the same (allowing for the estimated difference of the light).

Now, the first point to which I have alluded, viz., that the aplanatic can be made to cover a larger field than the triplet, is evident from comparison of photographs Nos. 1 and 3; and, as the true photographic focus for a field of small angular dimensions of all the lenses used is about 14⅛ inches, and a field of ten inches includes about forty degrees, the "displacement" of objects (by the single combination) for a field including forty degrees can be ascertained approximately by measuring the distance of any two definite points in the image (each about five inches from the centre and ten inches asunder) of the photograph taken with the triplet lens (of no distortion), and comparing that distance with the distance between the corresponding points in the photographs taken in the single combination. If there were really four degrees of displacement at each side in a field of forty degrees, as has been asserted, then the distances taken as above directed should prove to be as ten to eight. I estimate their ratio at little more than a sixth part of that.

There are two other points of comparison which, although I touch upon, will be more satisfactorily discussed on other occasions. One of these is the superior intrinsic intensity of the single combination, which appears to ooze out in comparing photographs No. 1, and 2; but of this, I admit, there can be no certainty established except from simultaneous exposure.

The other of these points is of a much more decided character, and respecting which there can be no mistake, although in some degree masked by the roughness of the image—due to old materials, including paper at least two years iodised—viz., that, in the negatives especially, there may be observed a very great difference in the distinctness of the lateral portions in favour of the aplanatic lens.

I had nearly forgotten to mention that the larger photographs of 17 by 14 include, in the case of those marked 2 and 3, about 65 degrees in the longer dimension, and that the two prints of 10 by 8 inches, from a 10 by 8 collodion negative, taken with a seven inches focus lens, include 73 degrees in the longer dimensions — the diameter of the stop used being exactly $\frac{2.5}{10.0}$ or ¼-inch diameter.—I am, yours, &c., THOMAS GRUBB.

Dublin, May 29th, 1862.

[We took the preceding letter and illustrative photographs to the last meeting of the Photographic Society with the intention of exhibiting the latter, but there was no opportunity of so doing, the sitting having been unusually protracted, and anything like discussion almost entirely suppressed. The following particulars of the proofs received must therefore suffice for the present; but, should any of our readers desire personal inspection, we will endeavour to afford it.

Three of the prints are upon paper of 17 × 14 inches dimensions, the impressed parts occupying about half-an-inch less each way. The negatives of Nos. 1 and 2, which accompany the proofs, are upon waxed-paper, and therefore, to those accustomed to collodion, the comparative want of "sharpness" is annoying. The foci of the several lenses employed are remarkably near to one another—two corresponding points in each of the proofs measuring respectively—

In No. 1 (by the triplet) ..... 7⅝ inches.
In No. 2 (by aplanatic) ..... 7⅞ ,,
In No. 3 (do.) ..... 7⅝ ,,

There are four dark corners in No. 1 and No. 2, the extreme diameter of the circle, including penumbra, being in both cases about eighteen inches; but in No. 1 (by triplet) the penumbra is somewhat more encroaching. No. 3 has no dark corners, but the image is perfectly visible up to the extreme angles. With regard to lateral definition, Nos. 2 and 3 are certainly superior to No. 1; but in *all*, as we have before remarked, the medium employed leaves much to be desired.

With regard to "displacement of the image," we find the extent to be as follows, viz., points distant 10⅝ inches in No. 1 are but 10⅜ inches in Nos. 2 and 3. The whole extent of field in No. 1 occupies in No. 3 *seven-eighths of an inch less*, so that the displacement increases rapidly as you extend the field. In general landscape subjects this is quite immaterial, but for architecture it would probably be objectionable.—ED.]

MR. WALL DEFENDS HIS CHINA SHOP.

To the EDITOR.

SIR,—I could very contentedly leave the matter of dispute between Messrs. J. T. and G. Bull and myself in the hands of your readers, were it not that these gentlemen have thought fit to characterise my comments upon their "artistic backgrounds" as "unjust and unjustifiable."

Perspective and drawing are not mere matters of taste; and when I assert that their simplest rules are violated in certain productions, ten out of every twelve educated persons who inspect the same can, if they so please, either convict me of error or convince themselves of my veracity. For instance, everybody knows that the vanishing point* is on the horizontal line, and that the horizontal line, or line of the horizon, indicates the height of the spectator's eye; and, therefore, when everybody sees the profile accessory (say it is *a bookcase)* with lines which should converge to a point *upon* the horizon going ambitiously upwards to some point a very long way *above* the horizon, why *everybody* will say *that* is a great mistake, being such a view of the bookcase as a bird would command, and not such as we poor "earth-treading mortals" usually obtain. Again: a moment's thought will tell even those who are profoundly ignorant of perspective that we see more of the top of anything the lower it is placed, and that when it is exactly level with the eye the top is no longer visible—a rule which, simple as it is, these backgrounds invariably ignore, giving in flights of steps ascending to within but a short distance of the horizontal line as much space to the top of the bottom step as to that of the highest, &c., &c.

In conclusion permit me to recal an anecdote told of that once talented and admired actor, the elder Kean. Being on the stage the audience, to express their sense of certain private matters then just made public, began to hiss with a thousand-goose power, but paused when, advancing to the footlights, the great tragedian reminded them that *they* were there to judge his acting, not his private character, and that *he* was there to act, and not to defend himself from detraction and slander. Seeing at once that it was not "*fair or in good taste*" to persecute the actor in his public career for matters belonging purely to his private life, the audience, it is said, ceased hissing and the play proceeded without further interruption. The application of this anecdote I leave to your readers and to the Messrs. Bull, merely adding that it is not usual to accuse others of meanness or of prostituting their pens to the advancement of injustice and the propagation of falsehood without some better authority for doing so than is to be found in mere possibility, or even probability; and that those who would so abuse their privileges, and so use their pens, would be more likely to do so behind the shield of the anonymous than to emulate the example of yours, &c.,

35, *Westbourne Grove, Bayswater.* ALFRED H. WALL.

* Sometimes, but incorrectly, called the point of sight.

MANIPULATIVE QUERIES.

To the EDITOR.

SIR,—Will you kindly answer the following queries in your next issue?

1. What is the best material for a portable background to give a medium colour in the positive print? I should like to obtain something suitable without the addition of colouring, if possible, unless you can recommend a dye which would answer the purpose—colouring matter which would rub or peel off being objectionable.

2. In the intensifying of negatives with iodine, pyrogallic acid, and silver solutions, is it essential or better to expose the negative to daylight after applying the iodine and before the application of the pyrogallic developer? I find it so ordered in *The British Journal Almanac* for the present year, but not named in the papers read before the various societies.

3. Is the solution recommended by Mr. M. Lyte, and published at page 120, Vol. VIII., of THE BRITISH JOURNAL OF PHOTOGRAPHY, for decolouring the nitrate bath for albumenised paper, uninjurious to the nitrate solution? I find that the sensitising of papers subsequently still colours the solution, and therefore wish to know if the continued use of the decolouring agent is at all injurious, and also whether you think it preferable to the method recommended by Mr. Tunny for the same purpose, to wit, citric acid?

4. I have spoiled about a quart bottle of collodion by the admixture of iron developing solution. I suppose the only remedy is to throw it away. Also some nitrate of silver solution by the addition of phosphate and acetate of soda instead of phosphate and carbonate. Please say what I can do with this. Apologising for this trouble,—I am, yours, &c.,

Liverpool, 6th June, 1862. INEXPERIENCE.

P.S.—In answer to a correspondent in your last number you say that the returning to the bottle, for subsequent use, of hyposulphite of soda bath would be "a sure foundation for a number of faded proofs." Am I to understand that the immersion of two or three prints renders the bath unfit for future use, provided this was the extent of my requirements at the time of its preparation?

[1. A blanket for a light one, a piece of green baize for a dark one—the darkness depending on the yellowness of the green.

2. Decidedly better, if not indispensable; probably not named because the operation is frequently performed in the light.

3. The addition of anything to the nitrate of silver bath to decolourise it weakens it to a small extent, and therefore it is not advisable to do it oftener than needful. Mr. Maxwell Lyte is an experienced chemist, but we are not aware that the plan he proposes is better or worse than that employed by Mr. Tunny. If you coagulate your albumenised paper by floating it on alcohol—methylated will do—and drying it, you will probably find your sensitising bath not discolour so rapidly.

4. Your collodion, we fear, is quite useless. The nitrate of silver you can use for printing, or precipitate the silver by the addition of an iron developer. Wash the precipitate and redissolve it in nitric acid.

5. We do not advise the use of hyposulphite of soda for more than one day; but by keeping some chalk in the solution you may, to a considerable extent, guard against the ill effect of using it over again.—ED.]

IMPURE HYPOSULPHITE.

To the EDITOR.

SIR,—I have been much troubled lately in printing owing to the impurities of the hyposulphite of soda. I have purchased three different samples with the same result. On dissolving it in distilled water, a white flake precipitate is thrown down in large quantities. It injures the white of the picture, causes an eruption of blisters (on the paper), and is alkaline. Have you met with it or heard of it before?—I am, yours, &c. H.

June 16th, 1862.

[We have neither met with the annoyance personally nor have had complaints about it.—ED.]

A PRINTING ACCIDENT.

To the EDITOR.

SIR,—A few days ago I was mixing citric acid and silver for the tannin process; at the same time, also, some bath solution for paper; and filtered the latter with the same filter-paper as the former had just gone through. In printing I observed much less time was required than the same negatives had previously taken. The day was cloudy, and not at all good for printing. The parts darkened were a red-brown. I enclose you one print of those referred to, the right one of a stereograph of *Scrooby Church*, which is historically connected with America, it being from Scrooby, and Austerfield, a village about two miles from it, where the original founders, the Pilgrim Fathers, were natives, and proceeded from. If you think it would in any way interest your transatlantic friends, I shall be happy to exchange with them stereographs of both the above.—I am, yours, &c.,

Bawtry, June 21, 1862. HENRY PERCY.

[The effect produced is precisely what might have been anticipated. Possibly our American correspondent, Mr. Coleman Sellers, may respond to the proposal.—ED.]

COLLODION.

To the EDITOR.

SIR,—Encouraged by the kind replies that you give in THE BRITISH JOURNAL OF PHOTOGRAPHY to all kinds of photographic queries, and finding myself "in trouble," I have taken the liberty of forwarding to you by this post a small bottle of collodion, part of some which I prepared very carefully, and with as pure materials as I could obtain (*absolute* alcohol, &c.); but, although it looks very well, I have not been able to get a picture with it, as I find that it fogs under pyrogallic developer, and only after a very lengthened exposure is a slight outline visible.

The collodion has been iodised about three or four weeks—about four grains iodide of cadmium to the ounce; and, as I have prepared a tolerably large quantity (for an amateur) I shall be extremely obliged if you can suggest a remedy.

Apologising for so troubling you, I am, yours, &c., W. B. C.

Liverpool, 23rd June, 1862.

[Your collodion requires more pyroxyline: it is not possible to give a definite quantity that will always suffice, as the pyroxyline, however carefully made, will vary a little. We think you may add about two grains more to each ounce of collodion; but you should also add to the mass of which you have sent us a sample a few drops of diluted tincture of iodine, just enough to turn the collodion of a faint straw colour, and we apprehend that your troubles will be removed.—ED.]

PANORAMIC STEREOGRAPHS, &c.

To the EDITOR.

SIR,—Will you kindly answer, through the medium of THE BRITISH JOURNAL OF PHOTOGRAPHY, the following queries:—

1. Where can I find a description of Dr. Henry Draper's hot-water process?

2. I use a transfer-box; and, for drying tannin and honey-tannin plates before putting them therein, I use a common light-tight plate-box, with a ventilator, which requires considerable heat to dry them thoroughly. Were I to shut it close and put a vessel of *lime* or *potash* inside, would that sufficiently absorb the moisture and dry them without having any deleterious influence on the sensitive surface? and what would be the best substance to use?

3. Why are stereographs always made of such a small size? I can bring together with my eyes two pictures of a much larger size than the standard ones, and I see no reason why *refracting* stereoscopes should not be made to hold larger pictures.

4. Can stereographs be taken with the *panoramic* lens of the full size (of course, however, on separate plates)? If so, though the stereoscope could not take in the whole picture at once, a very simple piece of mechanism fixed to the ordinary stereoscope (and which when not required could be removed) would show them like a moving panorama. In taking stereographs from an elevated position (with, it may be, a beautiful panorama all round), the great drawback is the comparatively small angle one view will take in; and even should separate slides be taken, it is difficult, when viewing them, to preserve the connexion of one with the other. With this proposed arrangement however, such views, taken from the same station, by simply moving round the camera so far between each picture (or what would be much better, if practicable, taken with the panoramic apparatus), could be viewed, as I have before said, as a moving panorama. It can be adapted to any length of joined pictures, and I am only sorry I have not time to write a description of the addition I would propose; but, should you desire such, I shall be happy when I have leisure to do so.

I am sorry to trouble you with so many questions, but hoping that in an early number of the Journal they will receive your attention,—I am, yours, &c., PANORAMIC-STEREO.

Haddington, June 17th, 1862.

[1. In the *American Journal of Photography*—though it is rather a joke to call it *Dr. Draper's* process; his modification of Major Russell's directions being confined chiefly to the suggestion of plunging the exposed plate into warm water prior to development.

2. You might use, probably with advantage, a glass vessel full of sulphuric acid to absorb the moisture.

3. Most persons cannot combine larger pictures, and indeed there is little occasion to do so; for, provided that they be viewed at a distance of six inches (by aid of lenses if needful), they appear of natural size.

4. Stereographs can of course be taken with the panoramic lens, and we believe its inventor has in contemplation the contrivance of a stereoscope in which to view them. We shall be happy to receive a description of your ideas on the subjects.—ED.]

ANSWERS TO CORRESPONDENTS.

RUPERT.—Received with thanks.

A. B. C.—You will find Mr. Hockin's *Manual* fulfil your requirements.

J. O. and C. L. F.—We will endeavour to meet your wishes in an early number.

ROVING ROB.—Perhaps upon the whole the tannin process would suit your present requirements best.

CHAS. REID.—We do not prefer an iron developer in warm weather, but do so decidedly in the winter time.

G. B.—Of the three artists (!) which you name Nos. 1 and 2 can only be so designated by courtesy: go to No. 3 by all means.

LOTTY.—Apply to the stain a few drops of the following, viz., solution of cyanide of potassium, with a few drops of tincture of iodine added.

MATTHEW.—Pneumatic holders are of various forms, but most can be procured of any of the dealers in apparatus either in London or in the provinces.

AMATEUR No. 2.—We regret to learn that you have been treated rudely at the establishment you mention; but you know the old adage, "You cannot make a silk purse of a sow's ear."

W. J.—We know of no practicable plan of filtering a solution of India-rubber in benzole unless it be very fluid, in which case it might be done through a stratum of pounded glass or fine-washed silver sand.

R. F.—We are obliged for the specimens received, but as we cannot notice them favourably we remain discreetly silent: you are far behind your competitors in the branch of photography which you have selected.

C. JONES.—It is quite immaterial whether your protonitrate of iron is made by aid of nitrate of barytes or nitrate of lead, so far as the ultimate product is concerned: it is merely a question of convenience in the production.

M. D.—If your sample of gold salt is really neutral to test-paper there is no absolute necessity for the addition of carbonate of soda; but we never found a sample that was not acid, except the double salt of gold and sodium.

JAMES G. MACANDREW.—Your communication having been sent to the address of the Publisher, instead of the address of the Editor, has prevented its insertion in the present number, but it shall receive due attention in our next.

EQUUS.—The best plan to adopt in taking portraits of horses is to prepare everything in the ordinary way, and just before the moment of exposure to get an assistant to sound a *shrill whistle*, which appears to attract the attention of horses and renders them for several seconds immovable in an attitude of attention.

REUBEN.—We shall be happy to publish your formula provided that it contains any *valuable* novelty; but if it is merely a novelty without any special advantage, we do not perceive its utility. However, if you forward it, you must leave it to our judgment to deal with as circumstances demand: we cannot pledge ourselves "in the dark."

PROVINCIAL.—We are informed by one of "our staff" who is frequently there, that the lofty lumber-room devoted to English photography in the International Exhibition *is* visited by a few on the one shilling days. Our foreign neighbours have been "wise in their generation" in having declined to contribute to a general gallery.

A. S. T.—The *Traité Populaire de Photographie*, by Dr. Monckhoven, could no doubt be obtained of Ballière, in Regent Street, and the price would be probably about four shillings; but Messrs. Horne and Thornthwaite, of Newgate Street, have purchased the English copyright, and it will probably be presented in our own language shortly.

DOUBTFUL.—We have no doubt that if you apply to Mr. Dallmeyer direct he will tell you whether the lens is one of his manufacture. We fancy he never sends one out without his name and a number attached. His *carte de visite* lenses have been highly spoken of by some of our best operators, therefore we think you have been deceived in the one you have been offered.

VERDANT GREEN.—Your's is a case of *mealiness*—not measles, the causes of which are various; but *old* prepared albumenised paper is a prolific one. We apprehend that there is a deficiency of chloride in the albumen. Some operators declare that immersing the proofs in a bath of acetate of soda before the toning bath is a good remedy; but we are sceptical relative to the accuracy of their observations. We should recommend re-albumenising the paper.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 170, Vol. IX.—JULY 15, 1862.

Enlargement of Photographs.—The problem of how best to amplify photographs is one which gathers importance day by day, more especially with respect to portraits, and also landscape scenery in which living objects are included. From the earliest introduction of the calotype process the idea has been constantly "cropping out;" and though from time to time evaded in consequence of certain difficulties which have required time, perseverance, and intelligence to overcome, the solution of the problem cannot be much longer postponed, because while the demand for instantaneous subjects continues to increase, it is coupled with a desire to obtain pictures of a size that do not require the aid of a lens to display the beauty of the details. There are many reasons why the fulfilment of the conditions needful to obtain productions of the kind indicated involve the use of lenses of short focus for taking the original negatives, some of which we now propose briefly to glance at—we mean the reasons, not the negatives.

If we desire to take a picture of an object, or number of objects, located in a plane or shallow concave surface, we may employ for the purpose, without detriment a lens of considerable diameter, provided that it be well corrected for spherical and chromatic aberrations, and consequently its focal length may be proportionally long; but if the subjects to be depicted be not located in one plane or concave surface, having on the contrary considerable variations of distance, then no perfection of the lens can compensate for the confusion arising from the extent of variation in the points of view as reckoned from one margin of the lens to its opposite side. This is a fact so readily demonstrable that we are surprised at any one not at once perceiving it. For instance: suppose we are using a double combination lens of (say) four inches in diameter; if now we cover up the lens with a piece of cardboard, cutting a circular aperture or merely a segment off from *each* side of about one and a-half inches wide, the centres of these apertures will be two and a-half inches apart. A pair of stereographs may be taken with such an arrangement upon two separate plates in succession, by merely exposing first with one segmental opening and then with the other. Now, nearly every photographer is aware that the two stereographs forming the pair differ in the relation of certain corresponding points to one another, so that if we place one picture over the other, and view the two by transparence, if certain points coincide, others cannot do so at the same time. If instead of taking two stereographs in succession we expose one plate by opening both segmental apertures simultaneously, we produce a negative resembling the two pictures superposed as before described; but if we use, instead, during exposure the whole aperture of the four inches diameter lens, we add still further to the confusion by in effect superposing a number of other pictures, each one differing somewhat from the two first supposed. It is clear, then, that in order to avoid this confusion we must reduce the effective aperture of the lens. All this has been insisted on years ago by Sir David Brewster, though we are not aware that he put the matter in a popular form, and certainly he coupled with his demonstration a recommendation which was at the time impossible for professional photographic portraitists to have adopted if they hoped to earn their bread at the same time. The fact pointed out was, however, none the less true.

If we reduce the actual aperture of any given lens, we reduce its *angular* aperture, and consequently the intensity of the image formed at its focus, at the same time; or, in other words, the more acute the point of our pencil of light, the less intense is the line that it will draw—the more obtuse, the darker the line we can make. It is evident that a pencil of small may be cut with a point as acute or as obtuse as one of large diameter, and so it is with a pencil of light; but in both cases the *length* of the cone will be greater with the large pencil than with the small one. If then it be needful to employ pencils of small diameter in order to avoid confusion arising from difference of points of view, and to use large *angles* of aperture in order to ensure intensity of the image, it follows as a necessity that the focus *must be short*, or our conditions are not fulfilled. For the production of instantaneous pictures intensity of the image is no less a *sine quâ non* than sensitiveness of the chemicals; in fact, we must endeavour to ensure the combination of as many favourable circumstances as possible, in order to have any chance of producing "instantaneous" results. One step more and our train of argument will be complete. Short focus lenses imply not only small-sized pictures, but images depicted upon a small scale, two conditions not otherwise necessarily connected; if, then, we desire large pictures including objects in motion—as with the existing state of our chemical knowledge we are unable to produce films of sufficient sensitiveness to receive an impression from very acute pencils of light—we cannot dispense with a lens of large angular aperture, and therefore, following out the chain of reasoning adduced above, we must produce small negatives, and consequently must also, to attain our end, subsequently enlarge them. Time and space forbid our carrying on the subject further in our present issue, but we hope to do so in our next.

Royalty Honouring Photography.—We feel considerable gratification in being able to announce to our readers that H.R.H. the Prince of Wales has just been elected President of the Amateur Photographic Association, he having in the kindest manner signified, through the Earl of Caithness, his consent to confer this distinguished honour upon that body—an honour the more to be appreciated in consequence of its being the first of the kind emanating from the future sovereign of these realms. And, indeed, it is not alone amongst the members of the Association that it will be a cause of rejoicing; but every follower of the photographic art will participate in the satisfaction which such a gracefully courteous act of condescension implies, namely, a deep feeling of interest in the progress of photography.

Her Majesty the Queen has always been a kind patron of our art, and her late Royal Consort was so keen a follower of it that photographers especially experienced a double cause of sorrow at his decease. That his eldest son should endeavour to fill the void left by his Royal Father in this, as in more important matters also, was, perhaps, more than our brethren of the camera could reasonably have expected; and therefore they will no doubt appreciate in a higher degree the fact that the young Prince is himself a member of their fraternity.

Our readers will find in our usual columns recording the Meetings of Societies a report of the meeting at which the Prince of Wales was elected. While on the subject of the Amateur Photographic Association, we may mention that, in accordance with a permissive regulation, the recipients of prizes for the first year of its existence elected to receive, instead of medals, the following articles, bearing appropriate inscriptions, viz.:—

Article.	Recipient.
An elegant claret jug	The Earl of Caithness.
Ditto	Lieut.-Col. Shakespere.
An antique silver inkstand	Wm. Church, Jun., Esq.
A pair of silver goblets	Major Gresley.
An elegantly engraved silver goblet	H. St. Vincent Ames, Esq.
A silver inkstand	George S. Penny, Esq.

On perusing the official report of the last meeting we notice an omission, no doubt arising from the modesty of the Hon. Sec., Mr. A. J. Melhuish, whose duty it is to issue the same: we mean the warm commendation accorded to him by the Council for the very efficient manner in which he has performed his duties during the past year—his services being the more worthy of recognition from the honourable and judicious way in which he has kept scrupulously distinct his identity as a member of the firm to which the printing for the Association has been entrusted, and his office of Hon. Sec., in which he has acted entirely as the intelligent and efficient agent of the Council. We have deemed it but an act of simple justice to him to put this fact on record, knowing that there is no other person having a knowledge of the facts in a position to do so, except by directing Mr. Melhuish to insert in the official report of the next meeting that which he might feel some delicacy about doing regarding himself.

A "Note" on Literary "Annexation."—We regret to find that some of our photographic contemporaries, when pushed for matter wherewith to fill their space, are not contented with begging and borrowing it in every direction, but have latterly taken to——well! suppose we call it appropriating without license or acknowledgment, by way of putting the case mildly, after President Buchanan's method of designating "slavery" by the phrase "involuntary servitude."

It is no wonder that American phraseology arises in our mind in connexion with this subject; for, not long since, when remonstrating against the injustice of which we complain in another quarter, we were curtly informed by the editor who dealt with our property in the way "which the wise *convey* do call," that he had no intention of not acknowledging the articles, but that he should do so, according to *the American method*, at the *end of the series*. Now, as some of the articles "involuntarily contributed" are each complete in themselves, and are merely, for the sake of convenience, put under a common heading—as, for instance, "Notes on Photographic Chemicals"—without any one necessarily being at all connected with any other, and moreover, as the "series"—if it can be so designated—may possibly last for *several years*, our readers can judge what sort of acknowledgment we are likely to obtain.

Until recently we have not had reason to complain of similar unfair treatment at the hands of our English contemporaries, one excepted; but of late the depredations have increased to such an extent that we are not inclined to remain silent on the subject any longer. So long as the nefarious practice was pursued only by a little "penny trumpet" it did not much matter; but when the editor of our weekly contemporary, the *Photographic News*, stooped to lay violent hands on articles and reports of meetings from our columns, and when on our privately remonstrating with him he professed to regard his insertion of the words "abstracted from the organ of the Society" at which such paper was read as a concession to our squeamishness (!), we certainly imagined that we had seen the worst phases of "involuntary contribution" in our own country. But we were mistaken. Even our old antagonist, the editor of *Photographic Notes*, abstained from this injustice, at least; and, although he has in two recent numbers of the periodical over which he presides copied, *verbatim et literatim*, the report of a meeting, and an article to which we shall presently allude, without any acknowledgment of the source whence derived, we believe that he has done it under a misapprehension of our right, influenced by the unwarrantable conduct of "our London contemporary;" and further, we do not doubt, that if we were to point out to him the facts of the case, notwithstanding his inimical feeling towards us personally, he would, without hesitation, make the acknowledgment due. Our reasons for entertaining these opinions are simple enough. Although the editor of *Photographic Notes* copies largely from foreign journals, when he judges the matter to be worthy of reproduction, we do not remember ever having detected him so doing without honourably notifying the source of his information in plain terms; whereas the present editor of the *Photographic News* has done so, and continues to do so, repeatedly without acknowledgment. To give one instance, out of many, we may point to an article a portion of which appeared in the last June number of the *News*, translated from *Le Bulletin Belge de Photographie;* and in the same number he gives the whole of an article which appeared in our issue for the 15th ultimo, *contributed by Mr. Dawson as one of our staff*, and this without any kind of acknowledgment, except a casual allusion, at the commencement of an article of his own in a previous column, to "our Liverpool contemporary." Why Liverpool contemporary? Why not Manchester, or Birmingham, or Edinburgh, or, for that matter, London (for our constituency in the metropolis is much larger than in the other localities named), unless it be to disguise the identity of The British Journal of Photography?

If the distinction between *meum* and *teum* be so very obscure in the mind of one who, being on the spot with us, knows well enough that he has *no right whatever*—not even a shadow of pretence of right—to the article appropriated, is it surprising that an editor at a distance, perceiving that the said article appeared also in a journal other than our own without acknowledgment, should imagine that there was no special property existent therein?

The editor of the *Photographic News* has assumed a right to appropriate what he may please of any articles read in public, and with or without the consent of the authors, whether he may have been present at the reading in person, or by proxy, to take notes or *not*.

We shall not stop to discuss this assumption at present, but it is certainly a new feature in periodical literature for an editor to appropriate in the unceremonious manner adopted by the conductor of the *Photographic News* an article from a contemporary that has never been even read in public—and more, which has been contributed, under a business arrangement with its author, exclusively for our own pages. We have as much right to reproduce one of our contemporary's leading articles with comments of our own, and a mere casual reference to "our London contemporary," as he had to act in the manner of which we complain. The evil does not stop with his publication. We have upon more occasions than one seen reproduced in foreign journals articles thus unfairly appropriated, and in them accredited to our "abstracting contemporary," who even so recently as in his first July number reproduces without acknowledgment an article (which will also be found in our current number) from the pen of one of our foreign contribu-

tors, from whom we have a communication drawing our attention to the fact, and stating that he (the author) did *not* give any copy, or permission to copy, to our too industrious appropriator. The editor of the *News* borrows so largely from the columns of our American contemporaries that he has no doubt in his own mind adopted the "American style," and, as usual in a new convert, gone a little beyond. To avoid misconception we would here remark that we are well convinced there are honourable men in America as elsewhere, but certainly we have been unfortunate in our experience of the editorial portion hitherto: it is not in one but in two cases in which we have been met with the "American style" of reply.

We have a notion that the contemporary of which we now complain has already discovered that he has in the special instance to which we particularly advert gone a little too far; for in his number last cited we find the almost unprecedented circumstance of two reports of meetings fairly acknowledged. Is this intended as an attempt to disarm our just indignation?

One remark more before we close. We are informed that it is a practice amongst some newspaper officials to copy reports of certain public meetings from one another without special acknowledgment, because such reports are not taken for any one paper specially, but by reporters on their own account, who supply copies to all comers for a consideration. This is not the case with us. We employ gentlemen to take special reports *exclusively* for our use, where they are not furnished officially by the secretaries of the societies the meetings of which are reported; and in the latter cases they are also *exclusively* supplied—hence our undoubted property even in these reports. Finally: we never have objected to any amount of appropriation from our columns—and in some cases they are habitually drawn upon to a pretty heavy extent; but we must append the condition that in all cases our consent is accorded only when a simple acknowledgment is made to—THE BRITISH JOURNAL OF PHOTOGRAPHY.

SCIENTIFIC PHOTOGRAPHY.

By M. D. VAN MONCKHOVEN.

ON INTENSIFYING NEGATIVES.*

IN our preceding article we have given the theory of ordinary intensifying, and alluded briefly to several points in the theory of the production of photographic images. In an article to appear very shortly we propose presenting to the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY a complete statement of our ideas on this subject. Our present intention is to give an explanation of the other methods of intensifying used in photography, both past and present.

If the proportions given by good writers for the preparation of collodion, nitrate baths, and developers, be carefully followed, and if the time of exposure be exactly suited to the subject which it is desired to reproduce, it will be found that the negative never requires any intensifying; but it happens under some circumstances—for example, when the exposure has been too short—that the dark parts are wanting in vigour. It is in such a case that the following methods of intensifying will be found most appropriate. Not that we wish to say that they *should* be employed, but that they *can* be when necessity arises; and it is from a scientific point of view only that we propose to examine the subject.

1. The plate is immersed in a bath of bichloride of mercury for a very short time: the silver constituting the image becomes of a blackish-violet. The following is the change which takes place:—We have silver on one side, and a bichloride on the other. The chlorine combines with the silver, changing it into a violet subchloride. This film placed under a red glass becomes red, and blue under a blue glass. In one word, it is susceptible of taking the colour under which it is exposed to light, and is the same violet chloride which was used in the heliochromic experiments of MM. Becquerel and Nièpce de St. Victor. It is unnecessary therefore to say that a glass thus intensified soon changes by exposure to light. The bichlorides of copper, titanium, tin, diluted aqua-regia, bichloride of platinum and palladium, act in an exactly similar manner, as is represented by the following equation, in which M is a metal, or a radical analogous to a metal:—$M\,Cl + 2\,Ag = Ag_2\,Cl + M\,Cl$.

* Continued from page 248.

Let us continue with the example of the bichloride of mercury, as that is the substance which is generally used for this purpose:—

If instead of leaving the film for only a very short time in the solution, it be allowed to remain much longer, it whitens and becomes very opaque, and this arises from the fact that the *sub*-chloride first formed continues to absorb chlorine passing into the state of white chloride. Further, the protochloride of mercury liberated is also deposited, and the silver of the film becomes finally a mixture of chloride of silver and protochloride of mercury.

$$Ag + 2\,Hg\,Cl = Ag\,Cl + Hg_2\,Cl.$$

Such a plate would seem to be very sensitive to light: it undergoes change, however, but very slowly. It is known, in fact, that the salts of silver in presence of the salts of mercury alter very slightly, and this is regarded as a proof in favour of the hypothesis that light changes them into sub-salts.

It is possible subsequently to change the chlorides of silver and mercury into black or yellow salts, possessing sufficient impermeability to light to admit of the printing of positives. One of the methods consists in diffusing over the film recently washed and while still moist a current of sulphuretted hydrogen gas, which displaces the chloride with formation of the black sulphides of mercury and silver, and hydrochloric acid, which latter evaporates during the drying of the plate.

$$2.\ HS + Ag\,Cl + Hg_2\,Cl = 2\,H\,Cl + Ag\,S + Hg_2\,S.$$

After this, light has no sensible action, and this way of intensifying is the most vigorous and successful known. Instead of sulphuretted hydrogen any other sulphurising bath may be used—solutions of the alkaline sulphides, sulphide of ammonium ($NH_4\,S + HS$), and hyposulphite of soda; but generally the blacks are not so vigorous as when sulphuretted hydrogen gas is employed.*

The application of ammonia after the action of bichloride of mercury gives also an intense black film, which is, however, soon altered by light. The reaction probably gives rise to the formation of the compounds of mercury represented in the two following formulæ:—$Hg_2\,O$ and $Hg_2\,Cl + Hg\,NH_2$. These two unstable bodies are easily altered by light.

Instead of blackening the mixture by sulphuretted hydrogen it may be rendered yellow by treatment with an alkaline iodide. *This is the only instance known in chemistry in which iodine displaces chlorine.* Attention has, however, been recently directed to this fact by an illustrious chemist, although in 1856 it had been already recorded at page 204 of our *Traité Generale de Photographie.*

On being withdrawn, then, from the bichloride of mercury bath the washed plate is submitted to the action of a solution of iodine or iodide of potassium, when the chloride of mercury instantly changes to the state of yellow iodide; and, as the reader will know, the yellow salt exercises an influence on chemical light precisely analogous to black. Silver seems to enjoy the same property.

This method of intensifying—so curious in a scientific point of view—is practically worthless: the iodide of mercury slowly volatilises, and at the end of a few months the image is composed solely of iodide of silver.

3. We stated at the beginning that, generally (and with reason), the use of bichloride of mercury had been abandoned.

It is possible to sulphurise the silver directly, by means of a solution of hydrosulphate of ammonia, or an alkaline sulphide; or, better still, by pouring over the plate a solution of ten grains of sulphur in one pint of bisulphide of carbon. In either case sulphuret of silver is formed, and this of all salts of silver is the most permanent.

4. A diluted solution of chloride of gold, or chloride of gold and sodium, poured upon the plate after fixing and washing, communicates to the negative the highest degree of opacity. It is best to use a very dilute solution of gold, poured into a flat glass dish, in which the plate can be allowed to remain several minutes.

The silver constituting the image evidently acquires a very thin film of gold, while other portions seem to pass into the state of violet chloride, without which there would be nothing to prevent the quantity of precipitated gold from being too great. On removing and analysing the film, variable proportions of silver, gold, and chloride are always obtained. The following is the equation which represents the decomposition:—

$$6\,Ag + 2\,Na\,Cl\,Au_2\,Cl_3\,4\,HO = (Ag_2\,Cl)^6 + 2\,Au + 2\,Na\,Cl$$

* The opinion has been very generally received that all paper proofs, either positive or negative, formed of sulphide of silver, must needs undergo spontaneous change. We have, however, some prints composed of sulphide of silver which have remained permanent for several years. Many hypotheses have been offered on the sulphurisation of prints by old hyposulphite baths. Messrs. Hardwich, Davanne, and ourselves have written and published a great deal on this subject; but the sulphuric-acids are so little known that we have probably taken the effect for the cause. In our new work we shall entirely modify our published ideas on this point.

The bichlorides of platinum and palladium act in an analogous manner.

The foregoing includes, in a few words, the theory of intensifying negatives. Many other methods have been proposed and followed; but, scientifically speaking, they are included in those cases we have already described.

In our first article we have touched on several points in the theory of the action of light on iodide of silver. We are at present re-arranging all our manuscript, and in an early number of this Journal we shall publish a summary of our knowledge on this subject.

PHOTOGRAPHIC PRINTING ON ALBUMENISED PAPER.*

By George Dawson, M.A.,

Lecturer on Photography at King's College, London.

The *Sensitising Bath* may be made of the ordinary crystallised nitrate of silver, and should be of the strength of ninety grains to each ounce of distilled water. Indeed this kind of silver is better suited for the purpose than the fused or recrystallised neutral nitrate, inasmuch as the former has not had all the free nitric acid expelled, a considerable trace of which it is important the bath should contain. Hence, the bath ought to be tested, and, if neutral to test-paper, one drop of nitric acid added for every three ounces of solution. It is rapidly weakened by use, and should never be allowed to get below seventy grains to the ounce. This point may be readily ascertained to within a grain or two by the small hydrometer silver meters sold in the shops. They are not quite accurate, but sufficiently near for all practical purposes. When the solution becomes discoloured from frequent use, shake it up with a little kaolin for a few minutes, and filter. Before using, again test for acidity, as some samples of kaolin contain carbonates, &c., which are apt to give the bath an alkaline or neutral reaction. If so, add nitric acid, as before, till acidity is clearly indicated.

The proper time for the albumenised surface of the paper to remain in contact with the solution in order to be effectually sensitised depends, in some measure, on the nature of the paper, but mainly on the quantity of chloride in the albumen. For Spencer's and Sanford's papers the following may be considered a good average time in summer weather:—Thick Saxe five minutes, thin Rive four minutes, thin Saxe three minutes. In cold weather rather longer time will be required. A prolonged contact with the silver bath has a tendency to damage the whites of the picture, to bronze the deep shadows, and to reduce the time during which the paper may be kept white and clear before printing.

The sensitised papers should not be dried by the fire, but hung up in the dark room to dry spontaneously—to facilitate which, the room in which the operation is conducted must be rather warm and free from moisture. Nothing conduces more to destroy their keeping properties than a moist atmosphere. For this reason, as soon as perfectly dry, and if not required for immediate use, they should be preserved in a cool place, between folds of very dry blotting paper, and pressed down to prevent contact with light and air. It is during this stage of the process that the quality of the paper and of the albumen can most readily be detected. If, after the lapse of a day, and sometimes even a few hours, the back of the sensitised sheet presents a reddish-brown appearance, the *paper* is in fault. If, on the other hand, the back preserves its whiteness whilst the albumenised surface is strongly tinged with yellow, the albumen has become stale, and the appearance we observe is due to the sulphuret of silver, formed by the nitrate coming in contact with sulphur, and the sulphuretted hydrogen generated by the partially decomposed albumen. A good sample should keep quite white and clear for at least two days in summer and twice that time in winter. It may, indeed, be taken as a rule, with few exceptions, that the better the quality of the albumenised paper the longer it will keep, and the more vigorous and brilliant the prints will be.

Preservative folios are sold which contain chloride of calcium, or some other substance having a great affinity for water. These will preserve sensitised papers for a much longer period than before indicated, sometimes for a month or more. But there is this danger attending their use: should the paper, immediately on its removal from the folio, be placed on the negative and submitted to the pressure-frame, it will very probably, after a few minutes' contact, pucker up in several places from unequal expansion, and utterly spoil the print. This arises from the fact that the paper, dessicated by the chloride of calcium in the folio, and therefore at its maximum of contraction, expands considerably in the ordinary hygrometric condition of the atmosphere, and has not room to do so regularly under pressure: hence the puckering. The danger is, however, easily obviated by removing the papers from the folio, and placing them loose in a drawer or dark cupboard an hour or so before they are used. They will thus absorb their natural amount of moisture from the atmosphere, and become quite fitted for their purpose.

Printing.—In order to obtain the best results, regard must be had to the nature of the negative. As a rule, the process should he conducted in the shade. The best prints from good negatives, whether on thin or thick paper, are always so obtained. But if the negative, although having the right exposure, be too dense and over-developed, some modification in the details will be necessary to improve the harmony and brilliancy, which would otherwise be deficient. For this purpose select a sensitive paper, such as the thin Saxe or Rive, which has been left for a longer time than ordinary on the sensitising solution, and print in a STRONG light. The direct rays of a summer sun will not be objectionable, provided the glass of the printing-frame and of the negative are quite clean and free from scratches; otherwise these defects will throw a shadow over some parts of the sensitised paper, causing thereby an irregularity of illumination, painfully apparent in the print when removed from the frame. To obviate this annoyance, the printing-frame should not be placed with its surface perpendicular to the rays of the sun, but in such a position that they may fall at an angle. By occasionally turning it round, and thus varying the angle, these shadows will fall on different points, and will hardly, if at all, be discernible. Over-exposed and somewhat fogged negatives are very fit subjects for this kind of treatment. They can thus be made to yield proofs which, on an insensitive paper and in a feeble light, are totally unobtainable. Care, however, must be taken to stop the printing at the proper stage—in this case a very narrow one—between feebleness and obliteration of the half-tones by over-printing.

Under any circumstances the colour of the print, when taken from the printing-frame, is a good criterion by which we can determine whether the sensitising solution is sufficiently acid. A generally pervading slaty blue denotes that it is not acid enough. A uniform redness in the half-tones and shadows shows either that the paper is bad or too much acid is present. The right colour is reddish sepia in the half-tones, and a darker sepia, with a slight tinge of blue, in the shadows. In the first case the prints, when toned, will lack vigour and contrast, and are apt to turn out mealy; in the second case there will be difficulty in altering the tone from what it is; whilst the last is that which produces with great certainty almost any tone we may wish to obtain.

It must not be forgotten that different kinds of paper sensitised on the same solution may, and generally do, show many varieties of tone on their removal from the printing-frame. Those which do not come up to the standard need not, on this account, be condemned. A little more or a little less acid may make all the difference. It is, therefore, important, when the proper proportion of acid and nitrate for a certain paper has been once found, to work with that paper alone, and especially to avoid sensitising and printing *at the same time* with *mixed varieties.*

(To be concluded in our next.)

* Continued from page 249.

REDUCTION OF WASTE SILVER.

By Charles Corey.

So much has been written from time to time on this subject in your pages, and the topic has been so freely and ably discussed, that it would, at first sight, appear that there could be little, if anything, to be added thereto.

But although many of the different methods proposed have been ingenious—some apparently simple, a few fallacious; though most of them were based upon sound theory, yet few, if any, have been sufficiently practical to be of real service to the unchemical, though painstaking, photographer. In the last number of your issue is an admirable, because correct, deduction of the changes arising from the double decomposition that would ensue by the addition of the salts of the sulphate of soda and nitrate of barytes. Every practised chemist must be struck with the ingenuity of the idea and the satisfactory result of the experiment. But it would be amusing to see the small amount of successful pictures to be obtained therefrom by the majority of practitioners, the whole of whom must have a large quantity of the *materiel* upon their hands, to say nothing of the difficulty of producing in a sufficiently pure state a

"fair crop of crystals," even to those who have some experience in the laboratory.

The very paper next ensuing, on *Fused Nitrate of Silver*, proves how subtle are the changes that take place in fusing pure nitrate of silver, and that even the initiated may be placed *hors de combat* by an ambushed enemy in his silver bath. As I think that the results of many years' practice in reducing waste silver in every variety of form, with a degree of success that has been the means of producing pictures of acknowledged good quality, whether in the form of negatives or the subsequent printing therefrom, may be of value to your readers, I will proceed to lay the facts before them.

Every practitioner in the art of photography will admit that the silver contained either in spoilt baths for printing proofs, or for sensitising plates, as proposed to be operated upon by the double decomposition of the salts of soda and barytes, forms a very small portion of waste; for there are few so inexperienced that they cannot correct the faults of either, so long as any considerable portion remains. The chief source is that arising from the needful copious washing of prints, anterior to their being toned. This has been stated by one who should be an authority, as recorded in your earlier pages, to form sixty per cent. of the amount of silver used. My own opinion is, that while this is overrated, the amount so washed out is very large—probably forty per cent. As it is better to wash the prints chiefly in hard water, so as to judge by the turbidity of the water how much more washing is needed, it is difficult to define what is the actual condition of the silver so washed away—much of it, doubtless, is nitrate, whilst the milky portion is chloride, upon which sulphate of soda would have no action. In fact, nearly all the precipitates, if of sufficient quantities to recover, take the form of chloride, upon which nothing but fire will act effectually, so as to thoroughly extricate the silver.

To the sink, then, that is attached to every dark room must be affixed an India-rubber tube, terminating in a large and deep jar. Into this every liquid suspected of containing any trace of silver (save and except hyposulphite and cyanide solutions, to be treated as will be afterwards described) must be thrown; so, also, slips of paper that have been cut off good prints, or the entire paper of spoiled ones, must be thrown after having been burnt. The jar, when filled, should have one handful of common salt stirred into it. This will throw down all the silver contained therein in the form of chloride; but, inasmuch as chloride is most readily produced, so also it is the most difficult to resolve into its elements. We must further operate upon it, even while in this state.

Were we to proceed to the agency of fire while in the condition of chloride alone, the chlorine is expelled so reluctantly, even by the force of the fiercest fire, that I have seen silver driven through the pores of the pot in minute globules, like quicksilver, rather than be induced to run down in its fused state to the bottom of the crucible.

A very simple expedient will entirely obviate this. Keep always in the jar a plate of sheet zinc. It has nearly as great an affinity for chlorine as the silver, and will absorb a very large portion of it. This is satisfactorily proved by the zinc being gradually eaten and corroded away; but as the chloride of zinc is soluble, whilst the chloride of silver is not, the former is washed away in the clear liquid at the top, leaving what silver was held by the hydrochloric acid in the very manageable form of oxide, yet not sufficiently pure to be acted upon by nitric acid, as it might be if wholly pure; but it is too much contaminated by remaining chlorine to be so treated.

As the precipitate readily falls to the bottom, the clear, supernatant liquid may be baled out again and again, until the jar has been filled and salt added five or six times over; then, after baling until the precipitate is becoming disturbed, the remaining liquid must be again set at rest in a smaller vessel, and most of the clear liquid further poured off. The semi-liquid mass is now to be thrown upon three or four paper filters, and when all is collected the so-filled papers are to be dried in an oven. The hyposulphite solution, as well as the cyanide, contains a far less proportion; but if these have poured into them a saturated solution of common sulphuret of potassium, called by old chemists "*hepar sulphuris*," the quantity deposited will more than repay the cost of the potash salt, and must be added to the previous precipitates.

Our pupil must now make friends with some obliging operative dentist, who will be sure to have a furnace just suited to the purpose; and also let him purchase two of what are known in the trade as "five-penny pots," and half a pound of good pearl ash.

The dried filters are now to be broken up in a mortar, and mixed with equal quantities of the pearl ash. One of the pots is to be filled with the mixture, and, when put into the clear fire of the furnace, to be banked round with coke, broken into bits about the size of an egg.

The heat of the furnace being raised, the mixture will gradually fuse and boil, and when it has sunk down in the pot a little more may be added, until the fused potash fills three parts of the pot, care being taken that it do not boil over. Should it threaten to do this, the heat must be lowered by opening the door of the furnace; if this do not check it enough the pot must be lifted a little from the fire. When it has remained fused sufficiently for all organic matter to be consumed—and this will be known by short puffs of gas ceasing to be emitted—the pot must be lifted by a pair of tongs adapted for the purpose, and having an iron shovel ready warmed upon the ground, the fused potash, &c., like liquid fire, must be poured into it, and the pot, whilst hot, must be recharged and heated as before. Whilst the second charge is progressing, the first will have become sufficiently cool to be broken up, and the bright metallic silver separated from it. A close inspection of the brown caustic potash will reveal many pure particles of silver still held in it: let it be put by for subsequent melting the same day, for it absorbs water so rapidly as to endanger the pot if left till the day following. The second charge must now be poured out into the shovel, again as before, but at no time of the operation should the fused potash be poured into water, as tried by myself at my first effort. The quantity of water was small, the liquid fire decomposed it, resolving it into its component gases, which when alone are not explosive, but combined are frightfully so. A discharge like that of a piece of heavy ordnance followed, dissipating every trace of the water, and with it very nearly destroying the eyesight of both myself and assistant.

When the whole of the mixture has passed through the fire, and as much of the silver collected as can be picked out of it, the fragments of the potash must be gathered up and put into the pot, which should not be suffered to get cool, and put into the fire again, and the heat once more raised, so that the mass be again thoroughly melted up. After so remaining some time, and the ebullition having gradually decreased, the pot is to be taken from the fire, and now left to grow cold. When cold enough that it can be touched, and the pot be broken up, a final button of silver will be found at the bottom, and if it have been kept fused long enough the potash will be found quite free from bright specks of silver, and may be thrown into the waste jar to aid future operations.

The silver having been collected and weighed, must be washed in dilute sulphuric acid, to clear away all remains of adhering potash; then washed again in rain water, and dried.

Should it be the intention of the operator to dissolve it again, instead of carrying it for sale to the refiner—who will depreciate it and give but little for it for fear of its impurity—an evaporating dish must be procured, and placed in a large iron ladle half filled with sand.

To each ounce of silver pour in two ounces of nitric acid and one ounce of distilled water: put the ladle over a moderate open fire, and the heat will speedily dissolve the silver, emitting very pernicious red fumes of nitrous oxide, the whole of which will pass up the chimney. When dissolved the liquid will gradually evaporate away; but if the heat be so great as to cause ebullition after the silver is dissolved, the ladle must be lifted off the fire and allowed to cool a little, and then be replaced, until the whole of the acid and water be entirely evaporated. When nearly dry the heat should be much raised, until the dried and crumbling mass will slowly fuse and melt. When all is fused, take the ladle and dish from the fire, and allow both to cool; then weigh the dish and its contents. If the dish has been previously tared, the contents will be found to be nearly one-half more than the metallic silver was. When its weight is ascertained it is easily dissolved in the requisite quantity of water, to make the solution of one drachm or half-a-drachm to the ounce, as the case may be. Should the cake of nitrate present a green appearance from the presence of copper, the melted condition must be kept up under greater heat, until the green is charred into a perfectly black. This is oxide of copper, insoluble in water, and may be separated from the solution by filtering. If the charring has not destroyed the whole of the copper, the solution must be evaporated again and the charring repeated; but as this also drives off a portion of the nitric acid, leaving an insoluble oxide of silver, it is better to put up with a faint trace of the copper, as it will be less prejudicial than the waste of the silver by expelling the copper too much.

A writer in these pages has asserted that a considerable trace of copper does no harm to printing. I have proved this to be cor-

rect. Objections have been raised to the presence of nitrite of silver in the bath for plates, engendered by over-pressure of the heat, thereby driving off certain atoms of nitric acid, even by so unquestionably learned an authority as Mr. Hardwich; but I quite concur, with Professor Emerson, that a bath that will not produce deep and effective pictures may be readily made to do so by converting its silver into the fused state, and redissolving it, *probatum est.*

The residue of gold, a great deal of which is left in the toning baths after prints are finished, may be recovered in a nearly similar manner. Into every portion of nearly exhausted toning baths pour the remains of iron developing solutions. The iron speedily precipitates almost all remains of gold, and if oxalic acid be added, so as to take up any iron that may remain in the form of insoluble oxide, and further precipitate what gold may yet be unacted upon, it can be washed, filtered, collected, and melted up with pearl-ash, in a similar manner as the silver was done; but it will require a long collection of waste-baths to repay the operation.

ON AN OBSERVATION OF MOSER'S IMAGES.*

By M. D. Van Monckhoven.

It is well known that photographic images are formed upon pure silver disseminated through a transparent film of pyroxyline, albumen, or other porous matter. The reader will recall also the celebrated observation of the sculptor Rauch, who, having left an engraving in contact with a glass, saw at the end of a certain time a reproduction of that engraving on the glass.

It is now some years since we have observed a similar fact. A glass plate upon which a picture has been taken, and afterwards cleaned off, presents the same image after cleaning when the breath is allowed to condense on it: it also as rapidly disappears when the condensed moisture has evaporated.

We have recently again observed the same phenomenon. The glass upon which the picture was taken was of a greenish colour, and contained a small quantity of lead, while the base was soda. It bore a portrait taken on collodion in 1857, and had been kept since that time in a very dry and dimly-lighted garret with more than fifty other glasses.

A few weeks since all these glasses were cleaned. By chance we discovered one which, under the influence of the breath, gave an image of very great intensity. Many would have called it a Daguerreotype portrait. This image viewed by reflected light appears as a negative. It exactly corresponds therefore to that of the collodion film. This was the only glass among the whole lot which illustrated this phenomenon.

According to instructions drawn from good sources, it would seem that this phenomenon occurs occasionally among professional photographers who keep their negatives. Regarding the subject from the same point of view as the theory of the Daguerreotype, it would seem to be desirable that their attention should be directed to this fact, especially in view of the curious experiments to which they have given rise.

The glass which we propose to describe was covered with iodised collodion, immersed in a bath of nitrate of silver to make it sensitive to light, and being placed in an ordinary apparatus was exposed to the sitter. The negative obtained was double, the new image and a second underneath very weak, recalling the invisible image impressed upon the glass.

The experiments were recommenced a few days afterwards, under the fear that we had to do with one of those phenomena of the storing up of light such as have been described by M. Niépce de Saint Victor, affording always two images—one newly obtained, and a second underneath very weak, but very perceptible notwithstanding.

We were much pre-occupied with the fact, when the idea occurred to us to work in the dark without exposing the glass in the camera. We could see only this time, after fixing, a very faintly perceptible image.

It is well-known that the polarised light resulting from reflection by metallic surfaces does not possess the same properties as that obtained from non-metallic reflecting surfaces. We availed ourselves of this property to make the image above described visible. It is sufficient in fact to examine the film by means of a Nicol's prism, at the proper polarising angle, and by turning the prism in such a way as to extinguish the light reflected by the glass. Greater success may be ensured by blacking the back of the glass. The silver constituting the image not participating in the properties of ordinary polarised light, the image, which would not have been visible to us had we not suspected its presence, became extremely visible, not only to ourselves, but also to those persons who at first saw nothing. This means of detecting silver may through its extreme sensibility become very useful to ascertain, for example, if light in ordinary photographic processes really decomposes iodide of silver, or whether it merely imparts to it new physical properties.

What, then, can be the mysterious cause of the production of an image upon the surface of the glass, and which afterwards gives the property of reducing the iodide of silver? It is certainly not an instance of the phenomenon of storing up of light; for, if it were so, all the glasses bearing a photographic image for a certain length of time, and exposed to the light, ought to give evidence of similar properties. If it be a molecular modification of the surface of the glass, in what conditions does it operate?—from whence comes its power of acting on the nitrate of silver?

It is only by collecting and discussing a great number of facts that we shall be able to eliminate a reasonable hypothesis on this series of phenomena.

* From *Cosmos.*

INCREASE OF SENSIBILITY BY WARM DEVELOPMENT.*

By M. Mc-A. Gaudin.

The process of the day is warm development, which seems to admit of the use of dry collodion in all the applications of photography. The subject is of the first importance, and merits our best attention.

The numerous drawbacks belonging to wet collodion are well-known to those who carry their nitrate of silver bath with them. If the nitrate of silver becomes completely dry on the plate, it dissolves the iodide of silver forming the sole photogenic film; but between complete solution and partial action there exist all imaginable degress of alteration, and from these all the various accidents which occur every time there is too much delay either in taking the impression or developing.

The management of plates is, in small establishments, an ever-recurring cause of spots, where a person is not kept specially for sensitising, as is the case where operations are conducted on a larger scale; but amateurs are obliged to perform the whole series of operations themselves, and therefore if they do not adopt all possible precautions, they will have at every instant black streaks, beginning at the edges and spreading themselves across the picture. The camera-backs which are not furnished with glass corners produce also streaks of the same character. The best means of counteracting the effect of the fingers is always to wash the hands with great care before beginning to sensitise a plate; but this occurs so often that it is either forgotten or done too hurriedly and imperfectly, so that the hyposulphite and the developer easily penetrates the skin. It would be much more simple to employ a holder for the separate operations of fixing and developing. Such is the method followed in developing by sulphate of iron, and might be adopted with equal advantage when using reducing agents having pyrogallic acid as a basis.

Since it is the nitrate of silver which produces all these accidents let us remove it, subject to its being replaced later in the process, and we shall radically remove the cause of the evil. Each reader will be ready to exclaim, "the plate will lose all its sensibility!" Such, however, is not the case, as my oft-repeated experiments will prove, and as the success of the dry collodion tannin process will abundantly corroborate.

I have said, latterly, after having long entertained a contrary opinion, that the presence of nitrate of silver in the collodion does not contribute in the least to its sensibility, and, in proof of this, I have shown that a stereoscopic plate completely sensitised, then washed one half in a vessel filled with water slightly acidulated with acetic acid, and immersed in the bath after receiving the impression, gave pictures of equal intensity on both halves of the plate. It is true that by operating in this way I do not entirely remove every trace of nitrate of silver; but the proportion is certainly reduced from $\frac{1}{10}$th to $\frac{1}{3000}$th, and it is this which prevents this small quantity, even when dry, from acting on the iodide of silver in such a way as to diminish its sensibility. The plate, then, can be dried without becoming decolorised, and furnishes a negative by prolonging the exposure; but the decrease of sensibility arises entirely from the impenetrability of the collodion.

This is proved also by the details of Major Russell's tannin process, in which before pouring on the tannin great care is taken to remove *all* the nitrate of silver, and when the collodion thus prepared is dry, it gives proofs free from spots, but with a great

* From *La Lumiere.*

diminution of sensibility. In this instance, again, I believe that the diminution of sensibility arises entirely from the drying of the collodion; for here is Dr. Draper who claims to have given to dry collodion prepared with tannin as much sensibility as is possessed by the collodion in the moist state and covered with nitrate of silver. According to his experience, also, we are led to conclude that the presence of nitrate of silver is in no way connected with sensibility, since by having recourse to certain substances, whereby the primitive molecular arrangement of the collodion is preserved or maintained, the sensibility which belongs to wet collodion is still retained. It remains to be ascertained if the use of honey and warm water acts in any other way than in preserving and re-establishing the penetrability of the collodion, in such a way as to render the iodide of silver accessible to all the re-actions. The following is an extract from Dr. Henry Draper's method:—

"This process consists essentially in keeping the plate warm during development, the developer being employed at a temperature equal to that of the room in which the operation is conducted. I have obtained a view of a street, with a lens of one and a half-inch opening, with an exposure less than a second, by keeping the plate at a temperature of 200° Fah. during development.

"In a communication made to the American Photographical Society at its last meeting in February, 1862, I have explained the whole details of this process. It may be briefly described in the following manner:—

"The plate is prepared in accordance with the instructions given by Major Russell; only the film is retained on the plate by the means usually adopted in America, that is to say, by painting the edges with a solution of albumen containing one part of the substance to six of water. After exposure the plate is immersed in warm water. The ordinary developer is poured, without being warmed, over the surface of the plate as soon as it comes from the water, and the operation is continued in the ordinary manner. If the plate becomes decidedly cold before the negative is sufficiently developed, warm water is again poured over it and the development continued.

"In an experiment made in the presence of two of the most distinguished members of our Society, Messrs. Hull and Cottenes, in my father's laboratory at the University, in using water heated only to 130 degrees Fah. we were able to reduce the time of exposure to a twentieth of the time required by a plate of the same size, prepared in the same manner, exposed with the same diaphragm, and developed in the ordinary manner with the water coming from a tap. The time of exposure in the camera depends on the heat of the water in which it is immersed before development. The shorter the exposure the warmer should be the water. I have used this process now for six months. I tried it at first on plates prepared by Dr. Hill Norris's process, for the reproduction of the image of the sun in my large reflector of sixteen inches diameter. A great many members of the Society were deeply convinced of the great advantages which this method offered for obtaining portraits, &c., and they added that, although they had many times employed warm developers, they had never seen *these* give a rapidity equal to that obtained by working upon a warm glass with a cold developer.

"If warm development alone produces an increase of sensibility it will be found to be a great advantage, since, if it be applied to wet collodion, an advance will be made towards the perfecting of our art."

The efficacy of Dr. Draper's method has often been contested in England: meanwhile the comparative experiments which are cited do not seem to leave any doubt on the subject.

To recapitulate. If the great increase of sensibility obtained by warm development be confirmed by experience, we shall, by attention to such details as varnishing the edges of the plate, and uniting all the recognised conditions for the best results, be finally in possession of a rapid dry collodion—all that is necessary being, as I have, I believe, already mentioned, the addition of a little resin to the collodion to increase its porosity and ensure the adherence of the film to the glass, also the addition of honey to the solution of tannin, and the soaking of the plate in warm water before development, according to the directions of Dr. Draper and Mr. England.

By these means photography on collodion will be relieved of many troublesome details; and supposing even that the dry plates do not keep longer than a few days, there is nevertheless great latitude for their preparation, and considerable certainty in the development, and these points alone will constitute a great acquisition for the practice of photography.

"NOTES," HARMONIOUS AND DISCORDANT, ON VARIOUS SUBJECTS.

By J. T. Taylor.

Exciting Rays and Continuating Rays.

This subject, intended to have been discussed in these "Notes" some time since, but overlooked until now, has been recall edto my mind by an observation which a member of the Edinburgh Photographic Society is alleged to have made at the last meeting. He stated that when working in a tent into which, from imperfection of construction, white light was admitted in such quantity as to damage the sensitive plate, he would destroy the action of this white light by increasing the size of his yellow window, so as to admit a large quantity of yellow light. This, it is to be presumed, would effect one of two things: first, that of charging, so to speak, the white light with yellow rays, so that the sum of both should be inadequate towards effecting a decomposition of the iodide of silver in the sensitive film; or, secondly, that of destroying by the *yellow light* the decomposition set up by the *white* light. The former hypothesis is untenable for a moment; the latter—that of the destruction of the effects of actinic by diactinic light—is deserving of some consideration. I am not aware whether this gentleman made this statement as a fact deduced from his own experience, or merely gave it as the *ipse dixit* of another. I have a perfect recollection of a contribution to the British Association meeting of 1847, by M. Claudet, in which, alluding to the Daguerreotype process, he stated that the action of white light on these plates would be destroyed by submitting them to the action of red or yellow light. But the conditions of the two surfaces—the metallic and the collodionised—are by no means alike. Nay, the changes instituted in two Daguerreotype plates—one merely iodised and the other bromo-iodised—is very different from each other.

It was possibly in consequence of M. Claudet's communication, that some opticians were induced to make their lenses with a slight over or under correction, on the supposition that the action would be quicker than when the foci of the yellow and blue were identical. Experience, however, has failed to bear out this supposition. But were the reasoning, or rather the assertion, of the Edinburgh gentleman correct, what a power would be placed in the photographer's hands! For example: an over-exposed plate could, by judicious timing under a yellow glass, be reduced to "exactly the proper thing;" and an accidental admission of sunlight into a box of some dozens of prepared plates by the prying of some inquisitive friend, would be rendered perfectly innocuous by such a simple means as a second exposure to the same agent (this time through a yellow medium) by which they were formerly destroyed, or, as anti-teetotallers the day after the "spree" would talk of curing their head-ache, by "swallowing a hair of the dog that bit them." In fact it would be better to keep plates, previous to exposure, in a box with a yellow glass lid. All these results follow legitimately from the premises laid down; but, unfortunately, it is a subject which has two sides.

I have hinted that the conditions of the Daguerreotype and collodionised plates are different, and that two Daguerreotype plates—one merely iodised and the other bromo-iodised—are very different from each other in the manner in which light acts on them. That they are so will be seen from the researches of M. Becquerel, who established the following theory:—That rays which cannot *produce* a sensible impression upon a prepared substance, out of the sphere of all radiation, may *continue* in a very energetic manner an action which different rays have begun to exercise upon it. The one he calls the "exciting," and the other the "continuating" rays: the more highly refrangible rays, the violet and blue, of course were the exciting, the others being the continuating rays.

To give an idea of the powers of the continuating glass, let me detail the following experiment, one of many made by Becquerel:—A sheet of paper was sensitised by successive washes of bromide of potassium and nitrate of silver. From this two pieces of similar size were cut, placed in succession under a negative, and were each subjected to an exposure of one second to a northern diffused light. One of these papers was then removed from the negative and placed under a sheet of orange-coloured glass, and so exposed to a diffused northern light for four hours. When examined after that time it was found that those parts on which the light had acted during its momentary exposure under the negative were entirely blackened, while the parts which had been protected from the original action of the white light remained as white as before. The other paper which had been kept in the dark was still in the same state. The inference from this is obvious. The momentary exposure to the light had induced a change in those parts on which the light fell, and the sheet of paper being removed and wholly exposed to the action of orange-coloured light, had those parts in which a change had been induced blackened in consequence of the property which coloured rays possess of carrying on the photogenic action; while, from the inability of these rays to affect a part not previously impressed, the whites of the picture were not affected in the least degree.

Lerebours says this experiment is conclusive: for, on the one hand, the image developed under the coloured glass in the absence of the object must have existed on the paper invisibly traced by the instantaneous action of the direct radiation; on the other hand, the part which had remained unchanged, notwithstanding

the action of the coloured glass, must therefore have been insensible to that action. It is therefore established that certain rays exist which are incapable of exercising primarily an action upon the paper, whilst these rays are very well calculated to continue that action when it has been begun by other rays.

To ascertain the action of yellow light on a sensitive collodionised plate, I yesterday exposed a dried stereoscopic plate in the camera a sufficient time to impress a picture. Having removed one from the camera I exposed one half to the action of yellow light under a suitably coloured glass, of course carefully shielding the other half from all light whatever. The experiment was repeated several times, and under glasses of various shades of yellow and red; but *in no single instance*, be the exposure what it might, could I perceive the slightest tendency to a destruction of the action of the original light. I next tried an experiment more directly akin to the admission of stray light into a tent. For this purpose I made in a tent a small aperture, so adjusted as to produce, by superposition, a feeble print on a wet collodion plate in one minute. I then repeated the experiment, with the addition of an admission of yellow light of a perfectly diactinic quality. This produced a picture differing in no respect from the former; nor did it produce any sensible effect when the quantity of yellow light was increased to such a degree as to flood the interior of the tent with yellow light. Nor is this to be wondered at, for no merely luminous agency is sufficient to arrest and neutralise decomposition once set up in a collodion film. Having satisfied myself that I had arrived at a legitimate conclusion, although diametrically opposite to that which on the authority of my brother member I *should* have found, I next tried the converse of the first experiment, by only a *partial* exposure of the plate in the camera, trusting to see the continuating glass make amends for under-exposure by bringing up all the details. Here, again, for the sake of comparison, I shielded half of the plate from the action of the yellow glass. The result has been decidedly unsatisfactory, a prolonged exposure to the coloured light producing an equal, and not an effect relative to the original force of the impression. The subject is very interesting, and I intend to return again to it. I would in the meantime advise any who have been so unfortunate as to get light on their sensitive plates not to endeavour to restore them by an exposure to yellow light, but to adopt the more certain and expeditious method of pouring over the surface of each a weak aqueous solution of iodine and iodide of potassium, without which, or some similar substance, the iodine will be very sparingly soluble. After washing, a solution of nitrate of silver applied, *secundem artem*, will restore the original sensitiveness.

In connexion with the action of light on a sensitive surface, Professor Draper has found that this action continues for a short time after the withdrawal of the light. If, for instance, an exposure of say nine seconds be necessary to impress a particular picture, then the result will be equally well attained by an exposure of six seconds, allowing the cover to remain on the lens for three seconds more after the first three seconds' exposure, the sum of the whole being equal to nine consecutive seconds.

The subject is curious, and ultimately may lead to useful results.

On Enlarging.

The subject of enlarging is one possessing more general interest than that of either exciting, continuating, or any other kind of rays. It is one on which many "notes," both "harmonious and discordant," have been sounded again and again, and of which it is at the present day scarcely possible to make too much. Since last I wrote on this subject I rejoice to find it has been on its trial at a meeting of the London Photographic Society—a trial the result of which will give considerable impetus to this branch of the art.

Until a few months ago I did not adequately appreciate the great importance of this branch of photographic manipulation. About that time, however, I was privileged to see and examine what had been done in this way by a gifted honorary member of the Edinburgh Photographic Society, Professor Piazzi Smyth, Astronomer Royal for Scotland. When travelling in Russia, some time ago, this gentleman took a series of views in that country, one of which was handed to me to look at. It was a stereoscopic picture possessing a somewhat flat appearance. In the distance was a town or city, but so reduced as not to be specially noticeable as a chief feature in the picture. Several pictures, panoramic and otherwise, were then passed through the lantern, projecting, by the aid of the lime-light, brilliant and well-defined images on the screen. My astonishment was excited when I was informed that these views had all been extracted from the flat and commonplace-looking view which I had just examined. Bit by bit they had been magnified and impressed upon plates, the result being that the walls, gates, churches, and public buildings of Moscow were passed before the eye with that beauty which an achromatic lantern and lime-light alone can give.

Negatives taken for this purpose must possess the extreme of sharpness and fine gradation, without possessing average density. With regard to the best kind of lens for this class of negative, there seems no doubt that the ordinary corrected meniscus produces results equal, if not superior, to the most expensive compound arrangement of portrait lenses. With a given aperture, one of the most unpretending of view lenses has produced a landscape of more general good definition than a compound quarter-plate lens which cost upwards of six guineas. The distortion of marginal curvature is here of no consequence, as it can be remedied in the enlarging. The great point is to secure intense sharpness. I have in my possession a stereo. negative, by Burns, which was taken with a meniscus lens, and which can bear inspection without deterioration with a magnifying glass of ·5 of an inch.

But to this subject I must again revert.

PHOTOGRAPHIC THEORY APPLIED TO RESEARCHES FOR ACCELERATIVE SUBSTANCES.

A photographic amateur, M. Eugene Sahler, in a communication to the *Revue Photographique*, says:—

Before making experiments on the employment of accelerative substances I have sought, in order to avoid groping in the dark, to determine *a priori* what it would be possible for such substances to be; and for this I have been obliged to go back to the formation of the photographic image, and endeavour to obtain a clear and precise explanation of the reactions produced under the influence of the luminous rays.

Chemical formulæ have conducted me to the following hypothesis, which clearly explains a crowd of facts of which it was difficult to take a record—a hypothesis confirmed up to the present by some experiments which will form the subject of a second communication when I have terminated the entire series of analytic tests which I propose to carry out.

The nitrate of silver which covers the sensitive plate undergoes first the reducing influence of light; the nitric acid which is liberated *in a nascent state* acts as an energetic oxidiser on the film of iodide of silver, and transforms it into an oxy-iodide (Ag I, Ag O) more or less charged with oxygen in proportion to the activity of the luminous rays.

The protoxide of silver at the instant of its formation is yellow like the iodide; the impression is therefore not visible after exposure. The different degrees of oxidation explain why certain parts appear before others, and with more intensity, when the plate is submitted to the developing agents: the office fulfilled by these agents is to absorb the oxygen. If an oxidation had taken place the iodised film could not be reduced by protosulphate of iron, gallic acid, &c., &c.

The result of experiments made by M. Millon tends to show that *pure* nitric acid does not displace iodine from an iodide; but that when mixed with a small quantity of nitrous acid, which adds considerable energy to its oxidating powder, the separation is effected immediately.

The nitrites are accordingly employed with good reason as accelerating agents, since there results from the decomposition of the film of liquid which covers the plate a mixture of nitric and nitrous acids which augments the oxidating force.

In order that the reaction should be complete, the silver baths should contain an excess of nitric acid, otherwise the reduced silver proceeding from the decomposition of the nitrate which covers the plate would attach itself to the film of collodion and fog the image. The free nitric acid prevents this deposit by effecting a new combination. This chemical action explains—

1. Why certain iodides produce greater sensitiveness than others. They may contain an excess of base, or, by double decomposition in the silver bath, may produce basic nitrates; in which case one part of the nascent nitric acid is neutralised, which obviates a retarding force in the production of the impression.

2. Why a negative passes into a positive proof by a prolonged exposure. During the time that the least active rays exert their developing action on the free nitrate of silver, the violet, indigo, and blue rays have finished their action; the iodine, completely eliminated, is found in contact with oxide of silver, a substance of but little stability, which displaces in its turn the oxygen, and produces afresh iodide of silver.

According to this hypothesis it is easy to determine what would be accelerating substances.

Reducing agents accelerate the decomposition of free nitrate of silver—they can therefore be employed; and phosphite of potash has already succeeded with me in the wet process.

Oxidisers ought to be employed for the dry processes. I have not yet made any trials; but I am of opinion that chlorate of potash may be useful, as also chlorites and hypochlorites.

ON THE DARK ROOM AND THE PHOTOGRAPHIC LABORATORY.*

By M. D. Van Monckhoven.

In the practice of photography three different rooms are necessary: one well lighted in which the sitter is placed, another of commodious dimensions which serves the purpose of a laboratory, and a third made quite dark, in which are performed all those operations which may not see the light of day. We shall speak of the first in a subsequent chapter: at present we propose to describe only the laboratory and the dark chamber.

The laboratory should be of such dimensions as are adapted to meet the wants of the photographer. Amateurs generally take plenty of room, because in most cases it costs them nothing; but professional photographers are oftener obliged to content themselves with a small room, which frequently serves the double purpose of dark room and laboratory.

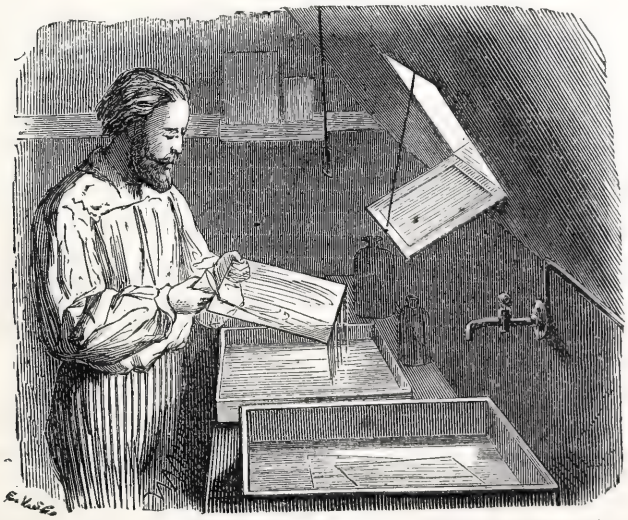
However this may be, it is best to have a large room on the ground floor, where preparations can be made, positive proofs printed, &c. In this room should be placed tables furnished with drawers.

As in the course of this work we shall mention as we proceed the various pieces of apparatus which are necessary, our readers will learn the various utensils which should find their place in the laboratory.

The dark chamber should be, on the contrary, very simple. Two or three tables are sufficient; and as to the light, it should be completely blocked out by pasting black paper over the windows in such a way that nothing can be seen in the room. The operations are conducted by the aid of a candle, or, better, by a gas jet surrounded by a square lantern of yellow glass. Notwithstanding that for many years the greater number of authors have recommended this arrangement, we have always preferred to have our dark room furnished with a frame of yellow glass $23\frac{5}{8}$ by $7\frac{7}{8}$, and this we cover with a sheet of very thin white paper, in order to impede the passage of the direct solar rays. A hinged frame is fitted in front of this square of yellow glass in such a way as to admit of its being totally or partially covered, in order to diminish or increase the amount of illumination at pleasure.

FIG. 29.

DARK CHAMBER.



It is necessary to select glass of a deep yellow colour and avoid the paler kinds.

The drawing *(fig. 29)* represents the dark chamber which we have used for many years.

The entrance is at the bottom of the room, and the door is for greater security covered with a black drapery. A cistern of water furnished with a tap supplies the necessary means for washing, and nderneath this is placed the sink, with a pipe to convey the waste water outside. On one side should be placed the dishes used for nitrate-of-silver bath and for sensitising albumenised paper, and on the other those which appertain to fixing and other operations incompatible with the nitrate of silver solution. Shelves should also be be fitted up to support funnels while filtering, bottles, &c.

A second reference to *fig.* 29 will show the arrangement by which the amount of light is regulated; it will be seen, in fact, that by lowering the yellow frame, which is shown in that position in the drawing, the room becomes inundated with light. This frame need be adapted only when the plate is immersed in the nitrate of silver bath, and during the development of the image. When the required intensity has been attained in the last operation, the plate is washed and the frame lowered in order to see more clearly. If the sun shines on this window, it is absolutely necessary to paste over it some thin paper to stop the too direct rays.

* From *Traité Populaire de Photographie.*

STEREOGRAPHS.

Australian Botanical Illustrations, &c.

Photographed by Frank Haes.

London: McLean, Melhuish, and Haes, 26, Haymarket.

The educational value of the stereoscope is perhaps one of its most striking features as presented to the mind of the philosopher, and the last one noticed by the ordinary observer. The former views it as a powerful engine with which he can both acquire and convey information, the latter regards it as a delightful toy; and, what is no less singular, they are both right in their respective estimates, only that each one perceives but half of the truth: indeed part of its value consists in the fact that it cannot amuse without instructing, nor instruct without affording amusement at the same time—not that it in any way resembles those nondescripts which are constructed to do double duty, performing each one imperfectly, but is rather to be likened to charity, which benefits both giver and receiver, and sheds a collateral blessing into the bargain.

We have run somewhat "off the track," as our American friends would phrase it, but it is a natural accident. We have frequently desired to know something about the aspect of Antarctic vegetation, and behold we have benefitted by what was certainly not intended for our gratification when originally executed.

Slides such as these before us must be of immense advantage to botanists. Stereographs, besides preserving the forms of vegetation in the most perfect manner, enjoy the additional excellence of presenting not only the *fac simile* of the living specimen of a plant, but convey at the same time an incontrovertible record of its surroundings—a point of no mean importance to a just estimate of its position in vegetable economy. But we must leave moralising, and write a few words about the several slides themselves, and firstly we notice

The Tree Fern (in the Botanical Garden at Sydney), the connecting link between the ferns and the palms. This is a beautiful specimen of photographic skill, taken under favourable circumstances, the foliage as feathery, albeit as crisp and sharp, as in nature, with a pleasing background of various trees and shrubs of the exogenous class.

The slide to which we particularly allude is that one in which a fine specimen of the tree fern is growing on the sloping bank of a narrow slip of water, with a younger plant just beyond, and the stem of a tree, akin to the willow in form, immediately behind it. There is another slide upon which a similar plant is depicted; but though good in execution it is not equal in composition to the one we have especially indicated.

The Bourbon Island Palm is a very pleasing specimen, with the gracefully-fringed fan-like leaves contrasting well with the small white-flowered herbaceous plant directly in front of it. The background of this is, to our fancy, somewhat marred by the stopping-out of the sky.

The Striped Aloe, apparently an Agave, is a magnificent sample of its species, picturesquely located, surrounded by numerous small flowering plants well known in this country, such as the fuschia, alyssum, petunia, &c., and backed by a glorious denizen of the forest in full leaf—the chequered light falling upon the broad fleshy leaves of the aloe giving increased value to the high lights of the same, which are brilliant without hardness, and mark the plant as most prominent of the group before us.

Most unfamiliar, yet attractive, is The Norfolk Island Shade Tree, consisting of a somewhat rounded mass of enormous, dark and shining crisp leaves, in form not unlike those of the beech tree, but upon a gigantic scale. This is a highly attractive slide.

The Liliacæ Dracenæ Nutans is the prominent object of another slide very picturesque in treatment. Besides the singular aspect of this principal feature in the group, the contrasting foliage of the neighbouring specimens is very happy, as is also the effect of light and shade in the whole.

The Madagascar Poison Nut Tree is too much under-exposed, and consequently too "hard" in effect, and the group of Gum Trees (Eucalypti) not well defined. The East Indian Wild Date Trees are also somewhat under-exposed.

For an example of the elegantly grotesque in the vegetable kingdom there are few things that can surpass the Filices Playcerium Grande, located at the fork of the main stem of a large forest tree. There are several other objects in this slide worthy of attention: the whole combines well, and the photography is excellent.

Appended to the preceding are two Views from the Sydney Observatory—one looking towards Botany Bay, embracing a long range of subject, but somewhat deficient in the distant parts, the other looking north-east.

We can recommend these slides as worthy of a place in the collections of those desiring to possess illustrations of the various parts of the habitable globe, as well as to those who make more special selections for the purpose of promoting the study of natural history, particularly as regards the botanical branch of the subject.

CARD PICTURES—AND HOW TO MAKE THEM.*

By S. R. Divine.

The great call for *cartes de visite* demands the best facilities for producing them, and numerous contrivances and adaptations in the way of instruments have been made with the view of rapidly multiplying small photographs. The double quarter tube camera being the one most generally used, I shall have something to say of my experience with it. I have a pair of quarter lenses with a box and holder to take four negatives on a four-fourth plate. My first attempts in using it were anything but satisfactory, and I had more than once made up my mind to abandon it altogether; but, being persistent in experimenting with it, I gradually became more successful in its use, till now I am entirely satisfied with it.

In selecting a double tube instrument care must be taken to get tubes that work in exactly the same time, otherwise the negatives will differ in intensity. Another difficulty sometimes occurs when the two tubes do not work to the same visual focus (in most of the new quarter lenses with long focus the chemical and visual foci are not perfectly concident); and I have known cases in which it became necessary to make the ground-glass of two pieces, one being placed nearer the lenses than the other in order to correct the difference between the foci. But, after the instrument is perfectly adjusted, it requires practice to get good results with it. Great care must be taken in flowing the plate, and the collodion should be as thin as is compatible with good intensity.

The most perfect part of the surface of a collodionised plate is about the middle, but the four negatives for card-pictures are on the corners. Again, the film on one end of the plate is thicker than on the other. I tried a difference of exposure between the thick and thin ends, but the results were so variable that I have adopted the plan of always placing the thin end downward and exposing it first, and afterwards exposing the thick end the same length of time.

The solution of silver on the plate flowing downwards allows the thick end to dry a little, and it is not so sensitive when its time of exposure arrives. By this management the difference in density is more nearly compensated than by any other method of exposure. Should there still be a difference, however, it can be very much modified in the development. The two pictures that appear first and with greatest density are to be less developed by tilting the plate and allowing the solution to run to the other end until all four pictures appear equally distinct.

By careful manipulation in this way quite a great difference may be compensated. But however careful the management, it is not always that the four negatives are equally good; and the operator who gets two or three first-rate negatives on a plate should be satisfied and use them in printing. A friend of mine, who is one of the best practical operators of my acquaintance, uses for card-pictures a single half-size tube, with a box and plate-holder for taking three negatives side by side in a direction lengthwise of the four-fourth plate. With this arrangement he informs me that there is no difficulty in securing negatives equal in density and every other good quality; but, of course, three exposures are necessary, and the method is not so rapid as when two or four tubes are used. I have made a great many card-pictures from single negatives, but the time required in printing makes it an unprofitable business.

Among a portion of the photographic profession there is an objection to quarter tubes for taking card-pictures, on account of their not covering a field sufficiently large. This objection has some weight against the old quarter lenses in use; but the new ones which are now made for *cartes de visite* are all, I think, that can be desired. I find that one of my tubes will cover a half-size plate with very good illumination and sharpness.

I will now make a few observations on the silvering, printing, and toning of albumen paper. I have made numberless experiments on albumen pictures, and will give what experience has taught me. The silvering solution must be very strong—from 100 to 130 grains to the ounce of water. The negative must be much more intense than for plain paper. In using a strong solution it is necessary to print considerably darker than when a solution of fifty or sixty grains is used. The toning must be done with chloride of gold made neutral or slightly alkaline.

A receipt which will prove a good one is to make a standard solution of chloride of gold one grain to the ounce of water; another standard solution of bicarbonate of soda three grains to the ounce; and, when toning, to add equal quantities of each to a convenient quantity of water blood warm. The gold should be added in such quantity that the prints will tone in from five to ten minutes.

The brilliancy will be lost if the toning bath is too slow in its action. Much of the success in albumen printing depends upon the quality of the paper used. I have been trying nearly every kind in the market, and there is such a difference in them that I have resolved to make my own paper hereafter. I shall be glad to communicate the results of my experiments.

*From *Humphrey's Journal.*

TEMPUS OMNIA REVELAT.

A truth palpable to photographers from the first, and repeatedly urged both in this Journal and in our contemporary, the *News*, seems at length to have reached the public mind. We quote the following remarks from an able article written by Blanchard Jerrold in *Lloyd's Weekly News*:—

"In the course of the discussion on exhibitions at the Society of Arts, Mr. Nelson suggested that the machinery of all nations, the silks of all nations, and the jewellery of all nations, should be grouped together; and Lord Granville 'admitted that, for the jurors, or for students, such a classification as Mr. Nelson had recommended would be a saving of trouble, but that was all.' All! Surely his lordship's admission justifies the proposed classification. Surely international exhibitions—if they have anything serious in them—should be adapted to the convenience of jurors and students! Yet Lord Granville remains wedded to the present classifications, which reduce the Exhibition to the level of a bazaar. It must have galled his lordship, then, and his fellow-commissioners, when Prince Napoleon said that 'he might, perhaps, express a desire that in future universal exhibitions the buildings constructed might allow the products to be grouped with greater method—not only by nations, but also by categories—in order to facilitate, by thus bringing them in contact, their comparison, and the progress that resulted from it.'

"Lord Granville holds that a building arranged as suggested by Prince Napoleon could not possess any architectural beauty or unity of design. He and his fellow commissioners have at any rate proved that the present classification will not always inspire either beauty or unity. On the other hand, the Sydenham Crystal Palace, with its distinct and separate Fine Arts courts, shows a broad and brilliant general effect. It would be as wise to compare Captain Fowke's building with Sir Joseph Paxton's Crystal Palace, as to set the Pantheon in Oxford-street beside the Louvre. The new classification would give a silk court, a furniture court, a pottery court—each designed for the purpose to which it was destined. Such an arrangement would tend to increase the interest and instructiveness of an exhibition; while it would afford splendid opportunities to the architect. Such courts would present to the visitor a series of charming contrasts.

"Our argument may be again illustrated by the Great Agricultural Show at Battersea-park. The cattle part is interesting mainly because the horses, for instance, are classed, without reference to their origin; thus, the racers are in company, and so are the hunters, the roadsters, and the cart-horses. The prizes are marked upon them, and the visitor is thus enabled to compare the reasons which have led the jurors to their decisions.

"The advantages of such a system are not to be buried and forgotten, because the royal commissioners decline to see them. We may inform these gentlemen that the Society of Arts discussion found its way into the French papers, so impressed were our neighbours with its importance; and they may have discovered by this time that it was a grave mistake not to enter, with liberal courtesy, into the most important question, which Prince Napoleon, in a few happy words, brought before them."

Exhibition Gossip.

THE DAMP!—THE PORTRAITS—GENRE SUBJECTS—PHOTOGRAPHIC CRITICISMS IN THE "DAILY TELEGRAPH."

"Oh! drat these room-attics!" says Mrs. Howard Paul's charwoman; and, like that poor old victim, our complaint must now be the evils which "come of damp attics," for here, in the sky-parlour of the Exhibition—as I have before said—damp is rampant. Blank spaces, whence coloured specimens have been removed, stare out at us, and at each visit the yellow livery of decay becomes more and more conspicuous in the photographs. This evil is a serious one, and attacks the public appreciation of the art in the weakest point.

The *Daily Telegraph* remarks on this appearance:—"It is not a pleasant indication of the quality of photographs, on the permanence of which we depend for reminiscenses in future years of scenes and faces which are present, and which are dear to us. Every practitioner should be able to assure his patrons that each portrait is sufficiently washed to stand exposure to *light* for any duration of time." Light is all very well, Mr. Critic; but how about *damp*, when it is so great as positively to reduce some of the cardboard backs of the mounts to a condition of pulp? It strikes me as being small detriment to photography to say that its productions will not escape tests to which neither water-colour drawings nor even engravings could be safely submitted; and there can be small hopes of so printing and toning, or, as the *Telegraph* says, "*washing*," that such tests as the alternate extremes of damp and heat* beget can be triumphantly withstood for several months together. As Shakespeare's grave-digger hints—damp is more sorely, surely, and powerfully destructive in its influence than many think it is; and we must remember that, if it had been allowed to pursue its ravages unchecked, the water-colour drawings in their far more cautiously, carefully, and thoughtfully prepared galleries down stairs would have had small reason to boast a permanence superior to that of these photographs, which, at any rate, displayed no signs of fading until some weeks after the damp had began to make most alarming progress among the paintings.

In answer to this defence it may be said that some of the pictures are more and some less affected, and many, *as yet*, not at all affected; and that those upon the screens have not escaped. But it is not the positive mechanical action of water only that is doing the damage:—noxious *spirits*, more potent than the combined damp and heat which beget them, are also at work; and these do not confine their ravages to the walls alone. Prints executed at the same time as the fading specimens, and under precisely similar circumstances, although exposed to light and air, are still brilliant in tones and pure in the whites, and doubtless will remain so. When we consider the tedious delays which characterised the management of Class XIV. in this country, and the little time at the worst part of the year in which our photographers had to prepare their specimens, it is small wonder if some prints were, as our critic of the *Telegraph* says, prepared without sufficient "care in fixing the image," and these would, of course, the more readily and quickly succumb to the destructive evils I have named. Again: many of our photographers still adhere to the old method of toning, and we may expect the pictures of these also to be in advance of their companions "on the road to ruin," while many specimens, perhaps—simply because they were better protected in the "fitting up" than others—may be the last to follow in their wake, or, weather permitting, will, we hope, escape altogether.† The mischief is not only done in some cases, but is also now *a-doing*, and my object in making these remarks is to remind you that the test, which our contemporary the *News* calls "a test upon a grand scale," is not a fair one, and is, therefore, one to which it is a very unfortunate thing that our photographs were ever *publicly* submitted. Already we hear the few visitors who find their way to the British photographers' share of the Exhibition garret, joking about "light come, light go," and misquoting the national bard in remarks concerning showing the eye to grieve the art; coming like shadows, so to depart.

Let us now turn again to the pictures, and conclude rapidly the notice of portraiture in the foreign departments. M. Allport has contributed from Tasmania some good portraits of the natives. Our volunteers may greet their brethren of Victoria in some large groups sent by Bachelder and Neil. Some very good card-portraits are contributed from Switzerland, by Vaugnat. Copenhagen has also sent some portraits, one picture being a very large group, by Emile Lange, after the style of Brothers, of Manchester. Adelaide contributes, among others, a portrait many will think worth seeking. It is an unusually large glass positive of John M'Dougall Stuart, whose adventures and discoveries have so interested us, and whose dauntless perseverance and courageous spirit of enterprise we have all admired. And here we really must quit the portraits altogether and turn to other branches of the art-science yet unnoticed. Before doing so, however, it may be as well to confess that many excellent works have escaped notice. Robinson's beautiful card-pictures, being few, and not occupying a very prominent position, were not included, as they should have been, with those I ventured to call the best in the British department. Hennah, of Brighton, well deserved a word of praise. M. Joubert exhibits some very good pictures. Mr. Eastham's large group—*Treaty of Commerce with France*—is among the best of its kind, and M. Bassano's no smaller group of military officers is decidedly amongst the worst. The first thing which catches the eye in this large picture is a huge mass of light pavement on which these warriors are placed, which, having a huge, staring, geometrical dark pattern, dwarfs the figures by contrast, and offends the taste by its ugliness. In the next place you observe that, for all the signs of roundness or texture exhibited, the row of coats might have been cut out of scarlet paper, and the row of boots out of black sticking-plaster. In the third place, you see the large amount of confusion and discord which keep the lights and shadows of the neatly-executed architectural background from agreeing among themselves as to where the primary light comes from, and where the cast shadows ought to go. M. Bassano should remember that the absence of light is also the absence of intense colour, and then he would not paint the shadows of scarlet coats the colour of crimson silk when seen in the light. Among the very best of the "*touched*" pictures, however, are those executed by this same M. Bassano. There are some other portraits which we must not pass unnoticed. These were photographed by M'Glashon, aided by the contributor, D. O. Hill, a name well known and respected among artists as that of the Secretary to the Royal Scottish Academy of Painting. Unsurpassed by any in the Exhibition for boldness, force, and rotundity, they are far from being faultless. The qualities which harmonise so well with a bold, masculine head standing out bodily from the surface, hardly contribute to the expression or feeling which should characterise a group of pretty girls affectionately making much of her they fondly call "Our dear old nurse;" and, great as is the relief obtained by vigorous, indeed somewhat harsh, contrasts of light and shade, I humbly venture to suggest that it should not be obtained by sacrificing those intermediate tints which secure delicacy and texture. The best picture, so far as regards the expression of sentiment, is also the worst photograph—it is called *The Story of the Bruce*, in which an imaginative boy glows with generous patriotic fire at the adventures of his country's hero; and his mother turns to look admiringly upon his boyish enthusiasm. A group of *Dr. John Brown and his Cousin*—which obtained the silver medal of the Photographic Society of Scotland last year, is the best photograph in this collection. D. O. Hill is a strong champion for the cause of "fine art in photography," and well deserves our heartiest thanks.

And so—with regard to the photographic portraits at the great World's Fair of 1862—*exeunt omnes*.

What shall we term the next branch of the art to which I would now fain direct your attention? Shall it be composition photography, a term by which the painter understands one thing and the photographer another; or shall it be designated *genre*, a term which is surely indefinite enough in itself, although we all understand the kind of subject which it indicates. Of these the reader will select that which best pleases him. I think the latter preferable, although it may not always prove strictly applicable to the subject before us. Here British photography stands pre-eminently foremost and alone; thus claiming for itself more aspiring and bolder flights than any of its foreign competitors. First in its ranks stands O. G. Rejlander, one of the most imaginative and skilful of all true artists. How it is that these pictures should be hung all but out of sight—unless it was so contrived lest such works should convey too convincing a proof of photography's claims as a fine art—I cannot guess; but there they are, placed high above their inferiors, with the glare of strong light so full upon them that to see them fairly, or see them at all unless you

* From the fact that on Tuesday the heat in the shady gallery indicated by the thermometer was 75·5, some idea may be gleaned of what it must have been in the photographic department.

† If exhibitors would communicate particulars in cases where their prints display signs of rapid decay, or in others in which they remain undamaged—especially if they continue so—stating process of toning, &c., and how fitted up, we might then judge *ipso facto*, and come to more definite conclusions.

are in special search of them, is quite out of the question. *Night in London* is the name of one of these pictures, which is full of the most eloquent pathos and expression. A poor vagrant, "Joe," houseless, hungry, and friendless, has crept with his dirt and rags into the inhospitable shelter of a dilapidated entrance-porch, and, crouched in an attitude suggestive of despairing wretchedness, snatches one of his fitful tastes of that cheap, but to him very nearly forbidden, luxury, sleep. The pose, the deep masses of shadow, and the feeble light, all help the story. There the poor desolate outcast sleeps upon the cold damp stone, forgetting even those dreaded persecutors, the churlish voice and heavy foot which will assuredly bid him "move on," whining and shivering, to some poor shelter equally unsafe and uninviting.

"Who whines in the bleak cold street?
Is it one of your silken spaniels
Shut out in the cold and the sleet?
My dogs sleep warm in their baskets,
Safe from the darkness and snow.
* * * * *
These are only homeless children
Who are wandering to and fro.
* * * * *
And so Lazarus lies at our doorsteps,
And Dives neglects him still."

In addition to this we have our old favourites, *The Wayfarer*, *The Scripture Reader*, and other well-known pictures. Some appear new, but to criticise them in their present position is simply impossible.

Mr. Robinson's pictures next claim notice. These are better hung. The *Lady of Shalott*, well criticised in a recent notice of the Exhibition of the South London Society, is a picture full of many beauties, although undoubtedly possessing many faults. The *Daily Telegraph* does not approve of it—says "the whole merit" of this picture "lies in the cleverness of a *pose plastique*," which must mean that, in the opinion of this sage scribe, its "whole merit" is nothing more than such merit as consists in lying placidly down in a boat prepared to receive you, and permitting an artist to arrange certain draperies and point a lens at you for so many seconds. The imagination which conceives such a subject, and the skill which carries out its conceptions, in selecting the scene, the hour, the general effect of *chiaroscuro*, the model, the pose, &c., &c., are all as nought in the eyes of our critic of the *Telegraph* compared with the wonderful effort required to prostrate yourself in a required position, and keep still while your portrait is taken. How hard it is to see through the spectacles of old and confirmed prejudices! And yet this writer has *some* conception of the difficulties of this branch of the art, as we shall see in the following quotation from remarks upon *The Holiday in the Woods*, of which it is said—"Almost as much trouble must have been expended on the building up of this scene, on the bringing together of all its constituent parts, on the drilling of its actors, on the subordination of its accessories, and on the careful eliminating of all petty 'accidents,'—which, although likely to pass unobserved in a *tableaux vivant*, are apt to grow painfully obtrusive in a permanent picture—almost as much trouble, we say, is apparent in the mere posing and scene setting,* and arrangement of properties, in this composition, as a practised draughtsman would have found in placing the whole group on paper and canvas. There is something absurd in all this preparation for a mechanical and instantaneous operation. It is anti-climax—a reversal of the order of things." So says the critic of the *Telegraph*. Let us take breath, and then look at the meaning of all this, if indeed it has any real tangible meaning to look at.

Question.—There is something absurd in the production of this picture by photography, you say, Mr. Critic: please to tell me why?

Answer.—Why! why because there is as much trouble in producing it by that means as there is by any other!

Question.—But supposing, when so done, it is such a picture as, while equalling others in most respects, infinitely surpasses them in the one great quality of *simple truthfulness;* and that, moreover, unlike the drawing, it can be reproduced by hundreds at a time when once done.

Answer.—"The simple truthfulness of these and kindred works is worth a hundred feats of artistic arrangement."†

But this critic is guilty of many other amusing contradictions, which, doubtless, brought a smile to the lips of all its photographic readers, but which it is no part of my present business to point out. I fear that photography, so far as regards the general public, will not escape a ban which has done more to retard the universal knowledge of art in this country than anything else, viz., the confident, unhesitating dogmatising of critics profoundly ignorant of the subjects on which they profess to write, but well able to write "smartly," as the saying goes—use technical phrases readily, and please indolent readers by taking the trouble to amuse them: sparkling but shallow.

R. A. S., in his remarks upon another of Mr. Robinson's productions, also exhibited here, pointed out certain very palpable errors in the choice of costume and accessories, which a contemporary hastened to pounce upon and hold up to ridicule, because one or two of the same errors were to be found in the descriptive portions of the poem from which the subject—*Elaine with the Shield of Launcelot*—had been selected. Two blacks, however, do not make a white, and R. A. S. had a perfect right to point out in the picture anachronisms which several of the reviewers did not fail to point out in the poem. I must certainly endorse my fellow-labourer's remarks so far as regards this work of Mr. Robinson's. The notice of these subjects must be resumed on the first of next month.

A. H. W.

* It seems as if our keen-sighted critic could not detect the difference between a photograph from natural scenery and one from painted profile set scenes. Truly a wise young judge!

† Quoted also from the same article from which the previous extracts were made.

ON THE VENTILATING AND WARMING OF PHOTOGRAPHIC GALLERIES.

By Lachlan McLachlan.

In your number of the 16th ult. I drew the attention of your readers to the defective arrangement of light as existing in the present construction of galleries. The evils shown therein are very far from being the only ones: we have others of various descriptions, amongst which that of bad ventilation is one which we have to complain of and to contend against. From my professional experience of these evils, I know what the majority of them are in respect to *comfort*. Let it be distinctly understood that I do not allude to elegant furniture and costly fittings. I know many establishments where the arrangements appear comfortable, and may be considered perfect. Such *comfort*, so far as it goes, is all very well, provided no improvement be neglected that would tend in a much greater degree to the *real comfort* of the visitors.

I will attempt to describe, as far as my ability will allow me, what kind of places I have found photographic portrait galleries to be; and, if my description be true, I believe that nineteen persons out of every twenty will support me in the statement which I here make. I unhesitatingly assert that we have not expended our money to the best advantage, but neglected to do that which is of the most vital importance; in fact, we have sacrificed improvement on the altar of attraction.

A photographic gallery is a place where no person would wish to remain longer than absolutely necessary. On your entrance, during winter (under natural circumstances), your reception is too cool to be pleasant, and in summer much too hot to be agreeable. When the sun shines on the glass it heats the air in the gallery so much as to become absolutely oppressive, and to be totally unfit for respiration for the shut-up professional. Well may visitors complain of the inconvenience they suffer from the contaminated air of close, ill-ventilated galleries, solely arising from air respired and perspired in for hours together. How can we possibly expect to obtain a correct and pleasing likeness when the sitter is nearly overpowered with vitiated air? After repeated trials we succeed in obtaining a likeness, but, mark you! at what a cost to ourselves! I will say nothing of the discomfort patiently submitted to by the sitter.

It is a very easy matter to obtain a map of the face with a lens, but a most difficult thing to get a true and characteristic portrait. Nothing less should satisfy a thorough professional. To give an artist a fair chance, all disturbing influences ought to be removed; for, if the sitter feels uncomfortable, the likeness must inevitably reveal it. This should tell us that, instead of surrounding the sitter with every imaginable discomfort, we ought to tax our ingenuity to the utmost to make our galleries the most comfortable rooms that science can enable us to do; and when we succeed in doing so, I am quite certain the outlay will bear fruit in more ways than we can possibly contemplate. In the first place it will be conducive to our own health, and of considerable pecuniary benefit also; moreover, the inducements will be much greater to those persons who now raise objections to sit, in consequence of our present defective arrangements. In proof of this, I may instance the temporary falling off of business during sultry days.

I wish now to draw your attention to the sad and defective system of ventilating the great majority of our establishments. Probably no subject connected with our profession has received so little attention as this. Assuredly it ought to be a primary object, in the construction of our galleries, to ensure a constant supply of air, as conducive to our own health and vigour.

These things are allowed to continue simply because they *are so;* but shall we continue such gross imperfections, or make them matters of the past? There should be proper provision made for the admission of fresh air, as well as for the escape of that which is vitiated. Sometimes this can be accomplished very simply; at other times it is most difficult, as no two buildings can with any certainty be ventilated alike. Under the most

favourable circumstances spontaneous ventilation can never be depended upon; for, when the exterior atmosphere is in a state of repose, the currents necessary for effective ventilation cannot be maintained; and even when there is sufficient external air the course of the wind, and even currents in the room, will often prevent the escape of the contaminated air, and the cold air from without will as often pass in as the impure air pass out. But happily we can command really effective ventilation by mechanical means, and at very little cost.

1. There must be openings made to admit, in sufficient quantity, currents of the purest air obtainable, which should be from the shady side of the building when possible. An even supply could be maintained by cutting a piece of glass out of the bottom of each pane and inserting wire gauze in its place. The openings could be regulated at pleasure, or entirely cut off by sliding panels. There must also be ample provision made for the escape of the vitiated air. Two openings 12 inches square in the most favourable place of the ceiling would be sufficient for a room 24 feet by 12 feet, and 12 feet in height. Under each opening there should be a cap, projecting about 4 inches all round, which should be made moveable to and from the ceiling at pleasure. These will more effectually enable us to extract the impure air. We should also be able to contract the openings, if desirable, at any time. By creating heat in the ventilator we can ensure perfect ventilation. Where there is gas that can easily be managed, by placing a burner in each opening, which can be regulated to the particular circumstances of each case. The cost would be a mere trifle, and not at all to be compared with the benefits conferred.

Photographers would be greatly benefitted by an even atmosphere maintained throughout the year. This can be accomplished by a system of hot water pipes, that would regulate our rooms in winter to an equal temperature, and would, I have no doubt, prevent a large per centage of our failures—in fact, it is in the end the cheapest method of obtaining heat, as the attendance on fires is saved and dust prevented. By this means we could obtain warm water in our dark rooms or in any other part of the building, which would be a most valuable acquisition.

I have ventured to trespass thus much on your space in the hope of drawing increased attention to the subject of ventilation, to which, it seems to me, a large share of our successes and failures can be attributed; and, if this communication will awake in any of your numerous readers a desire to inquire into and improve their respective arrangements, I shall be much gratified, and shall believe that I have not written altogether in vain.

THE HOT WATER PROCESS.*

By J. Beldon.

The process which I shall describe to-night, and illustrate with specimens, is that known as the "Hot Water Process."

This process, like many others, is claimed by two inventors—the first Dr. Ryley, and the second Mr. Parry.

Dr. Ryley, to substantiate his claim, wrote the following interesting letter to the *Photographic News*, of 2nd November, 1860:—

The Hot Water Process.—Sir,—Permit me a space in your columns, in order to draw your attention to a paper recently read by Mr. Parry before the Manchester Photographic Society; and in doing so, it will be necessary to bring before your notice a series of experiments commenced between two and three years ago.

While making some experiments with albumen as a preservative, I found that if all free nitrate was washed from the collodion film, it so far retarded the action of the plate that I could scarcely get a picture with half-an-hour's exposure. The thought then struck me that this was due to the altered structure of the film, and not to chemical action; and that if the plate was redipped in the nitrate bath to coagulate the albumen, I should restore its sensitiveness: this I did, and found great sensitiveness and uniformity of action the result.—(See *Liverpool and Manchester Photographic Journal*,† July 15, 1858.

Still carrying out my experiments I thought, if correct in my theory, I should succeed by making use of collodion iodised with iodide of cadmium, as the free nitrate of that metal left in the film would be sufficient to coagulate the albumen without any further process, and so great was the sensitiveness that I took a portrait of my son in a few seconds; but there is this drawback, that the film blisters all over when the metallic iodides are used.

Still believing my theory correct, although strongly opposed by the Chairman of the North London Society, who maintained that a chemical, not a structural, change was the cause of sensitiveness, another thought crossed my mind, that the most simple means of coagulating the albumen would be the best. Therefore, after taking my plate from the bath, and washing it from all trace of free nitrate, and then coating it with albumen, I plunged it in a bath of water just below the boiling point for a few seconds; and when dry I got a negative in less than thirty seconds with a Ross's telescopic view lens.—(See *Photographic News*, October 29, 1858.)

Now, sir, you will not wonder at my surprise in finding my process, announced in 1858, described by Mr. Parry as something new in 1860.

In conclusion, I may remark, that I shall endeavour shortly to lay before your readers details of some recent interesting experiments as to the best mode of producing the required structural changes. Jno. Ryley, M.D.

Islington, October 30th, 1860.

I should have been glad of showing you the manipulation; but hot water at this time of the year, and in the present room, would not be tolerated, and might bring the society into *hot water*. For this reason, I will describe the process as minutely as is consistent with brevity, so that any one with proper care cannot fail to get beautiful negatives.

In the first place an ordinary positive bath will be the most useful and constant. I may remark here that, last autumn, the bath I was then using contained only 20 grains of silver to the ounce of water, and with it I got some as good negatives as I have done with a bath at 40 grains.

I coat the plate with any good negative collodion, and let it set well, then immerse in the bath, and leave it there for a few minutes, say two minutes.

When the plate is free from streakiness, take it out of the bath and wash it well all over with common or distilled water.

The plate is now ready to receive the albumen solution, which is made as follows:—White of 2 eggs, water 3 ounces, and ammonia 20 drops, well beat up, and then filtered through sponge.

Take five drachms of this solution and pour it on the edge of the plate, and let it flow in one wave to the opposite edge, and then backwards and forwards until it shows a perfectly even film on the plate; drain the plate for about a minute, during which time you can get your hot water ready, and pour it into a pint jug.

You now take the plate and put it on a stand, and pour over it the hot water. The reason I recommend pouring the hot water over the plate is this: when you use a glass, bath, or dish, it is liable to break, causing a loss of the plate and a loss to the pocket of about six or seven shillings. I have had one broken; and, as I do not wish to run the risk of a bath breaking every time I prepare a number of plates, I have adopted the above method of washing on a stand, and I find it to answer equally as well.

When the plate has drained from the hot water you can let it dry of itself, or finish with a little heat. I prefer the latter method. You will know when the plates are dry by looking through them to see if they are all of one colour: should there be patches of a rather creamy appearance, let them dry a little longer. The plates are now ready for exposure.

The exposure, with a Lerebours' lens, fourteen inches focus, one-half inch stop, varies from four minutes to twenty, or more, according to subject. The plate being exposed, I put it into a dish of clean water so as to moisten the film and then develop with the following:—12 grains pyrogallic acid, 1 drachm glacial acetic acid, and 7 ounces water.

I take five or six drachms of this developer and add to it a few drops of plain nitrate of silver solution, then pour it on the plate, and keep it moving until the picture is perfectly out and of the proper density. Should the developer become muddy, wash the plate and apply a fresh solution.

The development of a good negative requires about ten or fifteen minutes. Wash the plate and fix with hyposulphite of soda one ounce, water six ounces; then wash the plate under a tap for five minutes. When the plate is dry varnish it with any good varnish.

The negative is now finished, and if when held up to the light it show so dense that you cannot see through the high lights, you may conclude that it is not sufficiently exposed, or it is over-developed. A negative of this class gives very hard positives, and can never yield the soft vigour, if I may use the expression, which distinguishes Mudd's pictures above all others. Mr. Mudd has said that a good negative is dense in no part, and I can fully endorse that statement. A negative which is not so dense gives a very harmonious print, and the eye is not struck with patches of black and white mingled in the picture. I lay more stress on this part of my subject than perhaps is really necessary, but my reason for so doing is to put you on your guard, so that you may avoid soot and whitewash prints, which have now, deservedly, gone out of date.

I am confident that this process, worked carefully, will give you plates, both for keeping qualities and results, equal to the best process known. The failures and remedies are the same in this process as in any other dry process where albumen is used.

I hope before the next meeting that many of you will have been in "hot water," and, should you be satisfied with the results, I shall congratulate myself upon having enlisted a few into the regiment of hot-water workers.

[The paper was illustrated with some very good pictures. We may add that Dr. Ryley's process was first published in our columns.

WHERE TO GO WITH THE CAMERA.*

By Our Own Pioneer.

ROUND LAUNCESTON.

At the present time, Lanson, Launceston, or Dunheved—the town of the swelling hill—possesses considerable interest from the fact of the Duke of Northumberland's property, the fine old park at Werrington, with the mansion, having been purchased for H.R.H. the Prince of Wales, as a shooting-box; and there is a rumour that the Northumberland property in the borough has been purchased also—a good omen for the future of the neighbourhood. With this, and the line of railway about to be carried out, the old town may revive and again look up. To reach Launceston there is the omnibus from Exeter, the coach from Bideford, and various conveyances from Tavistock and Plymouth; and a choice of inns and boarding-houses to stop at when there. Should the artist prefer picking up something by the way, he can halt at Oakhampton, if coming from Exeter, and will find the following worth his notice:—Oakhampton from the bridge, taking in the old chapel and bell turret; ruins of the castle, and others of more or less interest. Seven miles further is Bridestowe, with the remains of a fine Norman gateway leading up to the church. To the east is Sourton Down, with the church coming in as the principal object. Some cottages, and a dark moor backing the quarries, about here, are good busy subjects, full of interest. One between Lew Down and Bridestowe—from the great extent of excavation and its numerous sections, engine-house and offices, with all those adjuncts of broad and narrow plank-ways, stops, supports, and fine contrasts of light, shade, and colour, from the deep and uneven breaking up of the rock—will offer several peculiar and excellent pictures. The place is close to

* Continued from page 257.

* Read at a meeting of the Bradford Photographic Society, July 2, 1862.

† The title by which The British Journal of Photography was then designated.

the roadside, with ample choice of situation for placing a camera or fixing a tent.

At Lew Down there are two good inns, and many good subjects around: the church of Lew Trenchard, the old house at Sydenham, with its church and monuments erected to the memory of the Tremaine family.

Some two miles on the Lifton road is an old gateway, leading through a well-wooded avenue to a place named Hayne, in a small but finely-wooded park: it was here the unfortunate King Charles rested and secreted himself on the failure of his cause in Cornwall. The interior has much old carving, in good preservation, and one room is said to be in nearly the same state as when the fugitive monarch used it. At Lifton there are many good subjects. The church and town seen through the arch that forms the tramway of the lime quarry—a view with extensive distance to the north-west, from the high ground leading down to Poulston Bridge—is a varied combination of wood and water, with Launceston Castle looming high up in the distance: it is in this said looming that the old castle and its formidable keep of terrible strength comes out in a way that defies rivalry.

Over Poulston Bridge you are out of Devon and into Cornwall. The town of Launceston fully bears out to the artist and photographer that the "good is not new, and the new not good." Here all the good is old and time-worn; the new, stiff, formal, and matter-of-fact. The Church of St. Mary's, in the centre of the town, is a remarkably fine building, highly decorated, with an elegant Gothic tower, and fine porch with well sculptured ornaments. On the stone carving running round this church are a quantity of shields, containing about 152 letters, one letter to each shield. It is in praise of St. Mary; and, when read on from the commencement, gives, as each letter follows the other, "Ave Maria gratiæ plena Dominus tecum sponsas," &c., &c., till the laudation is complete. In various views this church comes in as a most telling object. The castle, or rather the magnificent ruins, are finely adapted for either the pencil or camera. At various distances it assumes very peculiar shapes; and the keep, situate on an immense mound, looks like a cylinder springing out from a large globe—the high ground on which it is placed giving a double elevation to this noble wreck of perished greatness and bygone times. The close views may be comprised in the Gateway, the Witches' Tower at the south-east angle, and the ruined walls of and around the keep. From the archway and entrance to the town from the east there is a fine view of the castle: the keep as a middle distance—St. Mary's, with its elegantly traced tower, on the right—St. Stephen's by Launceston, as it is termed, conspicuous in the extreme distance, backed by the extensive chain of downs near Egles-Kerry, that extend across the country from Launceston to the Bristol Channel—in the centre of the foreground the old arched gateway, with its deep mullioned window laced around with ivy, dark slate roof, and vane, high old-fashioned chimneys rising here and there in satisfactory situations—the projecting sign-board of the low roofed inn—remains of the old town wall, with its broad coping of rough masonry—with the bold overhanging foliage of some fine trees right and left—fill up and complete a very interesting picture. Another good point is from Newport Bridge, coming in from St. Stephen's. Here the keep rises most majestically over and above the surrounding houses—St. Mary's Church, now on the left, with castle and keep standing out against the sky, clear, well defined, and uninterrupted—the foreground composed of low thatched houses, some fine poplar trees, and the old three-storey building at the entrance to the tan-yard—the rough masonry of the parapet of Newport Bridge coming in right and left. Let the artist now turn his back to the castle, and, instead of going up the hill to St. Stephen's, turn sharp round to the right, following the narrow road for about 200 yards, when he will come to a high bank on the right of a lane, and from this there is a most extensive and busy view of old Dunheved, differing entirely in aspect from the two previous ones, the steepness of the town being clearly indicated by the houses rising line above line, and again bringing out in towering bold relief the ruined ivy-bound remains of a thousand years. The Church of St. Thomas—old and time-worn—with many cottages and ancient houses, the tower, and some old gables reflected in the stream, will form a good subject. On the crest of the hill is St. Stephen's, a building of the sixteenth century, with a Gothic tower of noble and elegant proportions, in a situation that will afford near or distant views. Opposite the church is an open space where the fair is held, from which spot many good views may be secured; and directly in front is an inn, from the upper windows of which some good instantaneous pictures might be taken, as a room could be secured for preparing the plates. A short distance farther on, to the right of the main road, a broad gate, with more pretence to strength than elegance, leads into Werrington Park, a place that dates from the time of William the Conquerer. For studies of trees, detached or in groups, there are few places in England to be named with it. On the right of the lodge as you enter, a road winds up an immense embankment or wooded terrace, ending in a sort of nondescript erection termed a triumphal arch. The architectural pretensions of Werrington House are contemptible, but the woods, glades, leafy screens, noble avenues, and all that combines the beautiful in nature with the secluded, is to be met with here in perfection and profusion—the river winding like a snake of silver through the centre of the park, and thereby placing one part of the estate in Devon, the other in Cornwall. From the terrace several fine pictures can be taken, including the house on the Devon side, the church to the left on the summit of some rising ground, overlooking the two conspicuous mounds called "Wilsworthy Barrows," with North Tamerton on the right, while below on the plateau of the park stands the house—mean and insignificant in itself—but the fine dark masses of foliage, relieved by the intermingled meadows and grassy slopes, the stone bridge and river, gigantic trees of some centuries growth, will furnish pictures with reflected tones, ærial distances, and compound masses of landscape beauty rarely to be met with. From the high terrace mentioned the operator can place the camera at pleasure and select a variety of points, a convenience and opportunity that no other place can offer. The lower part of the park is equally rich in scenes of sylvan interest, either from the bridge, the drive to the mansion, or pathway to the church. From this path, sheltered by immense clumps of trees, interesting groups of deer may be taken. We lately saw some fine specimens taken from an avenue of bending boughs, a leafy thicket fringing the slope down to the winding river's edge, while on the sun-lit mound of grass and flowers many of the herd were quietly feeding. The church is on the top of the hill: it originally stood close to the mansion, but was removed, piecemeal, from there some eighty or ninety years back, and re-erected in its present position. In the jumble of reconstruction and rebuilding it has, externally and internally, established a sort of architectural order entirely its own. The interior is like a large whitewashed and plastered room, with a flat ceiling to match. In each side wall, north and south, is a recess, to be reached and entered only from the exterior: these are the pews for Werrington House. The pulpit is the only accessory that gives any idea of a church. There is some fruit and flowers carved in wood over the altar most exquisitely rendered—worthy of, and probably by, Gibbons. The font is also finely cut in marble: it was a gift of the Percy family. The exterior has something of the appearance of one of the toys built by children from blocks and pieces taken out of a box and termed "architectural models;" while in a niche of the tower, as if to prove the truth of the saying, "nothing new under the sun," there is a "*steel shirt*" of one of the Dukes of Cornwall. The church, both inside and out, will make pictures, if not artistically good, decidedly curious. In removing this building from its position close to Werrington House, the graves and homes of the dead could not be removed, consequently the greater part of the lawn of the above-named mansion is on the mouldering bones and dust of hundreds of a bygone age. At the present day the removal would not have been allowed. A short distance from where it now stands is a place called "Ladies' Cross," said to be the spot rendered famous as the scene of meeting between King Edgar and the beautiful Elphreda, the daughter of Orgarius, a renowned Cornish duke.

Yelm Bridge and Yelm Quarries—the moss-covered boulders and woody ravine on one side of the bridge, with the quaint, gabled houses and fine trees on the other, broken rocky foreground and dash of the stream as it darts from one huge mass of granite to another—will give several varied and interesting subjects. A week or more may be spent round Launceston and the neighbourhood by amateur or professional photographers, and a great number of first-rate subjects secured.

PHOTOGRAPHY FOR TRAVELLERS AND TOURISTS.*

By Professor Pole, F.R.S.

It is the natural wish of most persons who visit a new locality to bring back pictorial representations of the scenery; and this want is usually met in one of two ways—either by published views or by sketching. In well-frequented places, published views are generally to be had, and command a large sale; and the accuracy of these publications has of late been much increased, and their circulation much promoted, by the more general introduction of landscape photography, and the great increase of professional practitioners.

But the facility of obtaining views in this way is not without its drawbacks. In the case of engravings, both the accuracy and the artistic merit may be anything but satisfactory; ordinary photographs, though they must be tolerably true, may not represent the particular objects, or show them in the particular way the purchaser may desire; and it need hardly be said that there are vast numbers of localities visited by both travellers and tourists, particularly the former, where neither engravings nor photographs are to be found, and of which it is, for that very reason, most peculiarly desirable to get accurate views. To meet these difficulties, the only resource has usually been hand-sketching. Now, the power to sketch well is undeniably one of the greatest advantages a traveller can possess; but, unfortunately, though drawing is now one of our stock school accomplishments, only a small minority of those who travel are able to transfer efficiently to paper what they see; and even in favourable cases, though clever and artistic pictures may be produced, the faithfulness of the representations must always be more or less uncertain.

Doubtless, the idea must often have occurred to almost every traveller, what an advantage it would be if he could himself take photographs, where he likes, of what he likes, when he likes, and how he likes. But such an idea must soon have been dismissed, from the supposed incompatibility of this with ordinary travelling arrangements. The usual notion of photographic operations comprehends a fearful array of dark rooms, huge instruments, chemical paraphernalia, water, and mess, which no sane person, out of the professional photographic guild, would think of burdening himself with on an ordinary journey, and which only a practised adept could use if he had them; and so the idea of a

* From *Macmillan's Magazine.*

traveller's taking views for himself on his tour is generally dismissed at once as an impracticable chimera.

Now, it is the object of this article to show that such a view of the matter is a delusion, and that any traveller or tourist, gentleman or lady, may, by about a quarter-of-an-hour's learning, and with an amount of apparatus that would go into the gentleman's coat pocket, or the lady's reticule, put himself or herself into the desirable position we have named.

It is not our intention to write a treatise on photography; but we must state generally what the operations are, in order to make our explanations intelligible.

The process, then, of taking a photographic picture consists essentially of three main divisions, namely—1. Preparing the plate; 2. Taking the picture; and 3. Developing the image; and the most common and best known arrangements of these is as follows:—A glass plate of the proper size is coated with collodion, and made sensitive to light by dipping in a bath of a certain solution. It is then, *while it remains moist*, placed in a camera obscura, and exposed to the image formed by the lens; after which, *but still before the plate has had time to dry*, it is taken out, and treated with certain chemicals which have the property of developing the image so obtained. The plate is then what is called a "negative;" from which, after it has been secured by varnish, any number of impressions, or "prints," may be taken at any time.

Now, it will be seen, by the words we have printed in italics, that, according to this method of operation, the whole of the three parts of the process must be performed within a very short space of time; and, since the first and third require to be done in a place to which daylight cannot enter, a dark room, supplied with a somewhat extensive assortment of chemical apparatus, must be provided *close to the place* where the picture is taken. This method, from the necessity of the plate remaining moist, is called the *wet* process. It is always employed for portraits, and has the advantage not only of great beauty of finish, but of extreme sensitiveness, requiring only a few seconds' exposure in the camera.

The wet process was the first, and, we believe, for some time, the only collodion process in use. But, in a happy moment, it occurred to somebody to inquire whether it was really indispensable that the plates should be kept *moist* during the whole operation; and it was found that, by certain modifications of the process of preparing them, they might be allowed to *dry*, and that some time might elapse between the preparation and the exposure, as well as between this and the development. The immense advantage this promised to landscape photography led to extensive investigation; and several processes have now been perfected which will secure this result. Plates may be prepared at any convenient time and place, and may be carried about for months, ready for use at a moment's notice; and, after the picture is taken, they may also be kept some time before development. The only price we pay for this advantage is the necessity for a little longer exposure in the camera; which, for landscapes, is of no moment at all.

The bearing of this discovery on our more immediate subject will be at once apparent, as it gets rid of the necessity of providing, on the journey, for the preparation and development, with all their cumbersome and troublesome apparatus, and limits what is necessary to the simple exposure, or taking of the picture. And another advantage of still more importance follows from this—namely, that the plates may be prepared and developed, not only in another place, but by another person. The knowledge, care, and skill required for photography, as well as the stains and all other disagreeables attending it, refer almost exclusively to the preparation and development; the exposure to take the view is an operation of the simplest kind, which anybody may learn in a few minutes, and which is attended with no trouble or inconvenience whatever.

Limiting, therefore, the traveller's operation to the taking of the picture, let us consider what this involves. The first question which affects materially the portability of the necessary apparatus is the *size* of picture to be taken. We are accustomed to see very large and beautiful photographs of scenery and architecture; but these would be impracticable for the traveller, as the dimensions of the plate increase so materially every portion of the apparatus. Differences of opinion and of taste may exist as to the degree of inconvenience it is worth while putting up with; but the writer of this paper, after considerable experience, has come to the conclusion that the smallest size in ordinary use—namely, the *stereoscopic* plate—is by far the most eligible one for travelling. The object is not to make large and valuable artistic pictures—that we must always leave to the professional man—but it is simply to preserve faithful representations; and this may be done as well on the small as on the large scale, and with infinitely less trouble. For, though the size is small, the delicacy of detail procurable with well-prepared plates, even in a large extent of view, is something marvellous, as may be easily seen in some of the magnificent stereoscopic views that are to be had in the shops; besides which, the stereoscopic effect gives an air of reality to the view which greatly enhances the value of the representation.

The camera for taking stereoscopic views has now been reduced, by ingenious contrivances, to a very portable size. The one used by the writer is nine inches long, five and a-half inches wide, and three inches high—about the dimensions of a good-sized octavo book. It weighs a little over two pounds, and hangs by a strap round the neck in walking with no inconvenience. The stand folds up into a straight stick, which is carried easily in the hand. A stock of eight plates, in slides ready for use (sufficient generally for a day's operations), go into two folding pocket cases. The tourist can thus walk about without the slightest sense of incumbrance, and is prepared, at any moment, to take a perfect stereoscopic view of anything he sees—an operation which will occupy him from five to fifteen minutes, according to the light, and the time he may take to choose his position.

Considered as adding to the baggage of the traveller, these things are hardly worth mentioning—as, with the exception of the stand (which travels well in company with an umbrella), they will all lie snugly in a spare corner of a portmanteau. Of course, however, a stock of plates must be added. A dozen of these, with appropriate packing, will occupy about eight inches long, four inches wide, and one and a-half inches high; and from this the space occupied by any number it is proposed to take on the journey may be easily estimated. Suppose there are five dozen—a pretty fair allowance—these, with camera and all complete, will go into a very portable hand-box, or into one of the small black leather bags now so common.

If the operator chooses to go to a little extra trouble, it is highly satisfactory to be able to *develop* the plates on the journey, which may conveniently be done in the evenings, at a hotel or lodging, and the apparatus for which adds very slightly to the bulk of the preparations. A small case of bottles, five inches square and two and a-half inches thick, together with one or two small loose articles, are all the author takes with him. The development of a plate takes five or ten minutes, and is a process easily learnt; and the satisfaction of being able to see, the same evening, what one has been doing in the day, is quite inducement enough to do it. But still, we repeat, this is not *necessary*, as the development may be left to another person and to another time.

We think we have shown how every traveller or tourist may be his own photographer, with much less trouble and difficulty than is generally supposed; and we must add that this is no untried plan. The writer of this article has been much in the habit of travelling; and, for years past, when he has gone on a journey, the little camera has been put into the portmanteau as unassumingly and as regularly as the dressing-case. It has travelled in all sorts of countries, and has cast its eye on scenes which camera never looked at before: it has been a never-failing source of interesting occupation and amusement, and has recorded its travels in hundreds of interesting views, some of much excellence, and very few otherwise than successful.

But it may be asked—since the advantage and usefulness of this plan are so undeniable, how is it that we do not see it in more frequent use? Simply for the reason that the dealers in photographic apparatus have never yet had the enterprise to establish a manufacture and sale of dry prepared plates in such a way as to ensure their popularity.

The manufacture and sale of photographic apparatus and chemicals is now becoming a very large branch of commerce; but many of the large numbers of tradesmen who prosecute it appear to have a much more earnest view towards the profits of the business than to the advancement of the art; for, since the death of poor Mr. Archer (to whom we owe almost entirely the present state of photography, and who lost a fortune in its improvement), nearly every advance made has been by private individuals. We must not be misunderstood. There are many people who profess to sell dry plates, and these may often be found to possess many of the requisites they should have; but few can be depended on, and *none* combine all the qualities which are necessary to give the system the full benefit of its inestimable value. Some will not keep long enough before exposure; some will not keep at all after exposure; some fail in sensitiveness; some spoil soon after they are opened; to say nothing of the constant liability to stains, irregularities, blisters, and all sorts of troublesome and annoying defects, which not only spoil the operator's work, but—what is of more importance—destroy all reliance on his operations, and so discourage him from undertaking them. We are not sure whether some dealers may not be obtuse enough even to encourage defects, from the short-sighted notion of increasing the sale; but this we can say—that we know no maker who will guarantee the sincerity of his wish to make good plates, by consenting to allow for them if they turn out bad ones. If this state of things arose from imperfection in the art we should not grumble, but could only urge improvement; but this is not so. It is well known that dry plates *can* be made, satisfying all the conditions we have named, and which, with care and system in the manufacture, might be rendered thoroughly trustworthy. It is only the indolence or obstinacy of the trade that prevents their becoming regular articles of commerce.

We do not wish, however, to discourage the traveller who may wish to adopt this admirable aid to his wanderings; for the object to be gained is so important that it is worth striving a little for. In the present state of the matter, he must either learn to prepare his own plates—which, after all, is no great exertion—or, if he buys them, he must at least learn to *develop* them, and must, at the same time, lay in with them a certain stock of patience and temper to meet disappointment; and we can assure him that, even at this price, he will find himself amply repaid. But we again urge that the case ought not to stand thus. The application of the dry processes to portable photography offers a boon almost inestimable to, but yet quite unappreciated by, the traveller and the tourist; and it only needs the zealous and earnest co-operation of the dealer, by so conducting the manufacture as to render it perfect and trustworthy, to raise this application into a branch of commerce of an extent, importance, and profit, little inferior to any in the trade.

Scraps and Fragments.

BROMIDE IN COLLODION.—A member of the North London Photographic Society says in a note lately received:—"I have been using bromo-iodised collodion lately with iron developer, and think it considerably slower than the simple iodide, though I think, as a rule, you get softer and better pictures. I much prefer fixing the negative before intensifying."

THE PYROGALLIC BATH.—A correspondent, referring to the Editor's remarks upon this subject in our last, reminds us that Mr. Archer referred to washing the plate with the pyrogallic solution immediately before exposure as a means of increasing the sensitiveness of the plate, in the second edition of his little book on *The Collodion Process on Glass*, published in 1854.

THE SOLAR CAMERA.—One of our staff writes:—"In a recent letter received from Mr. Atkinson, the well-known manufacturer of these, we were assured that he has applied artificial light in their use with uniform and continued success, and that enlarged prints by his plan may be secured all the year round with the greatest regularity and despatch. Such a consummation is, at any rate, 'most devoutly to be wished.' We ourselves had a negative detained by a professional operator with this instrument, for want of light sufficiently intense and uniform, some four or five months."

THE REV. J. B. READE, F.R.S.—A card-portrait of this gentleman—whose name is connected with the very early history of our art, as an experimentaliser and discoverer of several of the most important principles involved in its successful practice—has just been published by Messrs. Harvey, Reynolds, and Fowler, of Leeds. As there is always existing a considerable amount of interest relative to the personal appearance of those to whom we feel indebted for gratification, especially with reference to our peculiar hobby, we may safely predict a large demand for copies of the portrait under consideration.

OBITUARY.—From the *American Journal of Photography*, just received, we glean the melancholy fact that Mr. L. M. Dornbach, aged 30 years, expired at his residence in Brooklyn on the 23rd ult. The death of Mr. Dornbach was in consequence of injuries received by an explosion of gun-cotton, which occurred while he was pressing down the cotton in a case with a heavy stick, when a thrust, probably heavier than usual, ignited the mass. Mr. Dornbach was well known in America, and to some in this country, as a manufacturer of photographical chemicals, and as a writer on photographic subjects,—some of his contributions having been copied into this Journal from American sources. We call attention to this untimely removal from the scene of his labours of another active photographic worker, not only as a record of his departure, but also as a caution to those who have much intercourse with the highly explosive material, gun-cotton.

NEW PUBLICATIONS.—*The Recent Great Floods in the Fens*, photographed by Mr. Valentine Blanchard, will soon be laid before the public in some of the most interesting and picturesque phases of their devastating influence.—*The Lady Godiva Procession at Coventry* was photographed by Mr. Smith in a series of stereoscopic slides, the publication of which will, doubtless, shortly be announced.—Mr. Bentley announces a new work called *Sinai Photographed*, which must certainly prove very interesting, giving, as it will, photographs of the various rock inscriptions which mark the route of the Children of Israel through the desert and away from the bondage of the Egyptians.—Messrs. Day and Sons are busily procuring photographs of the *Master-pieces of Industrial Art and Sculpture at the International Exhibition of* 1862. These photographs being coloured after the originals, are then to be faithfully reproduced in chromo-lithography to illustrate a new work bearing the above title, by J. B. Waring, the dedication of which has been graciously accepted by the Queen, and the copies of which are to be limited to 2000, or such smaller number of copies as may be subscribed for before the close of the Exhibition.

DISDERI'S FORMULÆ.—Messrs. Harvey, Reynolds, and Fowler, of Leeds, give the following formulæ for the silver baths, developing solutions, &c., as recommended by Disdéri, from his extensive experience, as producing the best results. The manipulatory details do not vary particularly from those in general use. Silver bath for winter:—Pure nitrate of silver sixteen drachms, distilled water twenty ounces. Silver bath for spring and autumn:—Pure nitrate of silver thirteen and a-half drachms, distilled water twenty ounces. Silver bath for summer:—Pure nitrate of silver ten drachms, distilled water twenty ounces. Iron developing solution for negatives:—Protosulphate of iron sixteen grains, glacial acetic acid (50°) sixteen drops, distilled water one ounce. Pyrogallic developing solution for negatives:—Pyrogallic acid four grains, glacial acetic acid (50°) forty drops, distilled water one ounce. Solution for giving intensity, &c., to feeble negatives, to be used after the iron developer has been washed off:—Nitrate of silver fourteen grains, glacial acetic acid (50°) sixteen drops, distilled water one ounce. Solution for intensifying and clearing negatives that lack vigour, &c., from over exposure:—Bichloride of mercury one and a-half grains, hydrochloric acid three drops, chloride of gold one and a-half grain, distilled water one ounce. To be used after fixing. This solution should not be employed if a *large* number of prints are desired from the negatives, as from long exposure to the sun the negatives thus treated become opaque and hard in their details.

A NEW AND VALUABLE CONTRIVANCE.—A contributor says:—"At the studio of Mr. Hemans, in Coventry Street, we were recently shown a new camera designed by that gentleman for taking the portraits of children, and so contrived that the obtaining of the focus and the exposure of the plate are secured at almost one and the same instant of time, and without the operator moving from his place at the back of the camera. Three lenses, possessing exactly the same qualities of focus, &c., are made use of—two for producing two images on the exposed plate, and one for securing the focus on a piece of ground-glass, which is all its own. Of course the interior of the camera is separated into the necessary divisions. To do away with the black cloth, one of Ramsden's eye-pieces is fixed to a sliding shutter and arranged in connexion with the focussing-glass. The two lenses are covered and uncovered at once by a shutter acted upon by a rod with a milled head, turned from the side. The professional photographer, who knows the difficulties of getting children's portraits only too well, will appreciate Mr. Hemans' ingenious contrivance. We well remember how frequently we have obtained the focus of some too lively and intelligent child, and if we could, on the instant of obtaining it, only have exposed the plate all would have been well; but there has been the casting off of the black cloth, the removing and depositing in a place of safety of the focussing-screen, the getting and putting on of the cap of the lens, the putting in of the dark slide, the exposing of the plate, and then—*the doing of this all over again!* because that plaguy morsel of liveliness and intelligence had been following all our motions with his head and eyes, and so was entirely out of focus.

Entremets.

PHOTOGRAPHY AT SALES BY AUCTION.

IN these sales there is much that is very amusing to the photographer. The puzzled auctioneer vainly strives to seem quite at home with the articles he is putting up, and quite innocently makes the funniest of funny remarks in his endeavours to extol their various attractions and peculiar excellencies. Occasionally he—the photographer—smiles to see some raw but enthusiastic novice "just going to begin" purchasing articles at about ten or twenty per cent. above their fair market value—bidding, perhaps, as we once saw not long since, twenty, thirty, or forty pounds for some huge single lens under the fond impression that he is obtaining a treasure worth four times that sum at the very least, because he had inquired the price of a first-class portrait combination not *much* larger at an optician's, and remembered how the optician's answer quite took his breath away, so enormous was the sum he named. Poor fellow! to him a lens is a lens. What knows he of double and single combinations, spherical and chromatic aberration, French or English or other makers, &c., &c.? and his face beams with smiles as he pays his cash, takes the huge, unwieldy-looking photographic mortar under his arm, and goes his way rejoicing.

Then there are those never-failing attendants of all sales—the sons of "Israel,"—the keen of eye, and scornful of lips—looking cunningly at the auctioneer whenever a bid goes beyond the bounds of the reasonable, or shrugging their shoulders with a look of intense pity and astonishment directed towards the unreasonable bidder. These worthies have not yet mastered the mysteries of photography; and, taking care to keep on the safe side, they bid no more for a lens by Alexander Ross than they would for one of the commonest French makers', and regulate their bids for other pieces of apparatus simply and securely by the value of the probable materials of which they are made. These, again, are a great source of amusement to the photographic observer.

But although, in the metropolis at any rate, photography very frequently makes its appearance at auction sales, it is only now and

then that bargains of a genuine kind are met with thereat. We have known more than one cunning fellow who regularly purchased new apparatus to put into sales as second-hand, and so reaped no little profit. Ipswich contains a gentleman of repute who did not think this kind of "dodge" beneath his notice, and who now boasts of large sums reaped by such ingenious morsels of speculation. We have heard the same stories told of American auctions. Bargains, however, *are* met with, and we know several photographers who earn a very good income by attending sales in which photographic apparatus form one or more of the lots; but these are as well initiated in the mysteries of auction rooms as they are in those of photography: hence their success.

We duly attended, on behalf of this Journal, the recent sale of Mr. Lake Price's apparatus, &c., and now make our readers acquainted with the result. The backgrounds and accessories for the glass room commanded, on the whole, very fair prices. Of the former we heard more than one photographer present exclaim, deprecatingly—"How faint and indistinct! *I* would not give much for that!"—a feather which told how their taste blew in these matters. The stuffed animals so intimately associated with Robinson Crusoe and his man Friday, as seen in the specimen photographs exhibited at the same time, made their appearance, with others, and were sold for somewhere about two pounds for the lot. Baths, dishes, printing-frames, glasses, and camera-stands followed, and seemed to command a ready sale. A number of cameras by our best makers, many having contrivances of an attractive and ingenious character, followed in due course, among which was a very valuable instrument for pictures 30 by 30, which, with a handsome mahogany stand, sold for £23. A very fine collection of lenses was sold at very fair prices indeed, and also twenty-five of Mr. Lake Price's finest negatives—some, such as *Don Quixote in His Study*, and the *Robinson Crusoe* series, already well known, and others yet unpublished. The proceeds of the sale amounted to between seven and eight hundred pounds. Among the unpublished negatives was one, called *The Old Falconer*, which is as fine a specimen of art-photography as we have ever had the pleasure of inspecting; whosoever got it for £20 had a bargain. Most of the negatives were knocked down to purchasers who did not attend the sale. The auctioneers were Messrs. Puttick and Simpson, Leicester Square.

A PHOTOGRAPHIC JOKE.

A FRIEND of ours, being with an exploring party in Assyria, played the following joke off upon his companions (you must know that our friend was with the party as draughtsman, and to aid his labours, like one wise in his generation, also made use of his skill as a photographer):—Returning with some sketches and photographs one day, he exhibited what was regarded by the whole party as one of the most marvellous and interesting of their many valuable discoveries. This was seemingly a paper negative from one of those peculiar Assyrian sculptures which speak so mutely, but eloquently, of the mighty peoples of old. Strange to relate, it was palpably intended for an image of Nebuchadnezzar in the hour of his degradation to the level of a beast, and was as faithful a realisation of the Bible description as could be imagined. Great was the joy of the little party, and noisy was the stir it created; until the artist and photographer laughingly exhibited a very clever and deceptive water-colour sketch, on rough granular paper, from which the photograph had been obtained. Not long since, attending, in a country town, a lecture upon recent discoveries in Assyria, we were amused by seeing one of the prints from this negative brought forward as illustrating the literal truths of the Great Book. How it was obtained we know not: many copies were certainly circulated among the personal friends and acquaintances of the artist, and some one of these may be responsible for the hoax for aught we know to the contrary. It made a profound impression upon the audience, and may yet turn up again in some very similar manner. A negative from the original drawing is now in the possession of Mr. A. H. Wall. R. A. S.

Meetings of Societies.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A MEETING of the Council of the Amateur Photographic Association was held on Monday, the 7th instant, at 26, Haymarket,—the Right Hon. the Earl of Caithness in the chair.

The minutes of the last meeting were read and confirmed.

The SECRETARY then laid before the meeting the prizes of the Association, consisting of a highly ornamented claret jug, and a plainer silver mounted ditto, three silver goblets, and two silver inkstands.

The CHAIRMAN having reported that his Royal Highness the Prince of Wales had graciously condescended to become the President of the Association, he was elected by acclamation, and the Secretary was directed to address a letter to his Royal Highness expressive of the great satisfaction experienced by the Council at his condescension.

The following Vice-Presidents were elected, viz.:—The Most Noble the Marquis of Drogheda, the Right Hon. the Earl of Caithness, the Right Hon. the Earl of Uxbridge, and the Right Hon. the Viscount Ranelagh. Also, Lieutenant-Colonel Fitzgerald de Ros and John Gooch, Esq., members of Council.

The SECRETARY then laid before the Council the names of the following Members and Subscribers who have joined the Association since the last meeting:—Dr. Diamond, G. W. Simpson, Esq., Lord Carew, Lady Carew, the Hon. Naussau Joscelyn, Colonel Challoner, Major J. Wingate, Captain J. C. Bonamy, Captain R. J. Henry, Captain Arthur Burnaud, Captain Fairlie, Rev. W. Law, Rev. W. Eardley, Rev. H. Salway, John Gooch, Esq., W. L. Banks, Esq, W. W. King, Esq., O. King, Esq., W. M. Barnes, Esq., F. Chambers, Esq., F. Beasley, jun., Esq., C. Walters, Esq., W. Jeffrey, Esq., W. H. Bullock, Esq., S. J. Wethrell, Esq., R. A. Cayley, Esq., R. B. Bonman, Esq., G. Burd, Esq., W. Y. Owen, Esq., J. H. Page, Esq., W. Weare, Esq., J. W. Fall, Esq., C. J. Tozer, Esq., W. H. Harton, Esq., Miss. E. Scott, C. Topham, Esq., G. Hamilton, Esq., Miss Clough, C. R. Jones, Esq., A. Eichholtz, Esq., C. T. Dickenson, Esq., H. Boycott, Esq., D. White, Esq., Jas. Page, Esq., A. Fewtril, Esq.

The Right Hon. VISCOUNT RANELAGH having inquired whether professional photographers were eligible as *members*, was informed by the SECRETARY, that *amateur* or non-professional photographers could alone become members of the Association. This having given rise to a discussion upon the mode of admitting members, it was decided that henceforth candidates for admission as members or subscribers must be proposed and seconded by existing members, and elected by the Council.

After the consideration of other matters relating to details of administration, &c., the proceedings of the meeting terminated.

Foreign Correspondence.

Paris, July 11th, 1861.

THE French Society of Photography held its last meeting for the season on Friday, the 4th inst. What proves the attention that is being given to instantaneous processes in France, as well as in England and America, is the fact that three communications were made that evening on instantaneous shutters and an apparatus similar to Mr. Skaife's pistolgraph. The first shutter was presented by M. Humbert du Mollard, and is intended for stereoscopic objectives. It is simply a blind lifted by means of a knob, which sets a little cog-wheel in motion. A spring which the operator pushes allows the stuff to spread out rapidly and without the slightest jerk. The system is simple, and works easily and surely. M. Antonini, an officer of the *Chasseurs*, has contrived an apparatus of quite a different construction, which he has found very serviceable. His shutter is composed of two copper discs, joined together by a semi-circumference of the same metal, which turns on a fixed pivot. A metallic rod, with a head to it, communicates with a clamp, which keeps the whole motionless when the objective is uncovered. On turning this rod the clamp is displaced, and the whole of the shutter, drawn by a weight fixed at the top, makes a circular movement as it falls, so that the light passes rapidly over the whole surface of the lens through a crescent-like aperture between the lower disc and the semi-circumference. It is very difficult to describe such instruments without diagrams. I hope, however, that this explanation will not be incomprehensible. M. Antonini's model was constructed in a somewhat rough style, by a soldier, and yet it works perfectly well. The *pistolgraph* presented by M. Brivis, which is much the same as Mr. Thompson's, is more complicated, so I will not describe it: besides, the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY are sufficiently acquainted with the kind of instrument, to render description unnecessary.

M. Adolphe Martens, Professor of Natural Philosophy, amongst whose favourite studies photography holds the principal place, has been experimenting on the tannin process, and that with admirable success. To develop the image, he pours the cold solution upon the warmed glass. The same gentleman communicated to the obtains from it effects as energetic as from sulphate of iron. His meeting a method of developing with pyrogallic acid, by which he modification of the developing bath consists in the addition of alum. The bath is composed of 380 cubic centimetres of non-calcareous water, ten of alcohol, and one gramme of pyrogallic acid. To twenty cubic centimetres of this mixture, he adds twenty-five grammes of alum, dissolved in 500 grammes of water.

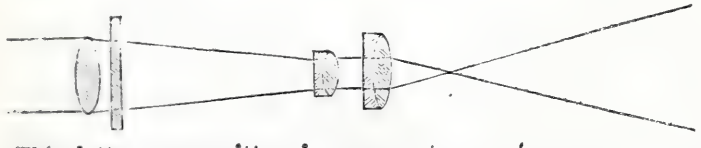
M. Voyteau exhibited a new system of screen for graduated grounds. It consists of thin sheets of transparent paper, each with an oval aperture in the middle; these are placed one upon the other in such a manner that the sheet with the smallest aperture is at the bottom. The ovals being of graduated sizes, it follows that the light has to pass through a thickness increasing from the central opening to the margin, which corresponds with the margin of the picture. In this manner an harmonious gradation is obtained, and the printing can be done just as for plain grounds.

I have lately seen, in M. Martens' operating-room, a series of views taken by that gentleman during a recent tour in Switzerland. These landscapes are nowise inferior to the works which have established the reputation of this veteran of French photographers. If M. Martens has sent nothing to the Universal Exhibition, it must not be supposed that he has ceased to practise an art in which he has been so successful. He has thought—for he is a philosopher as well as an artist—that he has hitherto had his fair share of rewards, having obtained the grand medal in 1851, and, somewhat later, the decoration of the Legion of Honour. He has, therefore, left the place to new comers. Is this from pride or from generosity? The talent of M. Martens allows us to admit both suppositions.

Apropos of the Exhibition, nothing positive is yet known of the recompenses awarded to French photographers. Two nominations for the cross are talked of, and one of the names mentioned will certainly be well received in England. I cannot, however, speak more precisely at present on a subject which, naturally enough, occupies the thoughts of so many. ERNEST LACAN.

Philadelphia, June 23, 1862.

WITH summer has come abundance of sunshine, and photographers are rejoicing in the flood of bright light—helping them in their glass rooms, at their printing windows, and, most of all, with their solar cameras. Speaking of the last-named instrument, I will take the liberty of quoting a part of a recent letter from Professor O. N. Rood, of Troy, New York, bearing date June 11, 1862:—"For a long time past I have been in the habit of enlarging negatives by photography from five to twenty diameters, and am of opinion that but little detail is lost if the operation be properly conducted. The first copy or positive I make with a bright light and as short an exposure as possible; the second copy or negative is, on the contrary, exposed as *long* as practicable. When this rule is observed there is no difficulty in obtaining an enlarged negative nearly double the intensity of the original one. The lenses ought to be plano-convex, and similar in make to those used in microscopes. As you state, I often employ a lens of rather long focus, nearly in contact with the negative, for the purpose of obtaining a larger circle of illumination. It should be adjusted so that its focus for parallel rays falls a little behind the objective, its use being much the same as the large bull's-eye in the magic lantern." He appends to his letter a sketch of this arrangement.



This letter was written in answer to one from your correspondent, desiring his opinion regarding the solar camera. The information he conveys in his letter is useful; but he does not give an answer to what I most desired to know, viz.., Does the condensing lens of the solar camera, if chromatic, interfere with the chemical focus of the portrait tube used in the system? My letter to him may have been written in too much haste, and no doubt the questions were not clearly put. With us, direct printing with the solar camera is much more in vogue than the enlargement of negatives, as I have before said. In my own limited circle of acquaintances I can find none who dispute its value, and all seem to concur in the opinion that enlarged prints from small sharp negatives are better in every respect than prints from large negatives. This is in especial reference to portraiture; for comparatively little has been done with landscapes. Mr. O. H. Willard made a trip to the mountains of Vermont and to Niagara, two years ago, and brought home with him a large number of views $6\frac{1}{2} \times 8\frac{1}{2}$ for his solar camera, and these he enlarged to the full size of ordinary Saxe-paper, producing remarkably fine pictures. In ordinary landscape photography, where prints are to be made by contact with the negative, there seems to be much trouble experienced in bringing up the detail of the foreground without fogging the extreme distance. Those negatives made for the solar camera which I have had an opportunity of examining, were made with collodion giving no intensity but plenty of detail—were being also made quickly, and not forced in the development, and not over-exposed in the distance.

From time to time we have been promised a sight of those wonderful view lenses, of short focus, which Mr. C. C. Harrison has been making. Some have doubted their very existence; but those who have been allowed to try them are loud in their praise. I have before me about thirty stereographs made with these lenses by various operators, and all are striking pictures. Among them I might mention an interior of Anthony's store, in Broadway. The nearest objects are not five feet from the camera, and all, to the extreme end of the long room, are in focus; and, from the large angle embraced by the instrument, the whole room seems in view. Mr. Nelson Wright, Broadway, New York, has made arrangements to manufacture these lenses. The factory is under the immediate superintendence of Mr. C. C. Harrison; and Mr. Wright says they have now determined on the prices, length of focus, &c., for two sizes—one for taking stereoscopic pictures, and the other to cover an 8×10 plate.

The first will have a focal length of about two and one-half inches, a circle of light of five inches, and will make a negative in about 12 or 15 seconds. These lenses will be matched in pairs, and will be sold at about $50 per pair.

The size for an 8×10 plate will have a focal length of eight inches, a circle of light of 16 inches, and will square a perfect 10×10 picture. Mr. Mathiot, of the United States Coast Survey, Washington, some weeks since experimented with one having a focal light of twelve inches, and it would make a larger and better copy than his orthoscopic of twenty-four inches focus, and would work in half the time.

In mentioning these lenses, I can give no opinion regarding them, save from the work done by them in the hands of others; and I am free to confess that I have never seen better, nor even so good work, as far as the instrument is concerned. I have a landscape, with horses in the foreground, said to have been made with these lenses in less than one second, and with an opening of only one-eighth of an inch.

Some doubts have been expressed as to the correctness of their principle of construction; but with these the old adage holds good—that "the proof of the pudding is in the eating." The chemistry of photography is doubtless an experimental science; and, to some extent, so also is the optical department of the art. Were this not so, theory and mathematical calculations might long ago have pointed out the most perfect form of lens: as it is, each change for the better is the result of experiment, suggested of course by theory, but perfected by careful trials of forms and qualities of glasses.

In applied protography, we may mention that photographic enlarged copies of the wood-cut illustrations of medical text-books are being used in some of the colleges, and meet with favour. The prints are from negatives 14×18, and can be readily seen by the students in all parts of the class-room. Mr. A. Hemble, of Philadelphia, has made a considerable number of these pictures.

When I look back at what has been said about quick dry plates—how sure we have been that the true process had been discovered, and, again, how disappointed we have been when these quick plates proved so very slow—I cannot help thinking that the subject is, and has been, the all-engrossing pursuit of our amateur photographers for months past. The accounts of Dr. Draper's hot water process are as contradictory as ever. But if my letters to THE BRITISH JOURNAL OF PHOTOGRAPHY were examined, it would be found that each alternate letter seemed to bear testimony now for and then against it. These letters are intended, as far as possible, to be the index of the state of the art in America, and must therefore echo the sentiments of our leading photographers. In my last I quoted a letter to show how little good was to be derived from the hot water; and now, this week, two professionals of Philadelphia return home from a trip among the mountains of Pensylvania, and they are full of the hot water process. One says he graduates the heat to the time of exposure: the shorter the exposure has been the hotter he uses the water to soak in. He has made good tannin negatives with five seconds' exposure.

In writing of this hot water soaking and cold developer, I have always called it Dr. Draper's process, and all on this side of the Atlantic think that to him is due any credit that may be attached to it. Hot development, *i.e.*, the developer heated, has been used by many in America, the idea, perhaps, having been derived from European journals. Some weeks ago, my attention was called to an article in one of the English journals, accusing

us of taking to ourselves the credit of what had been long known, used, and published in the English journals, and even copied into the American journals. This was all in allusion to Dr. Draper's discovery, and one of my letters to THE BRITISH JOURNAL OF PHOTOGRAPHY was quoted in support of the assertion. To show how grossly ignorant is your correspondent in all that relates to the art as published, he is referred to an article copied into the *American Journal of Photography* last August, in which the hot water is mentioned. This is all very true as far as the hot water is concerned; but, unfortunately, the writer of the article in question insists that after the plate has been soaked in *very hot water*, the developer (here he gives the formula) must be poured on VERY HOT TOO. This, of course, is Dr. Draper's process, only with a *very slight difference*, that *slight difference* being the important part of Dr. Draper's claim. I should not have alluded to this, had I not been urged to do so by many of my dry friends, who do believe in the hot water and cold developer, and who, claiming some knowledge of written photography, say that Dr. Draper was the first who published the process. Independent re-discovery of old things is going on all over the world, and it would be strange if mistakes were not sometimes made in ascribing merit to discoverers.

In my letters to THE BRITISH JOURNAL OF PHOTOGRAPHY I shall at all times state what we do and how we do it, and others may decide in what country the ideas have originated. With us it is a standing assertion that nothing American is ever adopted in England unless some authority can be hunted up to prove that it is an old idea—at least on the Continent, if not in England: *vide* recent adoption of rotating iron turrets on iron-plated ships in the British navy. There is another case in point. Years ago Mr. Rembrandt Peale, of Philadelphia, placed a picture anonymously in one of the London exhibitions. It was much admired and credited to this or that English artist. Finally, when it was announced as the work of a young American, the press acknowledged that they were mistaken, but claimed it as the work of a pupil of "OUR great painter, Benjamin West!"—forgetting that West himself was an American.

The *Philadelphia Press* of June 21st tells us that a new application of miniature photographic portraits has originated with Messrs. Whilt and Yost, the extensive Bible manufacturers, of Market-street, Philadelphia. In their Bible—the text of which is conformable to the standard of the American Bible Society—they insert, as usual, blank leaves, suitably headed and divided for notices of births, deaths, and marriages. Such records in a family Bible constitute good evidence in our courts of law. In addition to these they are introducing the novelty (patent applied for) of placing several card-boards, perforated for the reception of small photographic portraits, to follow the family register, thus accompanying the record with resemblances of the loved ones whose names are entered there. The idea is ingenious, and will, no doubt, meet with favour. The specimen alluded to is a superbly-bound quarto illustrated Bible, in clear pica type, with index, concordance, metrical version of the Psalms, with places, after the register, for the reception of thirty-two *cartes de visite*.

Among the American amateurs are many who have studied and practised photography for the purpose of accomplishing some one scientific object: this ended, they have abandoned the art. As an instance of this, I will mention Captain Rodman, of the United States Ordnance Department. This gentleman demonstrated the practicability of casting cannon of unusual size by cooling them in a peculiar manner. He casts them hollow and cools them from the inside. In his experiments with various kinds of iron at the Fort Pitt Foundry, it was necessary that he should submit the different qualities of iron to various tests, such as would show its tensile strength, also its ability to resist crushing force and bursting pressure. To keep a more perfect record of these experiments he called photography to his aid, and made pictures of his specimens both before and after each experiment. These photographs are preserved on a file, and from them were made the illustrations which accompany his valuable work on the subject of metal for cannon and on gunpowder. All the labour of making the first of these photographs fell on Capt. Rodman himself, until he was able to teach one of his junior officers to do the work to his satisfaction.

You have, no doubt, seen by this time, that the publisher of *Humphrey's Journal* has abandoned his quarto form, and come back to the old octavo. I for one am glad of it. It was in that journal your correspondent began his experience as a writer, and he has to thank Mr. Ladd for the care with which his articles were put in print. When the journal was converted into a newspaper sheet it was like parting with an old friend. COLEMAN SELLERS.

Correspondence.

FARADAY'S PORTRAIT.

To the EDITOR.

SIR,—In a paper read by M. Claudet, at the last meeting of the London Photographic Society, *On the Enlargement of Photographs*, and published in THE BRITISH JOURNAL OF PHOTOGRAPHY of the 15th ultimo, it is stated that M. Claudet exhibited a large portrait of Professor Faraday as an illustration of the success of the apparatus he employs.

I must say I was not only surprised, but shocked, on reading the deception practised on the meeting; and, as I chance to know exactly how the said portrait was produced, will you kindly allow me a portion of your valuable space to inform the readers of the Journal.

The canvas as delivered to the artist certainly had some scribbling upon it, but so execrably bad that every touch of the pencil had to be obliterated, and the whole drawing done by the artist from a small photograph by his side. The painting, I admit, is well executed; but M. Claudet must not try to mislead the public with the idea that either his apparatus or drawing has anything to do with the result, the whole credit being due to the artist who began and finished the portrait the same as he usually does from nature; and if the others in the International Exhibition, of which M. Claudet speaks, have been executed in the same way as Professor Faraday's, then I hold they have no right to be there, and the space ought to have been more suitably occupied with something pertaining to photography.—I am, yours, &c.,

44, *Regent Street, London, June* 26, 1862. J. G. MACANDREW.

[We do not imagine that M. Claudet was aware that his sketch on the canvas had been obliterated, but presume he was really under the impression that it had been of service in conducing towards the result attained; but, with regard to the other point raised, even supposing the painted portraits to have been produced exactly in the manner described by M. Claudet, we hold that they are quite erroneously included in the photographic collection, being only connected with the art in so remote a degree that it requires a very long stretch of courtesy to recognise their affinity, certainly not their kindred.—ED.]

A LIGHT QUESTION.

To the EDITOR.

SIR,—A few days ago I was surprised by hearing from a professional photographer what was to me a novel theory in regard to light, which, if true, ought to be better known, but which, if not true, ought to be checked. I take the liberty, therefore, of asking a small space in your columns for its consideration. The theory is to this effect: that if white light be unavoidably admitted to a tent or other operating chamber through the pores of the cloth which forms the tent, or otherwise, in such a quantity as would be sufficient to *fog* a sensitive plate under manipulation, the prejudicial effect of that light may be prevented by increasing the quantity of yellow light—say by enlarging the surface of the window through which yellow light is admitted.

Now, according to all my old notions about light, such an idea seems entirely wrong, as I have been under the impression that *light* of every kind or colour has some amount of actinic influence; and although yellow light of a particular shade has so little as to render it practically harmless to sensitive plates if kept within proper limits—even it may be used in too large a quantity, and its effects rendered visible by fogging; but, even supposing the increased amount of yellow light to do no harm, how can it counteract the white light?

There is no doubt that no more water can be put into a vessel than will just fill it, and that sand may be introduced and the water *displaced* to a very large extent; but, because this principle applies to ponderable substances, does it follow that it also applies to light?

I fancy that light, being imponderable, may be admitted in any quantity into a chamber, and still leave room for more, of any colour; but unless there could be *displacement* of the original light by the admission of coloured rays, as in the displacement of water by sand, I cannot see how the actinic influence present all along is to be kept from acting.

I am quite in the dark: can you enlighten me?—I am, yours, &c.

Edinburgh, July 8, 1862. G. H. SLIGHT.

[See paper by Mr. Taylor in this number. We shall probably have somewhat to say on this subject in our next.—ED.]

THE "BULL" AND THE "WALL."—PHOTOGRAPHIC PATENTS

To the EDITOR.

SIR,—Our friend Wall has been rather severe lately on the profile columns, vases, &c., supplied by Messrs. Bull and others. Now these said articles are very useful in their way, and can be used sometimes where solid ones could not; and the public do not, except in a few instances, stop to consider whether they are in perfect drawing or in keeping. Still, if they were painted nearer to nature, with less intense shades and glaring high lights, they would give greater satisfaction, and not offend the eye of taste. The patrons of the art photographic would then have with their portraits accessories that would seem to belong to the picture, and not, as at present, forming no part of it in an artistic sense.

In writing thus I have no further interest than the general good, as I paint my own for use only, and not for sale.

Can you tell me, Mr. Editor, wherein consists the novelty of Mr. McLachlan's patent for the arrangement of blinds for the glass room? That same arrangement of vertical blinds on iron frames I have seen in use in Cheltenham seven years ago, and used them myself at Gloucester a little time after, also down here frequently—that is, if I understand rightly the description given in THE BRITISH JOURNAL OF PHOTOGRAPHY.—I am, yours, &c.

Swansea, July 9th, 1862. THOMAS GULLIVER.

TANNIN PROCESS.

To the EDITOR.

SIR,—In Major Russell's instructions for development it is advised that from *one* to *six* grains of citric acid be used to each grain of silver. Although the weather has been very cold recently, I have found that, with equal weights of silver and citric acid (however small the quantity added to the pyro. developer), there has been great tendency to fogging of the high lights. I spoiled several pictures before dreaming of the cause. *Three* grains of acid, however, to the ounce gave excellent results.

I must add that I used a *weak* solution of tannin, thus reducing the minimum of acid. With a stronger solution of tannin, and hotter weather, I should fancy, therefore, three grains of acid to one of silver would be insufficient. The pictures developed with the larger proportion of acid are *much sharper* than the others.

The acid not only retards development, but apparently causes the silver to be deposited in much finer particles. This may be of interest to those who take their negatives with a view to subsequent enlargement.

I am, yours, &c., D. H.

"PRINTING" QUERIES.

To the EDITOR.

SIR,—Will you be kind enough to inform me, through your Journal—

1. How much nitrate of silver a sheet of albumenised Saxe or Rive paper takes up from the sensitising solution (strength 80 grains to the ounce)?

2. Is it an essential that paper should be rolled after albumenising?

My reason for asking the latter is the being in a part of the country where eggs can always be had fresh and in plenty, and commercial albumenised paper generally being not much to be depended upon, I have often thought of trying to prepare it myself, but the idea of machinery has frightened me off it. I suppose that pictures rolled after mounting would come to the same thing.

3. What is the cause of the appearance of the enclosed print? and what is the disease?—I am, yours, &c., N. B.

[1. The quantity consumed depends to a considerable extent on the amount of chloride in the albumen. If you reckon three grains of nitrate of silver for each grain of chloride in the albumen you will not be wide of the mark; or, without reference to the absolute strength of your nitrate solution, but assuming it to be sufficiently strong to work with the paper which you are using without its becoming unduly impoverished, you will find about two and a-half drachms consumed by each *whole* sheet of paper.

2. Subsequent rolling will do.

3. A malignant case of "photographic measles," arising from *too weak* a solution of hyposulphite of soda for the fixing bath. Your stereograph of the *Jed* but for that fault would have been a charming production.—ED.]

CRITICISING THE CRITICS.

To the EDITOR.

SIR,—Do you not think it is somewhat indecorous to bring the name of T. R. Williams so constantly and prominently before your readers? Of Mr. Williams's excellence I make no question; but when, in number after number of your Journal, he is held up before us *by name* as *the* super-excellent example, I cannot but consider it unfair to other photographers.

The converse of the same strikes me, though in a minor degree, with regard to M. Silvy. You lose no opportunity of "having a cut" at him, whereas I think there can be no doubt whatever in the mind of any unprejudiced person of the very high degree of beauty exhibited in that operator's portraits, though I have so often been disappointed in his work for *private persons of no note* that I now never recommend him. I have no interest whatever, nor any prejudice either, for or against any photographer: it is simply a sense of justice which makes me address you.—I am, yours, &c., AN AMATEUR.

[We are always glad of an opportunity of "seeing ourselves as others see us," because it enables us either to correct our own errors or the misapprehensions of our readers, should any exist. Will our correspondent oblige us by indicating by quotation of volumes and pages where we have "*constantly* and prominently" placed Mr. T. R. Williams's name before our readers?—say half-a-dozen times, by way of sample. Certainly we have not deemed it needful to suppress the mention of this gentleman's name when it has been coupled with praise by some of our contributors, entertaining, as we do, a high estimation of his skill as a photographer; but we have as certainly never "held him up as *the* super-excellent example," for the simple reason that there are several (though, we admit, not very many) professional portraitists whom we place in the same rank with Mr. Williams.

We fear our correspondent is not more accurate in his assertion with regard to the other gentleman to whom he alludes. We have no prejudice against M. Silvy personally; indeed, we barely know him by sight, and are not acquainted with him. If we had a desire to act towards him as our present correspondent imagines, *opportunities* are not wanting for the purpose.

M. Silvy wrote an article in the pages of a contemporary calculated, in our opinion, to degrade our art. We felt it our duty to oppose that article, and acted accordingly. We read a foolish article in *All the Year Round*, in which the author preposterously asserted that the only photographer in London who understood the art of lighting his subject was M. Silvy—an assertion which, besides being ridiculous, conveyed a gross libel upon several of M. Silvy's superiors in artistic skill (according to our judgment)—and we wrote, not in condemnation of M. Silvy, but of the author of an article which was either a most glaring puff or the offspring of presumptuous folly. That some at least of M. Silvy's portraits do *not* possess "a high degree of beauty," our correspondent himself admits, he having been "often disappointed" in them. We cannot assert as much, never having experienced disappointment owing to having had no particularly exalted expectations; but we have often seen portraits by that operator which do not possess any beauty at all, and which are certainly inferior to many by Robinson, Williams, Kilburn, Mayall, and several other English photographers—consequently we reaffirm that which we before asserted, namely, that the attempt to attribute to M. Silvy alone a knowledge of *chiaroscuro* could only have proceeded either from the desire to write a "puff" or from sheer ignorance.—ED.]

ANSWERS TO CORRESPONDENTS.

*** A number of Articles, in type and M.S., are left over for want of room.

J. J.—Declined with thanks.

A.—We are unable to comply with your request.

ATTICUS.—We have not seen any Grecian views.

CHAS. LAVEY.—Add a drop or two of dilute tincture of iodine.

RECEIVED.—O. C., LÆVIS., R. F. T. Also several others, too late for reply.

T. JAMESON.—We have never heard of any photographer of note of the name mentioned by you.

SAMBO.—Send one of your spoiled prints, and we will try if we can discover the cause of your unsuccess.

ADMIRER.—Mr. Rejlander is now permanently located in London, and may be found daily at No. 6, Haymarket.

S. M. W. (Falkirk.)—The Editor's address may always be found in the last page of the Journal above the list of "Contents."

C. M. T.—We have been informed that the subjects taken by Mr. Bedford in the Holy Land will be published in due course.

JUVENIS.—It is an indication of your having added too much iodising solution: a little more plain collodion will rectify the inconvenience complained of.

S. M. W.—Exposing your proofs to daylight while in the toning bath is a fruitful source of discoloration, and the specimen you have sent bears the appearance of having been thus spoiled.

GLASGOW PHOTOGRAPHIC SOCIETY.—"A. R." says:—"A new society is to be commenced very soon. The busy season has kept us from getting started; but I expect we shall get on well by-and-by."

G. L.—1. We have very recently given the information for which you ask: see number 120, 15th February last.—2. Send a small portion of the material, and we will see if we can throw any light upon your doubt.

THOMAS QUINCY.—You have been misinformed. The gentleman to whom you allude, though a professional photographer, is not a professional portraitist. He has repeatedly declined to undertake that branch of the art.

ISLINGTONIAN.—The Mr. George Dawson whom you have heard lecture at the Institution is only a namesake of our contributor; though, oddly enough, both have appeared at Myddleton Hall, but in different parts of the building.

NOVICE.—No. 1 is a bad case of "measles."—No. 2. Your exciting bath was too poor in silver. No 3. Paper contains particles of metal: if you hold it up to the light you will perceive that each white speck contains an opaque nucleus.

DRY PLATE.—You can scarcely adopt a better formula for your iodising compounds for the pupose you indicate than that of Mr. Heisch, which is as follows:—alcohol one ounce, fifteen grains iodide of ammonium, five grains bromide of ammonium, one and a-half grains chloride of calcium.

ROVING ROB.—We recommend you to procure a tourist's ticket for a month by the Great Northern route. You can take it for the whole distance, and may break your journey once, if not twice, sleeping one night at York and the second at Perth, if you do not arrive in time to go on.

PROVINCIAL.—We regret that you will not arrive in London at a time when the North London Photographic Association is holding its meetings, as we should have been happy to have introduced you as you desire; but, if you will send your address when in town, we will endeavour to meet your views otherwise.

JOHN RAVEN.—We can tell you how to apply your preservative solution to a much better purpose than dry plate photography, viz., add a little flour, and put it into a frying-pan over the fire: when cooked it may be eaten. Do you fancy we are so simple as to publish such an absurdity as a recommendation to use a solution (?) of butter, albumen, and salt as a preservative? You must be either attempting to hoax us or or be the victim of a hoax yourself.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 171, Vol. IX.—AUGUST 1, 1862.

Photography One of the Fine Arts.—Our readers will, no doubt, be gratified at learning that Photography has at length been recognised as one of the Fine Arts; not that we can affirm as much of our own knowledge, nor do we very clearly perceive how the case is made out; but our friend the Secretary of the Photographic Society—himself also a juror appointed by the Royal Commissioners for the International Exhibition—says so; and, consequently, being so great an authority, he surely ought to know. However, to avoid any possible chance of misleading our readers, we will quote Dr. Diamond's own words from his last leading article in the *Journal of the Photographic Society*:—

"But the fact of all others, and before all others, on which the photographer will dwell with pleasure, is the public recognition which his favourite study has obtained. After a long battle with the guardians of established rights, the Italy of the Arts, as we may now fairly term photography, has made good her pretensions, and received her place. We are a class of ourselves; we take our place with oil-painting, with sculpture, with engraving, with design. We do not blame the conservators of privilege who contested our right to the rank we have now secured. We are a very young art: the sisterhood are proverbially and properly jealous of intruders: our pretensions were high, and we will not raise any objections, now that we have gained our point, against those who put us to our probation. It was their duty to see whether we had enough vitality in us to bear the day of trial and to work down opposition. We have done it. Our Palestro, our Volturno, have been fought and won: peace has been made."

If we take these words in their natural sense we can come to no other conclusion than that stated at the commencement of this article.

Photography, "the Italy of the Arts," has "received her place" * * * "with oil-painting, with sculpture, with engraving"—a very broad and distinct assertion; but we should have been better satisfied had our worthy friend assigned his reasons for making it, or pointed out when and where the desired recognition occurred: certainly there is nothing in the rest of the article cited to indicate either time or place. We should have probably been, for the present, contented with the bare announcement from such an authority, but for its surroundings. Subsequent to the paragraph we have quoted, there is an account of the award of prizes on the 11th ult.: prior to it an allusion is made to "a selection of fine pictures from many nations, unrivalled for number and for beauty," at "the Palace (!) in Cromwell Road." Where can this be? Surely our good friend cannot be so beside himself as to dignify the miserable union-workhouse-looking edifice, with the huge dish-covers at either end, by the designation "Palace." This cannot be. He has too much good taste for that—unless, indeed, he has been altogether in an atmosphere of nitrous oxide, and his imaginative, poetical fancies have been stimulated thereby; but, if so, we tremble for the position photography has so recently obtained as one of the Fine Arts, when the exhilirating effects have passed away and sober truth confronts him with stern reality. There is one other fact which adds uncomfortably to our misgivings: we give in another page an analysis of the "award of medals" and "honourable mention," compiled from the official document issued by the Royal Commissioners, and in the original we find that rewards for photographs, apparatus, and photographic chemicals, are all mixed up in inextricable confusion; consequently, if the large number of exhibitors noticed in Class XIV. be regarded as a recognition of the Art-claims of photography, we do not perceive how the conclusion can be avoided that opticians, camera-makers, and chemists are Artists as well as their brethren the producers of pictures. Truly, however, this award of prizes is another proof, if any more were wanted, of the persistent determination of the Royal Commissioners to ignore photography as a Fine Art; for, unless we are grievously misinformed, prize-medals are not given to exhibitors in that section of the collection at South Kensington.

We have no intention of criticising the propriety of the several awards made by the jurors; but we cannot forbear asking one question:—If photography be now publicly acknowledged as a *Fine Art*, how does it happen that Mr. O. G. Rejlander—whose claim to the title of "*artist*" is second to none in our guild—is only recognised by an "honourable mention?"

A Postscript on Literary "Annexation."—The editor of our contemporary, the *Photographic News*, has published two whole pages of what we presume he means for a defence in reply to our allegations against him. We regret that we are unable to afford the space to gratify him by reproducing it (with acknowledgment) *in extenso*. Our readers would no doubt have been edified at the extraordinary style of his reply, which he seems to think ought to hinge chiefly upon the difference which formerly existed between the proprietor of this Journal and the Photographic Society relative to the title—"*The Photographic Journal*"—which our legal adviser informed us we had a perfect right to use (an opinion that a legal member of the Society's Council admitted to be sound law), and which we discontinued because we agreed, *at the request of our opponents*, to be bound by the award of an arbitrator instead of compelling the issue to be tried in a court of law. What this has to do with our present complaint we are at a loss to perceive; but, as we find no proof adduced of innocence of the charge which we made—but, on the contrary, that which is virtually an acknowledgment of it—we presume that the *two* pages of original matter with which we have enabled our antagonist to fill his space have been called up "for strategic purposes." It is not easy to unravel the tangled web of reasoning, if such it can be called, in which he indulges. Three or four things are, however, apparent:—

Firstly. That although the editor of the *Photographic News* admits the name of this Journal to be a *modest* one (which is true), somehow he does not like it (perhaps for the reason that it is modest), and would have preferred its being called *The*

Photographic Ishmael—a vagary in which we can scarcely indulge him with propriety. He says, also, *it* "dubbed" *itself* THE BRITISH JOURNAL OF PHOTOGRAPHY—a feat that we should like to have seen *it* perform, though we are not quite sure that we understand the exact process of "dubbing."

Secondly. The editor of the *Photographic News* affects to imagine that we are ashamed of our connexion with Liverpool, and insinuates that he would not feel so—(we should think not)—knowing full well that we are proud of it. But when our articles are copied by him, or any one else, we have a *right to demand* that they shall be acknowledged as extracted from this Journal under the name of our own choosing. In any other kind of reference that he may please to make to us of course we have neither the power nor the inclination to prevent his adopting his own eccentric nomenclature.

Thirdly. Our charge is characterised as *vague*, and it is "simply and entirely denied;" but our opponent also declares his intention of doing it again, and asserts that he promised (!) Mr. Dawson beforehand that he would do it. Our vague charge was—and is—that the editor of the *Photographic News* appropriated, without due acknowledgment, a specified article, the property of the Proprietor of this Journal; that he has acted in a similar manner on some former occasions, with the simple difference that the articles unlawfully abstracted were paid for by money's worth, instead of actual cash. We would not insult Mr. Dawson by even so much as an inquiry whether or no he had consented to the reproduction of his article, much less sought it, as implied by our contemporary—for we know Mr. Dawson to be an honourable man. We presume this charge is sufficiently definite.

Fourthly. We are accused of "eking out our case" by a reference to unacknowledged translations from the foreign journals; and are told to mind our own business in reply. We can well afford to let the foreign journals take care of themselves, and only mentioned the *fact* in order to show the *animus* of our contemporary, and thereby remove the possible plea of "inadvertence" which he makes—for we presume that he will scarcely plead habitual inadvertence. But it so happens that we have the written evidence of the author of at least one paper so treated, with whom we have an engagement still in force, and who would have been committing a breach of his engagement—an act of which we believe him to be incapable—had his assent been accorded to its reproduction without acknowledgment of the source whence obtained. Is this sufficiently definite, or does our contemporary desire any more instances? We can supply them.

As a commentary upon our remarks relative to the injustice of the practice of reproducing without acknowledgment, we may point to two instances illustrative of its effects. The *News*, as we before intimated, appropriated in this way an article from *Cosmos:* this was reproduced in the following number of *Notes*, and credited to the *News*. We regret also to find that the editor of *La Lumière* has, with a few introductory words of his own, translated the article by Dr. Maddox from this Journal, *On Acari in the Nitrate Bath*, without acknowledgment, and the same is reproduced in the following number of *Cosmos*, credited to *La Lumière*. We think we have now shown pretty clearly the immorality of this unfair dealing.

In conclusion, we have to inform our contemporary that, if he do carry out his threat of "doing it again," we shall assuredly tell him of it again, if not take further proceedings. *Verb. sap.*

PHOTOGRAPHIC PRINTING ON ALBUMENISED PAPER.*

By GEORGE DAWSON, M.A.

Lecturer on Photography at King's College, London.

THE *toning* cannot be delayed long after the prints have been removed from the frame. Both processes should be begun and completed in the same day, for they have now been in contact with the varnish of the negative and the pad of the pressure-frame, both of which are conducive to speedy decomposition of the silver compounds on the surface and in the texture of the paper. Let them be well washed, away from daylight, in a vessel under the tap—frequently changing the water, till all trace of milkiness has disappeared. This will take from ten to fifteen minutes. They are now less sensitive to light than before the free nitrate was removed by washing, but still they will not bear with impunity exposure to weak daylight, except for a very limited period. The importance of thorough washing cannot be too strongly insisted on, not merely because it facilitates the toning and prevents mealiness, but because in the after-fixing bath free nitrate of silver is certain to generate sulphuric acid, to the permanent detriment of the pictures. Some writers have recommended a final wash in weak acetate of soda, which experience shows is useful for a carbonate of soda toning bath; others, a weak solution of common salt, which will certainly remove all traces of nitrate by converting it into chloride; but unless the whole, or nearly all, the nitrate has been previously washed away, a thin film of chloride is likely to form on the surface of the print, which will interfere with the regular action of the toning bath. A final washing may therefore be dispensed with, provided the others have been well performed.

For the toning bath many formulæ have been at different times proposed. Having tried all the most promising methods, I am disposed to think several of them may be specially fitted for different kinds of paper, and for obtaining variety of tone. Since the universal cry of mealy prints was raised last summer, arising from the use of alkaline gold, I have always adopted the following formula, and find it answers equally well for thick or thin papers. It seems also to suit better than any other for the Rive and Saxe now in the market. It is not by any means necessary that it should be alkaline; on the contrary, from the small quantity of free acid in the chloride of gold, it will generally be found when recently mixed to have a slightly acid reaction. This is of some importance in preventing the precipitation of metallic gold on the bottom of the containing dish, which usually takes place in an alkaline bath, while, at the same time, it does not prevent, but rather hastens, its deposition on the print. Take

Distilled water	20 oz.
Acetate of soda	200 grains.
Chloride of gold	2 „

Dissolve the acetate of soda first in the water, then add the gold, and set aside the solution for at least an hour before being used.

Not more than six stereoscopic or twelve *carte* prints should be immersed in the above quantity at the same time, and they must be moved about and turned over continually to prevent irregularity of action. It is impossible to state any precise time for the completion of the toning. Much depends on temperature, on the quantity of gold present, and on the quality of the paper. Thin Saxe and Rive, under favourable circumstances, will sometimes be complete in five minutes, but under other conditions may take more than half-an-hour. Thicker papers require longer time. A convenient arrangement to enable the operator to judge of the depth of tone attained is a small contiguous window, with a yellow blind, which may occasionally be removed to admit a stream of daylight. By the light of a taper or gas the different shades of colours cannot readily be distinguished. When the depth seems sufficient—that is to say, a little more than they are intended finally to retain—remove one as a test into the fixing dish of hypo., at the same time stopping the action of the gold on the rest by withdrawing them in a mass from the solution. If in the course of a minute or two the one in the hypo. changes to a tone considerably redder than desirable, allow the other to remain some little time longer in the toning bath. Experience is the best, and I may say the only, guide to determine this point. The danger to be avoided is in carrying the action too far, for it must not be forgotten that they darken considerably in drying. Indeed, beyond a certain point, they lose instead of gaining vigour in the gold, and are certain by prolonged immersion to assume a weak slaty-blue appearance far from pleasing.

The bath, after use, should be bottled up and kept in the dark room. Acetate of soda, being itself generally slightly alkaline, may not only neutralise the free acid of the chloride of gold, but cause absolute alkalinity of the whole solution. This is not of much importance, so far as the toning properties are concerned; but it has a tendency to precipitate after a time on the sides of the bottle some of the gold not appropriated by the last batch of prints. A strong light, high temperature, and exposure to the air, seem also to encourage the same disposition. Care, therefore, should be taken to add on each occasion of use only about as much gold as will tone the prints on hand,—keeping in view the general fact that each full sheet, 23 by 18 inches, requires one grain of gold. With occasional filtering, when necessary, I have used the same bath

* Concluded from page 266.

almost daily for upwards of two months, only adding acetate when more water was required, and gold in proportion to the number and size of the prints. The gold must be added and well mixed *before* the prints are placed in the solution, and if at any time they seem to tone slowly from a deficiency of gold, remove them until more has been supplied.

Fixing.—It is not of much importance to wash the prints again before fixing, unless the toning bath happens to be acid. In which case a thorough washing in ordinary water is necessary to prevent a sulphuretting action in the hypo. Supposing, then, the toning-bath is neutral or alkaline, the prints may at once be thrown into a solution of—

Hyposulphite of soda ..... 6 ounces,
Water ..... 1 pint,

and moved about therein until all the superfluous chloride and other silver salts have been dissolved.

With the above strength of solution, five minutes will be sufficient for thin and ten minutes for thick paper in warm weather. But if the temperature falls near the freezing point it is better to leave them twice that time, inasmuch as chloride of silver quickly enters into combination with hyposulphite of soda at the ordinary summer temperature, but much more slowly in extreme cold. A weaker solution of hypo. than here given is often recommended, sometimes as low as 2 oz. to the pint. I cannot help thinking this is a grave mistake. Weak solutions are undoubtedly a fertile source of *measles*. At all events experiment shows that paper having a predisposition to that disease, and charged with a full proportion of chloride and albuminate of silver, will be found studded with these ugly brown specks of sulphide of silver after having passed through a very weak solution of hypo., whereas a similar piece of paper in a strong solution will remain properly bright and translucent.

Special care must be taken to keep the fixing-bath free from acid, or, which amounts to the same thing, prints imperfectly cleared of free nitrate of silver. If neutral, or, better still, slightly alkaline, it may be used many times—in fact, theoretically, until the hypo. has taken up an equivalent of chloride of silver. But as the paper, besides chloride, contains other silver compounds—such as the albuminate, &c., whose reactions are very little understood and which may exercise an important influence in limiting its fixing properties—it is safer, therefore, not to push it near to that point, and when in doubt to make another. One full sheet for each half ounce of crystallised hypo. of the above strength (always excepting a state of acidity, when, under any circumstances, a sulphuretting action is sure to ensue), will be quite within the limits of safety from measles and other consequences of imperfect fixing.

In *washing* the prints a very common plan is too often adopted of placing a large number in a dish and allowing a stream of water to run through them for several hours, in the hope that they will wash themselves. For reasons which I need not enter into at present this system is fraught with mischief. A very efficacious method, but which entails greater trouble, is to throw them into a large shallow porcelain dish or earthenware pan filled with water—to move them about and separate them for a minute or two till they have all been in contact with the water, and then pour off and drain for two minutes more. Let this be repeated six times. Afterwards they may be allowed to soak for half-an-hour and again drained. In the course of two hours, after draining at the end of each half hour, no test that we can apply will discover the least trace of hypo., so that they may be considered perfectly washed, and hung up or spread out to dry in the usual manner.

"NOTES" HARMONIOUS AND DISCORDANT, ON VARIOUS SUBJECTS.

By J. T. Taylor.

Dried Collodion Processes.

When, in a former communication, I stated that the subject of enlarging was one of the most important of the day, it was by no means intended to assign a place of inferior importance to that of dried collodion plates. The convenience of collodion—as a medium—compared with albumen, starch, and gelatine, will not, I think, be denied; and to the perfection of this film, as regards its sensitiveness and certainty, when used both wet and dry, it is well that all eyes should be turned—all efforts made.

Many suggestive hints, for the attainment of this desideratum, have recently been made, *e.g.* saccharine preparations in combination with gums—tannic and gallic acids—hot development, &c. And how stands the matter at present? Dr. Hill Norris is stated to have solved the problem—the great problem—of a rapid, sure, and efficient dry process; and, so far as I have tried his plates, I think nothing more is wanted than the knowledge of how they are made. Some years ago this gentleman patented a process for the preservation of dry plates, which consisted in coating them with certain gums soluble in water. The collodion film being porous, this varnish served the two-fold purpose of filling up these pores, so as to make them subsequently permeable by a suitable reducing agent, and also acting the part of a varnish proper, by preventing atmospheric and other deleterious influences from acting on the film of iodide of silver. In patenting this process, Dr. Norris showed that he had not attained a due amount of Birmingham wisdom. For, in the first place, and for reasons I cannot at present enter into, I do not think his patent was valid. And secondly, granting that it was, the published specification puts it in the power of every amateur to go and do likewise; and some photographers are not so particular as to attach much importance to the law of *meum* and *tuum*, when it stands between them and a successful result. Dr. Norris has since evidently learnt wisdom; for, having discovered how to manufacture plates of considerably increased sensitiveness, he has wisely kept his own secret. If he does not feel himself in a position to give his process to the world, he has taken a plan which all business men—those to whom "bread and butter" is a consideration—must highly approve, viz., retaining the *how* to himself, and supplying his plates to the public for a consideration. Let us hope he will some day see his way clear to publish his process.

Mr. Sutton, of Jersey, hazards a theory as to the preparation of dried sensitive plates, viz., the quantities of bromides and iodides being present in the collodion in their equivalent proportions. The secret of sensitiveness, he thinks, consists in the presence of iodide of silver *along with* some other sensitive salt of silver. The iodide itself is not sensitive to light, but acts by its presence in exalting the sensitiveness of the other silver salt which is exposed in contact with it, by catalytic action. Now, in the present state of my knowledge, I would be inclined to the opinion that it is the "other salt" of silver that exalts the sensitiveness of the iodide. Iodide of silver, without the addition of chloride, bromide, or fluoride, *is* sensitive, no matter how prepared. In the daguerreotype it is slow without chlorine or bromine, but in the collodion film it is, to some rays at least, nearly as sensitive as in combination. I allude to a sensitised plate carefully washed in distilled water. Still there is a great deal in what he says. Mr. Burnett, in a pamphlet which he published some few years ago, but which is little known—if known at all—in the photographic world, advocates the construction of a sensitive film on similar principles. He lays it down as a principle that there must be "some other" salt of silver present, without being explicit as to any* equivalent combining proportions existing between them; and that may be the turning point after all. I have constructed accurate tables of the equivalents of the various bromides and iodides, which, together with fluorides, will enable me to investigate this question with a certain degree of method, and to report at an early period.

I have alluded to Mr. Burnett. It may not be time wasted to give a brief outline of his sentiments and suggestions on this subject, the more especially as few of the readers of The British Journal of Photography are conversant with them; and, in doing so, I will give much of it in his own language. He lays down some "outside principles" on which his attempts at improving photography are based:—Such as—that our sensitive films must contain at once two different classes of silver compounds; that, while the salt employed to form our sensitising bath must necessarily be a soluble one, it is by no means essential that the salt of the same class, to be left in the films when ready for exposure, should be a soluble one, but, on the contrary, it is on many grounds infinitely better that it should be an insoluble one; that this desired substitution of an insoluble salt for a soluble one, is readily attainable by associating with the iodide the soluble salt of some acid whose compound with silver oxide is an insoluble one, then, after sensitising as usual, washing away the free nitrate and other soluble products. These seem to be the principles on which Mr. Burnett proceeds, and, in carrying them out, he gives a variety of specimen-formulæ which, although possessed of interest, cannot be introduced here. However, some of his remarks *apropos* to the subject more immediately on hand are suggestive, and I quote them *verbatim*:—

"As to the more readily manageable mode of introduction alluded to, we have only to prepare and sensitise as usual, and then transfer our plates, after sensitising and before washing out free silver, to a bath containing a solution in water (or in water with a little alcohol or ether added) of the succinate, oxalate, fumarate,

* This point was suggested long since, by Mr. Heisch, in a paper read before the Blackheath Photographic Society. See this Journal for June 1, 1858, p. 137.—Ed.

phosphate, bezoate, citrate, or tartrate of soda, ammonia or potash (solubility in collodion being here unnecessary), till the silver has been all precipitated, and then washed with plain water (or water containing a very little carbonate of soda, potash, or ammonia, to facilitate the adhesion, or to prevent coagulation of albumen, to be afterwards applied, and, it may be, to increase sensitiveness), and then coat with plain gum arabic or other similar protector, and dry. In collodion, both dry and wet, we should gain immensely by thus securing the presence of a uniform and sufficient quantity of fixed insoluble silver oxide in the film. In dry collodion we facilitate and render much more certain the preparation of the plates, and improve them in other ways."

With regard to chlorides and fluorides, as additions to the iodides, Mr. Burnett has not arrived at any decided conclusion; but he seems to regard them as useful. He gives the equivalents of fluoride (75), and chloride (91) of cadmium, from which one would think he had been trying them in their combining proportions, and, if so, then Mr. Sutton's idea is not new. Mr. Burnett divides his salts into salts of the first and second class, these belonging to the latter, although "chloride of silver plays the part of a salt of the first class towards the silver oxide salts in ordinary printing processes; while in the Daguerreotype and collodion processes it and also the bromide, and in collodion the fluoride also, seems to act occasionally as a salt of the second class. In the Daguerreotype the remarkable sensibility of the film, when produced by iodine alone, would seem to indicate that even the silver iodide was capable of playing both parts at once."

Mr. Burnett has also forestalled Mr. Sutton in regard to the idea of catalytic action. "It may be," says he, "that the iodine vapours may not only themselves have combined with silver, but have catalytically, or otherwise, caused oxygen to combine with it, producing, it may be, an oxy-iodide—a combination or a mixture of oxide and iodide."

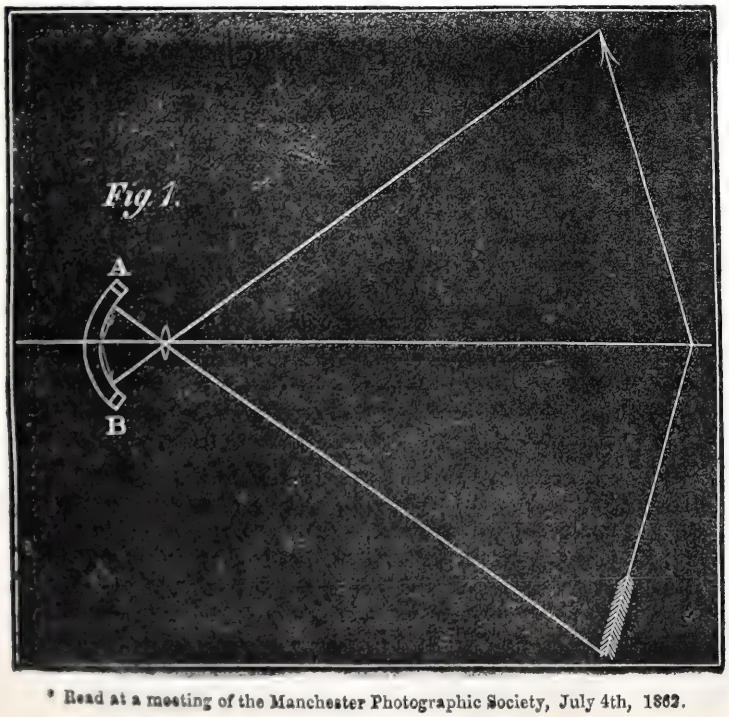
Hoping that there are many earnest labourers in this field beside those gentlemen named, the subject must for the present be allowed to drop.

ON PANORAMIC PHOTOGRAPHY.*

By John Parry.

At our last meeting I undertook to lay before the Society on this occasion the result of some experiments I was then engaged in on the production of Panoramic Pictures taken with the single lens stereoscopic camera. At that time I had satisfied myself that the thing was practicable, but was then engaged in adjusting an instrument I had made for the purpose. After two or three failures with experimental cameras made of wood, I resolved to make all the lower or moveable parts of the instrument of metal, and the results, together with the instrument, I have the pleasure of bringing before the meeting this evening.

The mode of operation I will endeavour to explain by the diagram.



* Read at a meeting of the Manchester Photographic Society, July 4th, 1862.

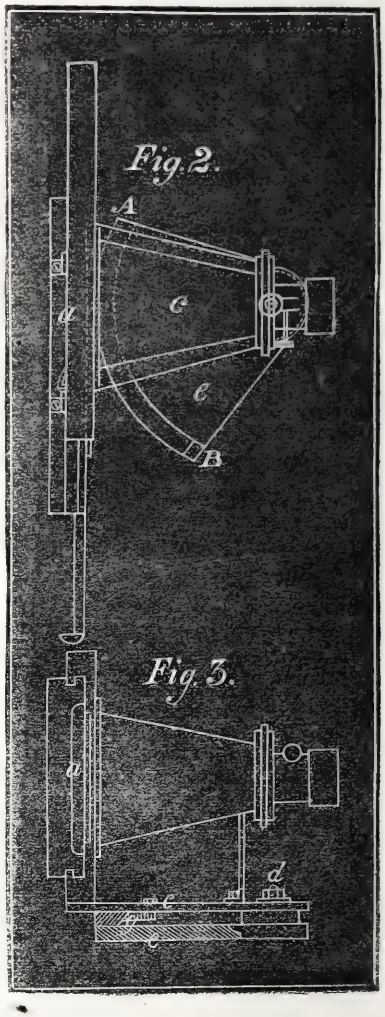
The centre of revolution I place immediately under the lens. The first picture is taken by moving the quadrant to a stop at A, and by uncovering the first portion of the plate in the dark slide. The second picture is taken by bringing the quadrant back to the stop at B, and pressing the dark slide forward until it uncovers the other half of the plate. I need not say that the instrument must be very firmly fixed on its stand; for, if any movement take place but those I have named, the result will prove a failure.

The body of the camera is fixed on quadrants, made of metal, working into each other. The lower one is furnished with stops, A and B, at the ends, which have to be adjusted with great care. It was my intention to have made these adjustments by means of screws; but I found it better to solder on the ends of the lower quadrant two pieces of metal (after trial by marking), and to complete the adjustment with the file.

I find no difficulty in the use of the instrument. It is quite as easily worked as the ordinary single lens stereoscopic camera.

The pictures are a few I took near Bolton Abbey, in Yorkshire. In some of them the joining of the two pictures cannot be traced: in others it shows as a dark line, caused by the back slide being an old one and a little loose.

The angle I use is about 80°, but that will depend on the aperture in the body of the camera and the lens used for the purpose. I have no doubt that the lens I used would cover a much larger angle if the camera were so constructed.



The pictures are well adapted for book-illustration, and also for other purposes; and, when it is known that any one having a single lens stereoscopic camera can easily convert it into a panoramic one, I have no doubt many will do so.

[The accompanying illustrations, *figs.* 2 and 3, represent Mr. Parry's camera in plan view and elevation. The back *a* is that ordinarily used when taking stereoscopic pictures with one lens. This back, and the body of the camera *b*, are mounted upon a brass plate *c*, which turns upon a centre pin *d* placed beneath the lens, and carried by the quadrant *e*, which is supported by the stand. Upon this quadrant are fixed the two stops A B, against which the plate is alternately brought when turned upon the centre pin *d*. The plate *c* carries a rib *g* projecting into a groove formed upon the quadrant *e*, which two parts constitute a guide for preventing the back of the camera from rising.]

PHOTO-MICROGRAPHS.

Produced by W. Russell Sedgfield.

We are pleased to find so able a photographer as Mr. W. Russel Sedgfield making an attempt to introduce amongst the general public a series of photographs of microscopic objects. We learn that in conjunction with his late assistant, Mr. F. G. Eliot, he has opened a photographic printing establishment at Narbiton, where, in addition to the ordinary work carried on in such places, he proposes producing for book illustration photographs of natural objects as seen under the microscope, and others of a like class. We are convinced that this is likely to be a profitable speculation, for the reason that amongst microscopists alone there is a public sufficient to consume a large number of photographs of the class above indicated, in whom there is no need to create a taste for them, because it already exists; and, in addition to those who

already appreciate correct representations of those things which so deeply interest them, there are others who are almost as anxious to make their acquaintance.

A particular description of the specimens before us would be unintelligible to the majority of our readers, but the skilful execution of some of them deserves the highest commendation. Amongst these we may particularly point out the *palate* of one of the *Mollusca* taken with a half-inch, and a valve of the *Arachnoidiscus Ehrenbergii* with a quarter-inch objective, of Smith, Beck, and Beck's cheap form of microscope, in both of which the definition of detail is very fine. With the one-inch object-glass specimens of a more cosmopolitan character have been delineated, such as *transverse sections of different kinds of wood*, the *head and antennæ of a moth*, weapons of offence belonging to some of the dipterous insects, and entire portraits of others not less disagreeable, to say the least—such as the *common bug* and *louse:* perhaps we ought to have wrapped up the mention of such plebeians in scientific nomenclature, and designated them as members of the genera *Cimex* and *Pediculus*. To these may be added that ugly-looking customer the *sheep-tick*.

A very effective photograph is also made of the crystals of ice on a window pane magnified to two diameters.

It will be readily perceived, from the few samples which we have quoted, that there is material provided both for the learned and unlearned. That there are some specimens better than others is a matter of course; but the general character of the whole far exceeds the average of what we have hitherto seen.

ON THE EQUIVALENT FOCUS OF PHOTOGRAPHIC LENSES, AND THE ANGLE OF SUBJECTS INCLUDED.* (INTENSITY AND QUICKNESS.)

By Thomas Grubb, M.R.I.A.

It may not at first sight appear how the intensity and the quickness of action of a lens are matters necessarily connected with the question of what the "lens will cover," but a little consideration will show that, in order to institute a correct examination (comparative or other) of the capabilty of this *covering*, we should be thoroughly acquainted with the principles on which lenses are, or can be, placed under circumstances of equal or equivalent apertures. A question may arise as to whether such equalisation should be made in reference to *quickness of action* or to *angular aperture;* but "quickness" in a photographic lens appears to be held in such importance that I shall assume it to be the basis of the equalisation.

I do not recollect that the subject has been distinctly treated in any photographic journal, while there is occasional evidence of misunderstanding and misapprehension respecting it. As a striking instance of such I would refer to The British Journal of Photography for February 1, 1861, where the triplet lens is stated to be a quicker-acting lens than the orthoscopic (although it has four additional cemented surfaces and a greater thickness of glass), and where it is further stated that the said triplet is quicker-acting than the *single combination* (under equal-sized stops respectively placed), although it has eight additional surfaces, four of which are *uncemented* ones.

I shall not stop here to criticise the reasoning from which conclusions are drawn directly opposed to the well-established results of previous experiments; but as the lenses referred to are precisely those which are likely to be the *subjects of comparison* in trials of what can be "covered," it is important that the means of placing such compounds under circumstances of equality as to aperture shall be fully and clearly understood.

Now, every lens has its quickness of action *pro. tem.* dependent upon two sources—first, the intrinsic intensity of its transmitted pencil; secondly, the angular aperture (or aperture in proportion to the focus) in use. The former of these two sources is evidently non-variable in any lens, the latter variable at pleasure by stops. It would appear from the experiments of Professor Stokes that the first lens in a photographic combination, except it be made of rock crystal, absorbs a larger proportion of the actinic rays than any succeeding lens. But we need not enter into this question here, as one lens at least is in every case in use, and the diminished intensity due to using more than one in a photographic combination, will probably be subject to the same law as that to which light is considered to be, and which is simply shown by the following example:—Suppose the first lens to transmit 9-10ths, then $(\frac{9}{10})^2$ or 81-100ths will be transmitted by two such lenses, and $(\frac{9}{10})^3$ or $\frac{729}{1000}$th represents the intensity after passing through three lenses.

* Continued from page 248.

The loss (inevitable) of intensity by the employment of each succeeding lens in a combination is only to be compensated by the use of an increased angular aperture, whereby there results an inevitable loss of what is termed "depth of focus"—a matter secondary only to quickness in importance to the photographer.

I shall now relate the particulars of an experiment made with considerable care, for the purpose of ascertaining the *relative intensities* of the pencils transmitted by the triplet and single combination.

A ten-by-eight-inch camera was provided with an internal sliding box having a central partition, and so arranged that the No. 3 triplet and the C aplanatic, already mentioned in a former paper, could be focussed upon the same ground-glass, and thus form the means of taking a "bi-lens" stereoscopic picture with these two lenses (dissimilar in all respects but that of focal length). Stereo. pictures were taken of various objects, the exposure being purposely under that which would be likely to yield a good picture. With the latter precaution the results were exceedingly regular. It was immediately found that, by applying stops of equal diameters to the two lenses, the triplet's stop being placed as designed by the maker, the aplanatic was always decidedly quicker-acting than the triplet; secondly, when the triplet was supplied with an inch stop, and the aplanatic with a $\frac{7}{8}$ inch, the aplanatic became the slower-acting; and, finally, when the stop *in front* of the aplanatic was $\frac{1}{8}$ths of an inch diameter, and the stop *inside* the triplet was one inch diameter, the lenses were so equal in quickness, that it was impossible to say which was the quicker-acting.

The stop of the triplet, when placed as last mentioned, *i.e.*, in converging rays, being equivalent to a larger stop placed in parallel rays, to ascertain the equivalent I measured pretty carefully the focus of the triplet's first combination, and the distance from *its* optical centre to the stop. These showed that the stop of 1 inch diameter inside was nearly equal to one of $1\frac{1}{10}$th outside, or, more accurately, 1·08 inches. This gave for the aplanatic and triplet 0·94 and 1·08 inches relatively for the diameters of equalising stops, and these quantities, inverted and squared, give the relative intensities of their pencils, which are just as 75 to 100, or as 3 to 4.

The loss of actinic intensity thus found for the two additional lenses of the triplet agrees very nearly with the probable loss of *light* by the same. Referring to some carefully-conducted experiments on the latter, made in 1857, and in which 2, 4, 6, and 8 plates of thin "crystal" or colourless glass were used, I find that the mean of the results gives $\frac{928}{1000}$ths only transmitted by one such plate, or $\frac{856}{1000}$ths by two plates, and two such plates would evidently transmit more of either light or actinism than two cemented compounds.

The results of the experiments with the triplet and aplanatic lenses may be summed up shortly as under:—

	Triplet.	Aplanatic.
Proportional sizes of stops (*placed as usual*) producing equal quickness	1·	0·94
The same if both stops were placed outside or in parallel rays	1·	0·87
Relative intensities (87^2—100^2)	75 to 100	

And the triplet, if charged with equal-sized stop as the aplanatic of the same focus, is at once a slower-acting lens and one of less depth of focus than the latter—the triplet stops being placed as intended by the maker.

I have not experimented upon the relative intensities of the triplet and orthoscopic lenses. The difference must be slight, but the advantage must, nevertheless, for the reason already stated, be on the side of the orthoscopic lens.

The ordinary portrait combination is generally considered as a very quick-acting lens; but this is due to its capability of being used *for those subjects to which it is peculiarly suited* with a very large angular aperture. When used with only the same angular aperture that the single combination or the triplet will bear, it is a slower-acting lens than the single combination, and that in nearly the same proportion as the triplet.

From these considerations we may perceive the difference between *intensity* and *quickness*—intensity being understood as a quality of the pencil after passing through the lens, unalterable for any lens, and independent of the aperture used; while quickness of action is derived from an intensity of the image, compounded of the brightness of the object and the intensity (great or small) of the pencil and the aperture (angular) of the lens *pro tem.* in use.

While on the subject of intensity and quickness I would seek to remove a misapprehension which my private correspondence with photographers shows to have a very general existence, and which it is very desirable should be removed. It is this, viz., that for

the so-called instantaneous stereoscopic pictures, for the *cartes de visite*, and also for copying, lenses of short foci are desirable, as being *quicker-acting*. Here is an example of one of those many cases where truth and error are so mixed up that it requires some little judgment to separate the one from the other. It is quite true that a short focus lens is quicker-acting than a longer, provided the same aperture be used with both. It is also quite true that a photographer having satisfied himself that a certain description of lens, of a certain focus, will bear a certain aperture and no more when covering a certain sized field, he will be dissatisfied with the result of attempting with a similar lens of twice the focus to cover the same angle of field, using the same angular aperture of the longer focus lens—which alone would give equal quickness of action. All this is of course quite true; but the conditions involved are not the same as those which apply to the case of producing pictures *not differing in size by lenses of differing foci.*

In producing the ordinary stereo. or *carte* pictures, or in copying, the actual size of the field to be covered remains the same whether we use a long or short focus lens, and, therefore, as we increase the focus we reduce the angular extent of the required covering. Now the limit in practice to employing a large angular aperture of the lens lies (with every kind of lens extant) in the lateral pencils, and by increasing the focal length without increasing the actual size of the required picture, we lessen the angular extent which the lens is required to cover; and this, in practice, is found to admit (while retaining equal distinctness for the picture) of increasing the aperture of the lens in use *beyond that which the focus has been increased*, thus constituting the longer focus lens (for such conditions and for such work) *practically a quicker-acting lens.* In every instance which I can recollect, where the photographer has, at my suggestion, tried two foci of lenses for those "instantaneous" pictures, the longer has been retained as best. With these observations I conclude for the present.

Exhibition.

H.R.H. THE PRINCE OF WALES'S TOUR IN THE EAST

Photographically Recorded by FRANCIS BEDFORD.

AT the German Gallery, in New Bond Street, London, there has recently been opened, by Messrs. Day and Son, perhaps the most important photographic exhibition that has hitherto been placed before the public, whether we regard it as an aid to history or as a collection in which unity of design has been a ruling principle in the artist's mind.

Most, if not all, of our readers will remember that Mr. Bedford accompanied, by royal command, the heir to the British throne, during his recent tour in the Holy Land, for the express purpose of bringing away with him records of the principal places visited; and permission has been graciously accorded by Her Majesty both for exhibiting and publishing proofs from the negatives secured.

It is almost a work of supererogation to say that the task has been executed in a highly creditable manner, for those who are acquainted with Mr. Bedford know that he would do it well, or not at all; but only those who are well informed relative to the difficulties under which a photographer labours in a climate such as obtains in the localities in which the subjects before us have been taken, can really appreciate the amount of judgment and skill brought to bear in order to obtain the admirable results arrived at. The photographs are faultless as works of mere manipulative skill—some distortion, arising from the camera having been here and there unavoidably tilted, being excepted. This alone is no slight merit to have achieved, when surrounded by the adverse circumstances encountered; but, in addition, it is to be remembered that, besides being faithful transcripts of the scenes visited, many, not to say most, of these photographs exhibit also a high degree of artistic skill, for which Mr. Bedford is pre-eminently celebrated, and are executed with that exquisite neatness and finish that stamp them unmistakeably with the impress of his own individuality.

Although the present is not quite the first instance in which the works of a single photographer have formed an entire exhibition—Mr. Fenton's Crimean photographs having enjoyed priority in this peculiarity—we may fairly assert that never before has so large, so harmonious, so fine, and so intimately connected *a series* been collected together. We have not forgotten Mr. Fenton's Crimean collection; but those individual specimens were connected but loosely, and, in many cases, scarcely connected at all, the bulk of them being portraits. Neither have we forgotten Mr. Frith's collection, illustrative of localities common to both; but, so far as we are aware, Mr. Frith's pictures were never publicly exhibited as a series, and even when the work was published which contained them, the grave error was committed of not arranging the subjects in any kind of order, topographical or otherwise.

Mr. Bedford's views are remarkably even in execution, and evidently cast in similar moulds—the prominent feature being that of unobtrusive softness, if we may employ such an apparent contradiction as prominence and unobtrusiveness in the same sentence. In a considerable number of the negatives clouds have been skilfully introduced by hand—in others a few judicious touches which rather suggest than define the existence of atmosphere.

We notice one very useful and interesting practice adopted by Mr. Bedford. Most of the negatives have scratched upon them, in an obscure corner, the date when each was taken, which forms a very desirable record, photographically considered, and when examining the several pictures one learns not only where the royal party went, but the precise day on which it might have been found at each of the spots depicted.

Though by far the greater number of the specimens are landscape or architectural subjects, yet a few—and these not the least interesting—figure-subjects are to be met with. Amongst these are a portrait of *Abd-el-Kader* (No. 103); a group of the *Prince of Wales, and several Members of his Suite, at Thebes* (No. 34); a group of *Albanians, Soldiers*, showing the ordinary military dress, at Durazzo (No. 128); and *A Group of Gipsy Oil-Carriers*, belonging to the same locality (No. 129). The two last-named are particularly noteworthy, highly interesting, and picturesque.

Here and there we meet with a specimen or two recalling more familiar scenes, by the same artist—such as No. 126, *Catarro*, a seaport of *Dalmatia*, with the fort, and part of the *Via Dolorosa*, which might well pass for a Welsh scene; or No. 88, *Banias—the Upper Source of the Jordan* and Chapel of St. George, which reminds one of Derbyshire. No. 83, *Kan Minyeh*, the reputed site of ancient Capernaum, exhibits a beautiful bit of light and shade; and so does No. 3, *A Street in the City of Cairo*, though this is perhaps a trifle too deep in the shadow. No. 16, *Philæ, the Outer Court in the Temple of Isis*, is also peculiarly Bedfordian in treatment; as also No. 23, *View through the Great Gateway into the Grand Court of the Temple of Edfou.*

It would be an admirable lesson for those who absurdly contend for the mechanical nature of our art to compare Mr. Bedford's view of the *Hypæthral Temple at Philæ*, generally called *Pharaoh's Bed*, and Mr. Frith's view of the same object taken from nearly the same place—both excellent, but the sentiment and expression entirely different in the two renderings.

At Nabulus an excellent photograph was obtained of the *Ancient Samaritan Pentateuch* (No. 79); while of ruined temples—with their deeply-cut hieroglyphics, telling of deeds of heroes long since passed away—when the veil of mystery is now and again lifted by the learned student of Eastern lore, there are enough to provide materials for much investigation.

No. 49, *Jaffa*, the ancient *Joppa*, recals immediately the Angel's directions to Cornelius to send to Joppa for Simon whose surname is Peter, lodging with one Simon, a tanner, whose house is by the sea-side.

The *Jerusalem* views are of course especially interesting from their associations; but in addition to this they are mostly excellent as mere views. How soft and suggestive, for instance, is No. 52, *A General View of Jerusalem from the Mount of Olives!* Who can look unmoved on No. 63, *The Mount of Olives*, or fail to speculate upon the precise spot where our Saviour used to sit with His disciples? Who, again, can view without emotion the *Garden of Gethsemane*, as shown in Nos. 67 and 68?—or omit to conjecture where Mary stood when she turned at the voice of Our Lord and pronounced the word Rabboni?

Apart from localities named in sacred history, there are others in and about Jerusalem that claim the attention of the visitor. The *Pulpit in the Enclosure of the Mosque of Omar* (No. 58) is an exquisite photographic study; and so also is No. 59, the *Mosque El Aksa.*

There are many excellent illustrations of *Constantinople*, amongst which the *Fountain of the Seraglio* is a particularly pleasing subject.

We have noticed but hastily a few of the most striking examples in this admirable collection. Those who visit it will not be likely to content themselves with a hasty glance; for, after having gone through in order, whenever one looks up to take a general survey, the spectator seems irresistibly drawn first to one side, then to another, to examine more closely this or that striking object.

We have no need to wish the proprietors success. If they cannot command they have certainly deserved it; and we doubt not tnat they will meet with their deserts.

Exhibition Gossip.

THE AWARDS OF THE JURORS.

THE great evil and injustice of the classification must now make itself more widely felt. Looking over the awards of the Jurors, I cannot help thinking of a certain good old friend of mine, who, taking up a picture to which I had somewhat proudly called his attention, lauded it, as the saying goes, to the skies; but, turning to one of the most wretched daubs that ever provoked contempt or laughter, he spoke of it in precisely the same terms, and with exactly the same amount of enthusiasm.

The awards of the photographic Jurors may be in perfect accordance with the way in which such have been distributed by other Jurors in other classes, and their method of recognising merit may also be in perfect harmony with a classification which places such a strangely and widely-varied number of excellencies all under the one head, "Mechanical"—recognising the merit of the artist as of one and the same grade as the merit of such as manufacture his apparatus and materials.

The difficulties in the way of the Jurors in making their awards were serious and complicated. They had to recognise degrees of merit so varied and numerous that to represent them fairly by any possible method of distributing *two* kinds of awards was simply out of the question, while to alter the foolish plan laid down by the dogmatic Commissioners may, for aught I know to the contrary, have been equally impossible. Still, it does seem absurd, when we consider that medals are the highest awards, and that "honourable mention" is the lowest, to find these bestowed indiscriminately for "superior arrangement of head-rests;" for "beauty of action of rolling presses," and "for artistic excellence;" for the "manufacture of photographic albums," and for "great artistic excellence in combined pictures;" for such works as Rejlander's, *Two Ways of Life*, full of widely and readily-recognised intellect and genius, and for "cheap and excellent apparatus." The highest honour these Jurors could have bestowed upon Rejlander, Robinson, Bedford, Wilson, and their brave aspiring peers, would have been to omit their names altogether from the list of awards, asserting in their forthcoming report that they could never award to *an artist*, for works full of poetry, sentiment, and feeling, the same recognition they were compelled to extend to the mechanic for good cabinet work, fancy bookbinding, and commonplace mechanism. This would have been brave, true, and praiseworthy; and we might then have been proud of those who (if the Commissioners are to be believed) were elected by the great body of photographers themselves to protect the art, and to assert its real dignity and capabilities, and not to set the seal of an ignoble acknowledgment to a most degrading, unjust, and ridiculous classification.

After such a lame and comical fashion, the Jurors may have been thoroughly earnest and conscientious in their awards. Far be it from me to assert that they actually were not, although there are certain awards which, when viewed by the light afforded by certain others, hint one of two things on the part of those who ruled them, viz., incompetency or private feeling. A glance over the awards will, I feel sure, make this plain to every impartial judge.

Can it be that I am bilious, morbidly irritable, envious, in want of my dinner, of a discontented nature, or what not, that I cannot for the life of me feel so satisfied and pleased with the awards of these Jurors as others profess to be? I start up with a —— when I see backgrounds, cheap cameras, and Rejlander's glorious pictures altogether under the head of "Honourable Mention!" I could not feel quite hearty in congratulating those whose talents I admire and respect upon the receipt of one of those same medals. I am almost inclined to write mournful notes of condolence to Messrs. Bedford, Robinson, and Wilson, sympathising with them in their misfortune, and proffering my deepest commiseration; and another to O. G. Rejlander, expressing similar feelings, but nevertheless congratulating *him*, inasmuch as he did escape the crowning insult of a medal, and, I have heard, very nearly escaped the lesser indignity called "honourable mention." Heaven save the mark!

These difficulties in the way of awarding medals have been met with before, and many only see one way of putting matters right: the knot they can not untie they would cut, and so do away with such awards altogether. Now, for myself, I do not quite see the force of this. A medal *is* valuable (as I have before urged in these pages)—although its value must always depend upon its rarity, upon the character of those who award it, and upon the standard and class of excellence it is intended to represent. To say that I am the successful one out of fifty able aspirants for certain honours is something to be proud of. To say that I am the victor chosen from a hundred rivals by competent and highly esteemed judges is something of which I may be more proud. But if, in either case, the decision rested with the aforesaid good old friend of mine, however conscientious and honest he might be in awarding me the medal or "mention"—as the case might be—and however proudly I might exhibit the same in my shop-window, show-case, or advertisements, I should be secretly conscious that I had very little to be proud of, and that there was a good deal of humbug and nonsense about the whole affair. From this the reader may glean my opinion about the awards of Jurors in Class XIV.

In the British Department "artistic excellence" is rewarded with a medal in three instances only, the successful competitors being Messrs. Mayall, Robinson, and White; while the same qualities are rewarded by "honourable mention" not less than thirteen times. The names of those so distinguished are Barrable, Brothers, Green, Hering, Hill, Vicountess Jocelyn, Kilburn, Locke, McLean, Melhuish and Haes, *Rejlander*, Ross and Thompson, Lyndon Smith, and Sutton. Mayall, therefore, as an artist—and according to the opinion of the Jurors—is superior to Rejlander! This, in my opinion, is a very funny and original discovery.

It should please us to find medals more sparingly awarded in Class XIV., I think, than in others: they evidently represent merit more rare in character than can be found in less artistic productions. For the same reasons, we should not find fault, *perhaps*, with the larger share of medals carried off by our French rivals. In the English Department, medals have been awarded to about one in six: in the French they have been given to one in four. If this indicates that the English standard of photography (pure) is higher than that of the French productions, well and good; if it indicates anything else, ill and bad.

In these papers I have ventured to claim for our Department the highest artistic ambition, and this seems almost to be admitted in the awards—inasmuch as, while we have "artistic excellence" among "Reasons for the Award" in the British Department given *sixteen* times, in the Foreign Department such a reason is only found in the French *twice* (one medal and one "mention"), and in the others *once*—that solitary exception being claimed for Russia by Wieczkowski, "for good portraiture and artistic effect."

In the British Department—perhaps because the Jurors hoped, by such a step, to mark their sense of the unjust and singularly levelling character of the classification, and separate the higher order of intellectual excellence from the lower, despite the Commissioners—or, perhaps not; but in this department *no medals have been awarded for photographic apparatus.** "Honourable mentions" are liberally bestowed for apparatus, but *no medals*. The aim, if it be such as I have imagined, was good, but the mischief of such a plan lies in the fact that medals for apparatus *were* given in Foreign Departments; and the public will, therefore, imagine that the French and others excel us in the manufacture of apparatus, which is notoriously not the case. Surely the French have not here stolen a march upon the English Jurors.

There are about 400 contributors to Class XIV. from all countries. The number of awards is 232, including both kinds of award—one in five being the average of medallists, and one in three being the average of those who have obtained "honourable mention."

In the awards for apparatus there is much food for dissatisfaction. The value of certain discoveries seems also to have been overlooked. Instantaneous photography has to a large extent received the encouragement it deserves. In short, merit—and demerit in some cases—of almost every kind has been more or less fairly and thoroughly recognised and rewarded. Some of the distinctions implied in the published "reasons" for the awards are rather hard to understand; some of them are more or less out of focus; and some leave you in a state of blissful uncertainty as to where and in what the particular excellence recognised had its being.

But, after all, the awards might have been worse, you know—which is a nice little piece of consolation, seldom inapplicable, and always of a very elastic description. That they might have been better is also more or less true; but in either case let us charitably remember the difficulties which, being neither small nor few, hemmed in the Jurors, and which may have had more to do with the general result than we are yet aware of. It would be well perhaps, before coming to a conclusion, to read that glorious and immortal old fable, called "The Old Man and his Ass." I dare say we shall know all about it by the time the medals have been duly distributed, and the reports of the Jurors duly made public.

I must resume my review of the pictures in my next, as these remarks have already exhausted my supply of space. A. H. W.

* Excepting for lenses, which, of course, take higher rank.

JURORS' AWARDS IN THE PHOTOGRAPHIC DEPARTMENT OF THE INTERNATIONAL EXHIBITION.

NOTE.—The letters *a b c*, attached to some of the names in the succeeding list, indicate the following peculiarities:—
a—Photography applied to science.
b—Photography applied to copying.
c—Photographic *printing* in carbon, enamel, &c.

For Photographic Excellence.

MEDALS.

United Kingdom.	
Amateur Photographic Association.	For general photographic excellence.
Beckley .....b	For a valuable series of photographs of spots on the sun, and for the application of photography to astronomical science.
Bedford, F.	Photographs. For landscapes and interiors of great excellence.
Breese, C. S.	For a series of instantaneous views on glass of clouds, waves, &c.
Colnaghi & Co. .....a	For a valuable series of large photographs of antiquities, copies of cartoons, miniatures, &c.
De la Rue, W.....b	For the application of photography to astronomical science.
Fenton, R.	For great excellence in fruit and flower pieces, and good general photography.
Frith	For views in Egypt taken by himself.
Heath, Vernon	For excellent landscape photography.
James, Col. Sir H., R.E. c	For specimens of photography, photozincography, photopapyrography.
London Stereoscopic Company	For great excellence in photographic views, and especially a series of stereoscopic pictures of Paris.
Mayall, J. E.....	For artistic excellence in photographic productions.
Mudd, J.	For very excellent landscapes produced by the collodio-albumen process.
Negretti & Zambra ...	Beauty and excellence of photographic transparencies, and adaptation of photography to book illustration, &c.
Piper, J. D.	For general excellence in the pictures exhibited, especially in landscape photography.
Pretsch, P. c	For a series of specimens of photographic printing by various means as improved and invented by himself.
Robinson, H. P.	For good photographic manipulation, and great artistic excellence in combined pictures, as well as in *carte de visite* portraits.
Rouch, W. W.	For small photographs taken with his new binocular camera with Hardwich's bromo-iodised collodion.
Sidebotham, J.	For beautiful landscape photography by the collodio-albumen process.
Talbot, W. H. Fox...c	For photographic engravings on copper and steel produced by the action of light alone.
White, H.	For great artistic excellence in landscape photography.
Williams, T. R.	Photographs. For excellence in photographic portraiture, &c.
Wilson, G. W.	For the beauty of his small pictures of clouds, shipping, waves, &c., from nature.
Australia.	
Osborne c	For the photolithographic process invented and patented by himself.
Canada.	
Notman	For excellence in an extensive series of photographs.
India.	
Simpson, Dr.....	For a valuable series of portraits of the native tribes.
Jersey.	
Mullins	For general photographic excellence.
Victoria.	
Daintree.....	For an extensive series of photographs illustrative of the colony.
Haigh.....	For stereoscopic and other views in the colony, excellent in photographic treatment.
Nettleton	For excellence of photographic views in the colony.
Austria.	
Angerer, L.	For general excellence and great definition of the portraits exhibited.
Baden.	
Lorent, Dr.	For a beautiful series of large pictures of great photographic excellence.
Bavaria.	
Albert, T. .....a	For a valuable series of reproductions of pictures and objects of art.
Belgium.	
Fierlants, Ed.	Photographs. For excellence in a series of photographs taken by the albumen process for the government.
France.	
Aguado, Count O.....	Enlarged photographs. For specimens of enlargements from small negatives.
Aguado, Viscount O...	Enlarged photographs. Pictures of shipping, &c., enlarged from small negatives.
Alophe, M.	Photographs. For excellent photographs, especially as regards artistic arrangement.
Baldus, E.	Large photographs. For large views of monuments, views from nature, reproductions, &c.
Bayard and Bertall ...	Photographs. For excellence of photographic pictures.
Bingham, R.....a	Photographs. For excellent reproduction of pictures and other objects of art.
Bisson, Brothers	Photographs. For panoramic views of Mont Blanc, pictures of monuments, &c.
Braun, A.	Photographs. For pictures of natural flowers, views, &c.
Camarsac, Lafon De..c	For photographic reproductions in enamel.
Cammas	Photographs. For large views, on waxed-paper, of Egypt and its monuments.
Davanne and Girard..	Photographs. For pictures of photographic excellence.
Delessert, E.	Large photographs. For large views of monuments in Paris, untouched.
Disdéri	Photographs. For excellency of enlarged and other pictures.
Fargier c	Photographs. For pictures done by the carbon process.
Ferrier	Large photographs on glass. For excellent pictures on glass, instantaneous views in Paris, &c.
Garnier and Salmon..c	For the carbon process invented by them.
Jeanrenaud	Photographs. For excellence of photographic views, &c.
Lyte, Maxwell	Views in the Pyrenees. For excellence of landscapes in the Pyrenees.
Marville.....	Photographs. For photographic pictures of objects of antiquity, landscapes, &c.
Muzet.....	Views of the Isère. For good landscape photography.
Nadar	Photographs. For pictures obtained by the aid of electric light.
Nêgre, C. c	For heliographic pictures on steel.
Nièpce de St. Victor..c	For heliographic engravings on steel, and various specimens by processes described by himself.
Poitevin, A.....c	Carbon photographs. For carbon pictures and photolithographs, &c.
Robert	Photographs. For landscapes and copies of works of art, &c.
Warnod	Photographs. For views of shipping, natural clouds and waves, &c.
Greece.	
Constantin.....	For views in Greece of great excellence.
Italy.	
Alinari, Brothers	For great excellence of photographic productions.
Van Lint, E.....	For excellence of pictures exhibited.
Prussia.	
Oehme, G. & Jamrath	For excellence of photographic productions.
Wothly, J.....	For excellence of large pictures by the process invented by himself.
Rome.	
Cuccioni.....	For general photographic excellence.
Dovizielli, P.....	For general photographic excellence.
Russia.	
Denier	For general photographic excellence.
Saxony.	
Manecke, F.	For excellence of photographs.
Sweden.	
Manerke.....	For excellency of photographs exhibited.

HONOURABLE MENTION.

United Kingdom.	
Barrable, J. G.	For artistic excellence.
Brothers, A.	For artistic excellence, and for a photographic group finished in water colours.
Burnett, C. J. .....b	For experimental researches in photography, as exhibited in the specimens of printing by uranium, platinum, palladium, copper, &c.

Caithness, Earl of.....	For photographic landscape, especially the representation of hoar frost.
Cramb, Brothers	For a series of views in Palestine.
Cundall, Downes and Co. *a*	For photographic reproductions.
Dancer, J. B.....	For microscopic photographs, landscapes, and portraits.
Gordon, R.....	For excellent views in the Isle of Wight.
Green, B. R.	For artistic excellence in coloured photographs.
Hemphill, Dr. W. D...	For excellence of views of antiquities in Ireland
Hennah, T. H.	For photographic portraits.
Hering, H.....	For artistic excellence.
Hill, D. O.....	For great artistic merit in photographs exhibited.
Jocelyn, Viscountess..	For artistic effect in landscape photography.
Kilburn, W. E.....	For artistic excellence in coloured photographs.
Lock and Whitfield...	For artistic excellence in coloured photographs.
Macdonald, Sir A.....	For excellence of photographic landscapes.
Mayland, W.	For good photography in views, &c.
Olley, W. H.....	For photographs from the microscope by the reflecting process.
Ramage, J. .....*c*	For applications of photolithography.
Reeves, A.....	For microscopic photographs.
Rejlander, O. G.	For artistic photographic effect.
Ross and Thompson...	For artistic portraits.
Russell, J. Sedgfield..	For views of the ruins of Chichester cathedral after the fall of the spire. For good stereoscopic views.
Smith, Lyndon	For landscapes. &c., artistically taken.
Smyth and Blanchard	For a series of instantaneous views for the stereoscope.
Sutton, E.	For artistic excellence in coloured photographs.
Thompson, S.	For excellence in architectural photography, &c.
Traer, J. R.	For excellence of photographs of microscopic objects, &c.
Wardley, G.	For excellent landscapes by the collodio-albumen process.
Warner, W. H.....	For photography in a series of enlargements from small negatives.
Wortley-Stuart, Lieut.-Col. A. H. P.	For views of Vesuvius during the eruptions of 1861-2.
Columbia, British.	
Claudet, F.....	For a series of views in New Westminster.
Guiana, British.	
Tucker	For photographic views in the colony.
India.	
Sellon, Capt.....	For a series of views in India.
Jamaica.	
Sellon, Capt.....	For a valuable series of photographs of the fish of the Island.
Melbourne.	
Cox and Lukin	For photographic excellence.
New Brunswick.	
Bowren and Cox	For photographic views, being the earliest taken in this colony.
New Zealand.	
Crombie, J. N.	For views in the colony.
Queensland.	
Challingor, G.	For excellence of photographs.
Wilder, J. W.	For excellence of photographs.
South Australia.	
Hall, Rev.—.....	Ethnological studies of the aborigines.
Tasmania.	
Allport, M.	For interesting pictures exhibited, including stereoscopic and other views.
Victoria.	
Bachelder and O'Neill	For photographs of volunteers, &c.
Charlier	For portraits of the aborigines of the colony.
Davis	For excellence of photographs in Melbourne and Fitzroy.
Johnson	For a collection of photographic views.
Austria.	
Lemann, C.....*a*	For excellent reproductions of objects of art and archæological subjects.
Leth .....*c*	For a new carbon process, and copies of wood engraving accomplished by the same.
Melingo, A.	For general photographic excellence.
Oestermann, C.....	For illustrations of Buda-Pesth, the metropolis of Hungary.
Rupp, W.....*a*	For his valuable application of photography.
Tiedge, T.	For a large collection of photographic pictures of peasantry, costumes, &c., from South Hungary.
Widter, A.....	For general excellence of pictures exhibited.
Bavaria.	
Gypen and Frisch ...	For excellence of pictures exhibited.
Belgium.	
Ghémar, Brothers ...	For general excellence of photography.
Mascré, J. .....*a*	For photographic copies of pictures, &c.
Michiels, J. J.	For general excellence of photographs.
Neyt, A. L.	For excellent specimens of photographic micrography.
Denmark.	
Hansen, G. E.	For excellence of photographs.
Lange, E.	For excellence of photographs.
Striegler, R.	For his portrait of the Princess of Denmark.
France.	
Aleo	For delicacy in landscape photography, &c.
Bérenger, Le Marquis de	For good landscape photography on waxed-paper, &c.
Berthier, P.....*a*	For excellent reproduction of works of art.
Blanc, N.	For good artistic arrangement in portraiture and excellent photography.
Bobin, A.....*a*	Photographic reproductions of maps and plans with great accuracy.
Breton, Madame	For archæological views, &c.
Carjat and Co.	For excellent photographic portraits.
Charnay, D.	For excellence of photographs exhibited.
Charavet .....*c*	For his carbon pictures.
Collard	For excellence of photographic views.
Crémière	For instantaneous pictures of animals, &c.
Dagron, E. .....*a*	For microscopic photography applied to bijouterie.
De Clercq, L.	For excellence of photographs exhibited.
Delondre, P.	For excellent views obtained by the waxed-paper process.
Delton	For instantaneous pictures of animals.
De Champlouis.....	For views in Syria, obtained by his "wet-dry" process, as described by himself.
Gaumé .....*a*	For reproductions of photographic pictures for glass in churches, &c.
Jouet, E.	For landscape photography.
Ken, A.	For good photographic portraiture.
Lackerbauer	For excellence in microscopic photography.
Laffon, J. C.	For studies of still life—photographs on silk.
Lemercier.....*c*	For specimens of photolithography, &c.
Mailand, E.	For excellent photographic landscapes by the waxed-paper process.
Masson	For excellence of photographs exhibited.
Mayer and Pierson ...	For excellent photography.
Michelez, C.....*a*	For reproductions of works of design, ancient and modern, &c.
Moulin, F.	For excellence of photographs exhibited.
Pesme	For excellence of photography.
Potteau	For excellence of photographs exhibited.
Richebourg	For good photography in portraiture and objects of art.
Roman, D.....	For excellence of photographs exhibited.
Silvy	For good photographic pictures.
Tournachon, A., jun...	For instantaneous pictures of horses and other animals.
Villette, E. .....*a*	For large photographic pictures obtained by Dubosq's electric light.
Italy.	
Roncalli, A. .....*a*	For excellence of microscopic reproductions.
Mecklenburg-Schwerin.	
Dethleff	For excellence of pictures exhibited.
Netherlands.	
Eyck, Dr. J. A. van.*a*	For his photographic copies of etchings by Rembrandt, the size of the originals.
Norway.	
Selmer	For a series of pictures of the peasantry of the country.
Persia.	
Pesce, Luigi	Views of Teheran, Persepolis, and other localities in Persia.
Portugal.	
Silveira, J. W.	For excellence of photographs.
Prussia.	
Minutoli, Von.....*a*	For a valuable series of reproductions of objects of art.
Schauer, G.	For excellence of pictures exhibited.
Russia.	
Mieczkowski, J.	For good portraiture and artistic effect.
Rumine, G.....	For a series of views in the East, and general photographic excellence.
Sweden.	
Unna and Höffert.....	For general photographic excellence.
Switzerland.	
Georg.....	For general photographic excellence.
Poncy, F.	For general photographic excellence.
Vuagnat.....	For general photographic excellence.

United States.	
Dexter	For a series of busts of the Governors of States in America.
Würtembürg.	
Sprösser	For photographic excellence.
Zollverein.	
Exhibitor not identified	For excellence of photographic impressions.

For Apparatus and Chemicals.

MEDALS.

United Kingdom.	
Dallmeyer, J. H.	For excellence of lenses, and introduction of a new triplet lens free from distortion, with chemical and visual foci coincident.
Ponting, T. C.	For the excellence of his iodised sensitive collodion.
Ross, T.	For superiority of his photographic lenses.
Austria.	
Dietzler, Ch.	For photographic lenses of excellence.
Ponti, Ch.	For the alethoscope, with the photographs exhibited therein.
Voigtländer and Son	For great excellence of photographic lenses.
France.	
Bertaud	For excellence of lenses.
Bertsch, A.	For excellence of articles exhibited.
Darlot	For excellence of articles exhibited.
Derogy	For an arrangement for altering the focus of a lens.
Dubosq, L. J.	Photographic apparatus. For photographic appliances, lamp, &c.
Duvette and Romanet	Photographs. For excellent architectural views of Amiens cathedral.
Hanse Towns.	
Krüss	For photographic lenses of great excellence.
Prussia.	
Busch, E.	For excellence of lenses and photographic apparatus.
Schering, E.	For chemical products and photographs.

HONOURABLE MENTION.

United Kingdom.	
Austen, W.	For superior arrangement of head-rests, and beauty of action of rolling-press for photographs.
Bland and Co.	For very excellent workmanship and arrangement, especially adapted for India and foreign countries.
Borquin and Co.	For general excellence of articles exhibited, especially for photographic albums, of their own manufacture.
Bull, J. T. and G.	For photographic accessories and backgrounds.
Cox, F. J.	For general excellence of articles exhibited.
Davies, T. S.	For excellent arrangement of his photographic manipulating camera for field purposes.
Hare, G.	For excellence in the manufacture of cameras.
Highley, S.	For excellence of apparatus exhibited.
Hockin and Wilson	For excellence of articles exhibited.
Hopkin and Williams	For excellence of photographic chemicals.
Horne & Thornthwaite	For general excellence in articles exhibited.
McLean, Melhuish & Co.	For general excellence of photographic apparatus, and artistic excellence in coloured photographs.
Meagher, P.	For great excellence and cheapness in the apparatus exhibited.
Moule, J.	For his apparatus for taking portraits by night.
Murray and Heath	For superior arrangement and work in articles exhibited, and especially for usefulness of Smartt's tent.
Ottewill, T., and Co.	For excellence in the manufacture of cameras.
Skaife, T.	For a pistolgraph and a series of productions called pistolgrams.
Solomon, J.	For the introduction of many useful aids to photographic manipulation, as exhibited.
Wright, Dr.	Portable photographic apparatus for field purposes, combining tent, &c., adapted for railway travelling.
France.	
Albites, T.	For excellence of articles exhibited.
Briois, C. A.	For excellence of chemicals used in photography
Garin	For excellence of photographic chemicals.
Hermagis	For excellence of photographic lenses.
Koch	For excellence of articles exhibited.
Lecu, F. N.	For excellence of articles exhibited.
Marion	For excellence of photographic paper.
Millet, A.	For excellence of photographic lenses.
Plessy, M.	For excellence of photographic chemicals.
Puech, L.	For excellence of photographic chemicals.
Quinet, A. M.	For excellence of articles exhibited.
Rolloy, Fils	For excellence of articles exhibited, especially for his photographic varnish.
Frankfort.	
Hamacher	For excellence of articles exhibited.
Prussia.	
Beyrich, F.	For photographic paper.
Kunzmann, H.	For photographic paper.

WHERE TO GO WITH THE CAMERA.

By Our Own Pioneer.

ROUND ABOUT EXETER.

Summer time has now more than arrived: bud, bough, and all the various delicate foldings of Nature's leafage are thoroughly developed and out. The most glorious part of the four seasons is gladdening alike to youth and age. World-workers of the pent-up cities and towns are glad to escape for a few weeks, or even for a few days, and wend their way up and down glens hemmed in with hazel and bright green sward, gaze at the lofty pine, rest beneath the silvery beech, or court the noonday shade afforded by the spreading branches of the gnarled and vigorous oak. Many amateur photographers are now glad and ready to avail themselves of the few spare days at their command to seek fresh subjects for their folios and collections. The best known and important places have to a great extent been worked out and done over and over again. Taking pictures of such is consequently no novelty. On the production of a proof to astonish a friend, it is rather annoying to be met with the remark—"Oh! I have seen that place before. Tom Cyanide was there last year, and took some splendid views." Or—"Oh! I've seen that in shop windows."

All this is unpleasant; added to which, crowded places are high charging places, and that is also unpleasant. I therefore purpose to point out a series of "nooks and corners," and a variety of picturesque spots that have not been overdone, that may be conveniently and easily reached, where the operator will be free from interruption and annoyance, and where clean and homely accommodation is to be met with on fair and reasonable terms. Exeter I again select as a starting point; and, as a popular authoress, the daughter of a celebrated artist, has pronounced Devonshire cottages to be objects equally worthy the attention of poet, painter, or the lover of the romantic, few places can offer such effective samples as the "land of the red earth"—Devon, the garden of England. The best specimens are quickly vanishing. Speculating builders and improving landlords, with the increasing extension of the rail and iron-way, are great destroyers of thatch roofs and cob walls: photographers should, therefore, be on the alert, and secure some few remaining good bits before they are gone for ever. Should the tourist come on by the Bristol and Exeter line he would do well to stop at the Tiverton Road Station, where he will find a comfortable and convenient inn; or at Samford Peverell, on the road to Tiverton. The church, from the banks of the canal is a good subject. A couple of miles further there is another church—Halberton—a fine building of the fourteenth century, restored some years back, principally at the cost of one of the sons of Sir Thomas Ackland. A mile to the left, beyond the church a turn in the road leads to the canal banks, some short distance from Tiverton, with several excellent subjects on the way, backed by the Black Down hills, and an extensive and magnificent view of Taunton Vale. Tiverton (the town of two fords) is celebrated for its grammar-school, church, castle, lace factory, and from having been represented in Parliament for so many years by Lord Palmerston. There are several good inns, and some clean, well-conducted refreshment houses. Blundell's School, founded 1604, is world-famed, well situated for taking, and makes two good pictures. The fine Gothic Church of St. Peter dates from the fifteenth century, is highly ornamented externally and internally, with a decorated south side chapel of the date 1518. The church tower rises to a great height, and from the top presents a fine panoramic view of the surrounding district. Good pictures may also be got from the river banks. The remains of the castle (an old gateway with ivied walls and towers), formerly the abodes of the Earls of Devon, is a fine architectural specimen of the prevailing style of the twelfth century: it stands close to the road on the north side of the town, and will yield three or four good subjects, as will also a new church built within the last few years. The lace factory, Lowman Bridge, Tiverton Bridge, from the river banks, the tower of St. Peter's in the distance—not forgetting Greenway's Almshouse in the high street—are also worth taking. The late John Cross, the talented and successful painter of some of the prize cartoons for the Palace at Westminster, passed much of his time at Tiverton, and painted many of his best pictures there.

Exeter, some thirteen miles from here, can be reached by taking the Bickleigh Road, and passing on through Stoke Cannon and Rewe. At each of these places much that is good and effective may be taken. Or the road from Tiverton to Cullompton may be followed. This place is situated on the River Culme. The Church of St. Andrew has been restored within the last few years: a building of the fifteenth century, with a finely painted and carved screen, and decorated aisle on the south side, built by John Lane, 1528. From the grounds of the vicarage it makes a good picture, with every facility for placing the camera either there or in the

High Street, from which a fine view of the massively-built and highly-decorated tower may be obtained.

Bradninch, a short distance from the Hele Station of the Exeter railway, has a couple of good subjects in the old church and rectory. King Charles was here in 1644, and remained at the latter place for some time. Hele Station, with the paper mills, is a good subject; while across the line, to the right, about three miles, you come to Killerton Park, the seat of Sir Thomas Ackland, but which presents no particularly noteworthy features. Poltimore House, the seat of Lord Poltimore, is close at hand, offering a good distant effect; while the church and old Alms-Houses are very good subjects. Bramford Speke, not far off the road, gives some good bits in old cottages and hedge-row scenes, the church and tower coming in most effectively in the distance. Some few years back it was a familiar name to all readers of the current news of the day, in the celebrated case of Gorham and the Bishop. Exeter is now close at hand, where the tourist can please himself as to remaining, or make his way down Fore Street Hill, and on to the banks of the ship canal, bound for a point called Turf, where the said canal commences, and to which place the Corporation of the "ever faithful city" repair to enjoy themselves—a sort of Greenwich whitebait house, with the advantage of fresher air and fish obtained from purer water. The subjects to be met with will be:—The old turreted tower of Alphington Church, backed by the lofty Haldon Hills; Exminster and station, with a broad expanse of marsh—one of those picturesque buildings, erected on the South Devon line, to carry out the atmospheric plans, and generally known as Brunel's "follies;" Topsham, with its square-towered church rising from a compact mass of houses; if high water, a few small craft at anchor under the town walls—if low, a vessel here and there heeled over on one side, with waggons and horses, &c., &c., and the usual busy scene of loading and unloading.

There is also Powderham Castle and park, the seat of the Courtenays, Earls of Devon—the park, some nine or ten miles in circumference, having extensive wooded glades and magnificent groups of trees and deer. The Castle itself is supposed to date from the time of the conquest. On the line, slightly to the left, we come to Starcross, a place that has within a very brief period risen from mud and mussels into cleanliness and consequence. Close to the station there is another of the "follies" that comes in well, either from the sea-wall or beyond the jetty, taking in the long strip of marsh and sand, called the Warren—the sails and masts of various small craft coming out well in the distance. On the right are Powderham Church and Vicarage, with the Belvidere or Prospect Tower, rising from the wooded heights behind. Looking towards the city, a low long Canalettisort of effect is seen—the Norman Towers of the old Cathedral, dating from 1050, rising in clear relief against the sky. From the solid line of buildings surrounding St. Leonard's and Heavitree, the high ground of Honiton cliff stretching away to the right, the left filled in by St. Thomas's and the neighbourhood—these, with the lights and shadows of a sinking sun, on a clear summer's evening, with a variety of objects and masses reflected and reversed in the clear water of the canal, present a scene which, for beauty and effectiveness, it would be difficult to surpass —reminding one forcibly of the works of Callcott, Callow, and the younger Clint.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on the 4th July last,—Joseph Sidebotham, Esq., in the chair.

The Chairman introduced Mr. Dallmeyer's shutters for short exposures to the meeting, and explained an arrangement of his own, which had been before the Society at a meeting in 1858, and reported at page 289 of the *Liverpool and Manchester Photographic Journal* for that year.

A discussion upon these contrivances followed, and general opinion awarded to Mr. Sidebotham's the first place. As this arrangement has been lost sight of in recent observations on the subject, we will again allude to its principle of construction.

Attached to the front of the lens is a disc, provided with a central aperture. Eccentric to this, and turning upon a centre of motion, is another disc, also provided with an aperture. To one of these discs is connected a coiled spring, which, upon being liberated from a distended condition, causes its disc to revolve rapidly, during which revolution the two apertures become for an instant coincident, and thus effect the exposure. When the spring is distended the disc is held by a catch, so as to close the lens, and its liberation is effected by a slight pressure of the finger, no shaking of the camera taking place until the exposure has been effected.

Mr. Parry then read a paper *On Panoramic Photography*. [See page 286.]

Several panoramic pictures, taken by Mr. Parry, were handed round, affording most abundant proof of the success which has attended that gentleman's perseverance and ingenuity in this almost untrodden path of photography. In some of the specimens the closest inspection of the ordinary observer could not detect the junction of the two pictures; those even in which it could be seen, owing to the defect of the apparatus mentioned by Mr. Parry in his paper, were great successes.

In reply to Mr. Montefiori, Mr. Parry stated that, after the stops of the camera were properly adjusted, they were correct for all pictures. He had to expose a great many plates before the correct positions could be determined; but that once accomplished the camera was always in order.

The Chairman remarked that Mr. Penny caused one picture to overlap the other, but Mr. Parry worked the edges up to each other as closely as possible.

Mr. Wardley said he thought it would be better to let them overlap a little with a soft edge.

Mr. Parry explained that a soft edge necessarily followed, and that he found an overlapping to be injurious.

The Chairman said that he thought the members were greatly indebted to Mr. Parry for the instruction he had afforded them. Pictures produced by the method he had described were not only superior to any which could be obtained by a panoramic lens, but they possessed the merit of involving no additional skill or labour in their production.

A vote of thanks was then presented to Mr. Parry.

The Chairman stated that he had been following up his experiments with the view of producing dry plates as quick as those issued by Dr. Norris, and he had met with results which induced him to believe he should be able, at the next meeting, to announce some success and to describe the process.

A conversation followed on the uses of bromides in dry-plate photography.

Mr. Wardley stated his doubts as to their value; at any rate, he was prepared to say that they were of no use in the collodio-albumen process.

A vote of thanks to the Chairman closed the proceedings.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

Another meeting of this energetic Society was held on Wednesday, the 2nd ult., under the presidency of M. Gabriel.

After the reading and confirmation of the minutes of the previous meeting, the President proceeded to the admission of new members, and to the opening of the correspondence of the month. The following letters were read:—

1. A letter from M. Poitevin, in reply to the congratulatory address sent to him by the committee of management.

2. A letter from M. Devylder, Professor at the Royal Athenæum of Ghent, announcing his intention of opening a class at Ghent for the practical study of photography.

M. Vidal, in thanking M. Devylder for the good-will expressed in his communication, alluded to the desire entertained by the Society that the example set by M. Devylder might be followed in all the great centres of Europe. He availed himself of the present opportunity to remind the members that classes, such as that intended by M. Devylder, would be inaugurated as soon as the *locale* of the Art Union was settled—that is to say, in five or six months.

3. A letter from Messrs. de Jongh and Bargignac, photographers, presenting to the Society two proofs taken by them of the *Chefs Touregs* which had lately passed by Marseilles.

The President delivered these very successful proofs to the members of the Society, and thanked Messrs. de Jongh and Bargignac.

M. Tissot directed the attention of the Society to the interesting experiments which had appeared in the various publications of the month of June, having for their object the perfecting of a dry collodion process, and remarked that the dry processes were becoming more and more generally used to the displacement of the wet collodion process, which had already come to be regarded as rudimentary in its character, and to which recourse would very soon be had only under exceptional circumstances. He described the method adopted by Mr. Baynham Jones for effecting the adherence of the film to the glass in the tannin process, which consisted in adding malt to the solution of tannin with which the plate was covered—a plan, he said, worthy the attention of the numerous amateurs who were daily experimenting in the tannin process. He (M. Tissot) also described several other processes and formulæ with equal precision and clearness.

The President thanked M. Tissot for his active co-operation in the labours of the Society, and asked M. Hudelot to undertake the task of analysing the various photographic publications which would appear prior to the next meeting.

The members generally were then invited to lay before the Society any communications they might have to make.

M. Hudelot exhibited some instantaneous stereoscopic views taken by the aid of M. G. Anthoni's portable laboratory. These animated scenes, illustrating life on the quays of the Port of Marseilles, attracted considerable attention.

M. Vidal showed a positive on glass, bearing evidence of much too long an exposure, which he had obtained by exposing a four-months' prepared tannin plate to an ordinary moderator lamp for about 30 or 40 minutes. He showed another which had been exposed only 15 minutes, in which the detail and intensity were perfect—the conditions being, of course, the same as in the former instance.

The object which M. Vidal had in view in showing these pictures was, not so much to invite attention to any new fact, as to insist on a fact which, in the present condition of the various dry processes, was of great importance, and the manipulation of which had not commanded a due amount of attention. He alluded to the indifference with which light coming from an ordinary candle was regarded in the preparation of dry

plates. He could, however, assure the members that such light was quite sufficient to fog all the plates brought under its influence, and he thought one of the pictures which he then exhibited was a good illustration of his statement. It was, therefore, important to preserve the plates from all contact of the slightest trace of the most feeble light. Finally, M. Vidal thought that, regarding his experiments from a practical point of view, the use of lamp-light would be found very serviceable in printing glass positives.

The Committee appointed to examine the communications of Messrs. Cathala, Mechet, Meynier, and Chazal, having concluded their investigations, submitted their report for the approval of the Society.

M. Jacquemet, Secretary and Reporter to the Committee charged with the examination of the chemically-pure products of M. Cathala, read the report of that Committee. After describing the various experiments by which the purity of these products was established, and after a few practical considerations, the report concludes thus:—

"Where is the advantage in a theoretical or scientific point of view of knowing that ordinary chemicals and those which are perfectly pure have, under certain conditions, given the same results? To the careful and thoughtful operator in his art it is far more important to have at his disposal substances about the purity of which no doubt can exist in his mind, which allow him to conduct the most delicate researches with complete confidence, and which, even in an economical point of view, will enable him to realise a profit which he certainly could not do by other means. We are, therefore, of opinion that the chemically-pure products of M. Cathala are indications of an improvement in the right direction, which should receive every encouragement from our Society."

M. Gilbault read the report of the Committee on the instantaneous shutters of Messrs. Chazal and Meynier. The Committee finding points of merit in both, the report recommended both to the approbation of the Society.

In reference to instantaneous shutters, M. Vidal took occasion to remark that the two kinds now in use were far from perfect, and that there was a better chance of arriving at perfection in this particular if it were possible to construct a shutter opening from the centre to the circumference, in such a way as to constitute a series of continuous diaphragms. He showed by diagrams the necessary imperfection attending those shutters which have been in use up to this time.

Several members gave it as their opinion that the construction of such a series of diaphragms in the form of a shutter would be very difficult.

M. Vidal propounded the idea and put it forth with the conviction that there was no material difficulty which actual genius could not overcome in the domain of the possible.

M. Tissot, in reading the report of the Committee on the micrographic apparatus of Messrs. Desjardin and Mechet, directed attention to the ingenious application of ebonite in the apparatus, and concluded by saying that "these perfect and well-constructed pieces of apparatus have seemed to the Committee adapted to render great service in certain special applications of the photographic art."

All these reports having been approved by the Society, the President ordered that they should be entered in the minute book.

A model of a new pressure-frame was exhibited for examination by M. Sorrel, who received the thanks of the President for his communication.

Before the close of the meeting, Messrs. Hudelot and Tissot laid on the table their *carte-de-visite* portraits.

M. Vidal availed himself of the opportunity thus afforded him of reminding those members who had not yet deposited their portraits of the desirability of doing so before the inauguration of the new place of meeting, where the whole of them would be placed in one frame.

A member proposed the infliction of a fine on those members who did not comply with the requisition previous to the closing of the next meeting.

An amendment was made to the effect that one franc be paid for each day after the 15th August next in which the members failed to comply with the requisition.

This measure being unanimously adopted, the meeting separated.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

Mr. Davis desires to inform his fellow-members that he has obtained the permission of Sir Thomas Wilson, of the Amateur Photographic Association, for the next out-door meeting of the above Society being held in his park and private grounds at Chorlton. A dark room will be at the disposal of such members as may desire to use it.

Use of Sugar, &c., in the Tannin Process.—Mr. Hull said he had been making trials of sugar, honey, &c., which had been recommended for the tannin process, and had found no advantage in them. If sometimes they gave a little gain in sensitiveness it was not sufficient to compensate for the extra trouble and risk. He preferred the tannin process in its simplest form. Other members followed Mr. Hull to the same effect, fully endorsing his conclusions, and adding that plates which contained foreign matter would not be likely to keep so well.—*American Journal of Photography.*

Scraps and Fragments.

The Copyright Bill passed through Committee in the House of Lords on the 15th ult.

Photography and the Fine Arts.—An Exhibition of pictures, statues, and other works of fine art, now opened at Spa, exhibits photographs as belonging to the same high class.

Joke for Photographic Portraitists.—"What is that which you never had until after it was taken from you?" asks *Fun*. The brief reply to this seemingly puzzling query is "Your Portrait."

Spectrum Discoveries.—It is now ascertained that rubidium, an alkaline metal, supposed to have been extremely rare, exists in the ashes of beet-root, tobacco, coffee, tea, and grapes. In fact, this metal is one of the most widely-diffused bodies in nature.—*Athenæum.*

Bromides in Collodion.—Referring to the dispute concerning the value and use of bromides so employed, Mr. Heisch says very pithily:—"I do not consider that the truly *relative sensibility* of two collodions to *light* can be tested if different developers are employed."

Amateur Photographic Association.—In obedience to the wishes of Her Majesty, we understand that H.R.H. the Prince of Wales abstains from accepting the office of President of any society until he has attained his majority, and therefore, for the present, becomes only the Patron of the Amateur Photographic Association.

A Useful Hint.—In a recently-taken card-portrait we were pleased to notice the natural effect obtained by cleverly blending what seemed to us the real with the merely imitative:—A naval officer sitting by the (painted) sea-side resting himself upon a rock looking very like the real thing, although it was only a huge block of coal coated with brown paint.

A New State Officer.—The works of Mr. Bedford go far to prove that another State officer must shortly be created. While Court dignitaries in different countries are defining the duties of the Court photographer, the public at large cannot do better than admire the very admirable memoranda of the latest Royal progress which have been penned by the industry and skill of the artist who took part in it.—*Times.*

Universality of the Carte-de-Visite Portraits.—There was recently, on board the Ramsgate boat an instance illustrative of this. Two families met as strangers, grew intimate in the course of the short journey, and when one family were going ashore at Margate leaving the other to proceed to Ramsgate, perhaps never to meet again, they were seen exchanging cards in order that the members of either family might send the other copies of their *cartes de visite!*

Photographic Reproductions.—Longmans and Co. have just published some interesting reproductions of "leaves in Saxon handwriting on Saint Swithun" executed by the aid of photozincography, accompanied by an essay, by Mr. J. Karle, wherein those who are interested in the early history of this ancient and never-to-be-forgotten saint may read of his life and adventures, and how his memory-preserving tradition of the forty days' rain, with which we are all familiar, came into being.

Astronomical Photographs.—In Class XIII. at the International Exhibition, some very fine specimens of enlarged transparencies, from photographs of the eclipse of 1860, are exhibited by Mr. Warren De la Rue. These have been generously presented—as very valuable aids to education, and very interesting additions to the scientific collection—to the South Kensington Museum, where arrangements will be made for their advantageous exhibition and careful preservation.—*Athenæum.*

Mr. Breese's Transparencies.—"Until the 1st of May, this year," says the *Athenæum*, with a feeling akin to that which induces a certain bird to imagine nothing exists which its sand-blinded eyes do not see, "Mr. Breeze was unknown to photographers: he is now, at one bound, in their foremost rank. His moonlight effects, however produced, are of a very high order of beauty. The legitimacy of his process" (what process?) "may be open to dispute. There can be no question as to the charm of his ordinary work, either in clouds, water, or land: one picture, of a rock landscape, is one of the finest photographs ever produced." A contemporary congratulating himself upon the simple fact of a medal having been awarded to Mr. Breese—which is anything but an astonishing one, considering the charming truth and beauty embodied in these fine productions—somewhat "twistically" recognises in the fact of such an award a "tacit acceptance" of the reality of "the moonlight photographs about which so much cavil has been made." The above quotation from the *Athenæum* will show how far such a conclusion—however true or false—is from public recognition.

ANOTHER HINT.—When a glass positive is of that pale grey feeble kind in which coat, face, and background are too monotonously alike, there is a very simple but effective remedy which all who have once tried will certainly praise. Blacken a piece of glass over the flame of a lamp or candle, and with a small soft brush apply the sooty pigment so obtained to the coat, hair, or whatever else in the picture may need darkening, taking the black over both lights and shadows. When varnished the coat will be a rich black, the face will be improved by contrast, and that which was a feeble, washed-out, unattractive-looking portrait will appear a first-class positive. This simple scheme has been frequently sold as a valuable secret. It is also of service when copying "faded or inferior" photographs.

PHOTOGRAPHY AND THE CIVIL LIST PENSIONS.—The just-published list of pensions, to the amount of £1,200, which have been given between June, 1861, and the same date of the same month in 1862, charged upon the Civil List, shows us the grounds upon which such tangible recognitions of public service are granted. Discoveries and labours by which the public have been greatly served, or the progress of art or science accelerated, are therein given as reasons for such rewards or acknowledgments; and when those who have so obtained our well-deserved gratitude and esteem have passed away without receiving either an adequate reward or sufficiently legitimate recognition, the pensions are awarded to widows or to surviving sons or daughters. Without other comment we simply ask if art, science, and the public have ever received more tangible or more valuable services than those rendered by photography? And if this question be answered in the only way in which it can be truly answered, we ask one other question, and that is: If those to whose discoveries and labours the full value of photography, as a public benefactor, is primarily due, will ever receive from the hands of the government such recognitions or rewards as are here honourably granted to other noble labourers equally, but not more, worthy?

ROYAL VISIT TO THE ARCADE (RYDE).—On Tuesday morning last, by special appointment, Her Royal Highness the Princess Helena and Her Royal Highness the Princess Louise honoured Mr. C. Jabez Hughes, the celebrated photographist, with a sitting, at his studio, in the Arcade, Union-street. Their Royal Highnesses were attended by Major Elphinstone and Lady Caroline Barrington. Their Royal Highnesses were taken singly and together, and the artist was singularly fortunate in catching the very living resemblance of their features, while the tasteful arrangement of the surrounding objects has, in addition to the most correct likeness, given an elegance to the *tout ensemble* which redounds greatly to the credit of the artistic talent of Mr. Hughes. This gentleman has, upon many previous occasions, been honoured with the commands of Her Majesty; having photographed Prince Leopold at Osborne, and also by the express commands of the Queen taken a variety of views of the interior and exterior of Whippingham Church. On the previous day the Countess of Desart and Colonel Biddulph favoured Mr. Hughes with a sitting. We congratulate Ryde upon the accession of such a talented successor to our late friend and gifted townsman, Mr. Lacy, as the gentleman who now occupies his studio. It would scarcely be doing justice to the taste and liberality of Mr. Hughes if we did not, in concluding, mention the finished manner in which the whole of his establishment has been fitted up: the antique furniture, the richly falling draperies, indeed everything requisite for the *sanctum* of a *virtuoso*, has been gathered together in the lofty and beautiful studio of Mr. Hughes.—*Isle of Wight Times.*

CEMENT FOR PHOTOGRAPHIC DISHES, &C.—Take one ounce of isinglass, such as is used for clearing wines, that is to say, of the best quality, and steep it in rain water until it is thoroughly expanded; after this point has been arrived at, the water is poured off, and then a sufficient quantity of alcohol is added so as just to cover the isinglass, which, by the application of a gentle warmth, is by degrees dissolved. In another vessel take three ounces of alcohol, and, by a similar application of heat, dissolve therein one ounce of powdered gum mastic. The two solutions are mixed together, and to these add one ounce of gum ammoniac already reduced into small particles either by the knife or the mortar. By heat and frequent shaking this gum also dissolves. The solution or mixture is then evaporated to the consistency of ordinary glue which is used for veneering or similar purposes. It is then poured into small bottles for future use. When about to use this cement, the bottle containing it is placed in warm water, or on a thin layer of wood or cardboard on the stove, by which means the cement becomes fluid. The fractured surface, if not thoroughly clean, must be well washed first with soap and water and afterwards with alcohol, but if the vessel has been newly broken it is not necessary to take this precaution. The edges of the broken parts are next warmed, and then the glue is applied. The pieces are now brought into apposition and kept there until the glue is thoroughly concreted, which will take place in a few days. All the articles used in this cement have to be the purest and best of their kind in order to succeed in its preparation satisfactorily; but it can certainly be relied upon when so prepared.—*Humphrey's Journal.*

PHOTOGRAPHY AND THE VOLUNTEERS.—The *Daily Telegraph* describes how, at a review of the City of London Rifle Brigade by His Royal Highness the Duke of Cambridge, when the gentlemen volunteers had been very highly complimented, and His Royal Highness was about to leave the square, Colonel Warde introduced to him Sergeant D. Combe, of N Company, a photographic artist, who offered for his acceptance a photographic album, bound in green and gold, containing admirably-executed photographs of Lieutenant-Colonel Warde, the late Lieutenant-Colonel Montague Hicks; the Honorary Chaplain, the Rev. Thomas Dale, M.A., Canon of St. Paul's; Drs. Attkins, May, and Prophert; Captains and Adjutants Ewens and Smith; Sergeants Major Southgate and Talbot; Musketry Instructor Grainge; the captain, lieutenant, ensign, and one sergeant, one corporal, and one private of each of the sixteen companies forming the brigade; and a group of the cadets. The album bore the following dedication:—"To His Royal Highness the Duke of Cambridge, K.G., G.C.M., G.G.C., H.K.P., General Commanding-in-Chief, Colonel of the London Rifle Volunteer Brigade, these photographs of the officers, staff, non-commissioned officers, and some of the privates of the London Rifle Volunteer Brigade, are, by gracious permission, most respectfully dedicated by the artist, by His Royal Highness's most obedient servant, D. COMBE, Sergeant of N Company." His Royal Highness took the book up on his saddle-bow, examined the photographs, expressed his admiration of their execution, and, having graciously accepted the gift, thanked Sergeant Combe for his appropriate present. This may perhaps serve as a hint to other enterprising photographers, who are also members of rifle brigades which have colonels of high rank and social importance.

Entremets.

PHOTOGRAPHY AT THE ROYAL DRAMATIC COLLEGE FETE.

THE gorgeously-attired herald having, with sound of trumpet and solemn proclamation, duly opened the fair, its fun, frolic, and noise immediately burst into being. Photography came out strong on the occasion. There were *cartes de visite* of every imaginable shade of merit, vended with smiles of sweetness and words of great temptation, by their fair originals; some of which *cartes* were increased in value from the low sum of eighteen pence to that of half a guinea, simply by the addition of a lady's autograph—so beautiful must be the penmanship of these fair daughters of the stage! Then there was a lecture—a "*powerful*" lecture—on photography, by Professor Toole, T.R.A.; and there was a photographic establishment conducted by little Toole and by big Bedford—the former, as photographer, taking upon himself the reception and *exposure*, and the latter as *developer*, illustrating in his own person a remarkable instance of his powers in this department. To crown all, there was the first introduction of "a new, novel, and original" photographic process, which, being "patent," was not made public, and which would turn out fifty *cartes* per minute! The inventor of this "wonderful invention" was an unaccountably hairy countenanced Count, who, on account of his countless scientific discoveries was of great account in his own country (Russia), and who recounted for our edification how he derived the first hints suggestive of this singular discovery from these identical pages, which it appears are in high repute in Russia!

This great artist in hair and general effect was of a very singular appearance, as great geniuses frequently are. Knowing that gun-cotton was intended to supersede the use of gunpowder in war, he saw no reason why the latter should not take the place of the former in photography; and, as a creamy film was very desirable in the preparation of the plate, what could be better for such a purpose than *cream itself!!* From such simple facts—strangely overlooked in our country—arose this marvellous discovery, which Messrs. Toole and Bedford have now so widely advertised as the "gunpowder and cold cream process," and which was so successfully practised by them at the Crystal Palace on the 19th and 21st ult. *Cartes* produced by this admirable, simple, and efficient process are to be termed "Toole and Bedford's new, novel, and original photographic *carte blanche*."

Another astounding photographic wonder was exhibited by the Russian Count aforesaid, who appeared to be of Yankee origin (for this occasion only). This was a wonderful piece of apparatus,

worked by steam, which, through the agency of "bottled sunshine," produced portraits at the rate of—we are almost afraid to say how many thousands per hour. By merely placing "*a written description*" in a funnel attached to the apparatus, and turning on the steam, it immediately turned out a most faithful photographic portrait of the individual described. The Russian Count, we believe, was indebted for the original idea of this ingenious instrument to a certain advertisement of a similar apparatus still appearing daily in the *Telegraph* and other of our contemporaries; and this idea, it was stated, was worked out by the joint labours of himself and Lord Palmerston. Some one said that the Russian Yankee Count was C. J. Smith, of the Adelphi Theatre, an amateur photographer.

In photographing from the life, Mr. Toole has already won high honours; but, though we have no wish to convert Mr. Bedford into a "hot developer," we must say, without irony, that, as a developer, he was rather slow. Still old developers cannot be expected to exhibit the same activity as young ones do; and Mr. Bedford has now devoted so many years of his life to the development of mirth and harmless fun on the stage, and to the development of that quality which, the old proverb informs us, invariably springs from laughter, that he must be, as the saying goes, "no chicken:" and so bravo "developer" too!

The most satisfactory event in connexion with photography at the Royal Dramatic College Fete was that of its success in bringing grist to a mill which makes the bread of those who "strut and fret their hour upon the stage, and then are heard no more." All honour to the labourers in such a cause, and great success to the cause itself, will be sentiments as gladly echoed by photographers as by any other section of the community.

The "Powerful" Lecture on Photography.

By Professor Toole, T.R.A.

"Come, now, let us have a little nonsense."—*Sydney Smith.*

Professor Toole's photographic establishment, with its attractive announcements and large display of photographic portraits, was situated on the right hand in the north nave from the centre transept. The lecture commenced at about 2 p.m., to an audience composed of between fifty and sixty individuals, and was as follows:—

"Ladies and Gentleman,—Permit me to say that this (the apparatus in question) is the invention of a Russian nobleman, whom I shall have the honour of introducing to you in a few minutes, and I may say that it has been the sole object of his life to see this apparatus brought to perfection; and such indeed is the perfection to which it has been brought, that, after you have given me your attention for a few minutes, I guarantee to all a perfect likeness." Then, turning to the doorkeepers, the learned Professor called out that "there was room for six more," explaining to the company "that it was necessary to get the full complement, or the pictures would be spoilt." The six more having arrived Mr. Bedford proceeded to place the ladies in the front, for "the better effect of the picture," and Mr. Toole then proceeded:—"Now, ladies and gentleman, allow me to focus you (laughter): quite still for one moment, if you please—thank you, thank you, ladies, that will do very nicely." The plate being brought out by Mr. Paul Bedford, Mr. Toole requested the company again to keep quite still, "only for two seconds, if you please, ladies," whereat a lady laughed: he therefore informed her that if she laughed it would cause him "to go through the whole operation again." He then explained to the company how this lens and camera had the very great advantage of taking "round the corners" (laughter), and repeated the operation again, requesting the ladies to be "perfectly still," to "look" as amiable as angels, and be as still as statues. Mr. Bedford next raised the cloth, while Mr. Toole anxiously examined his watch, till at his (Mr. Toole's) sign the cloth again dropped over the lens, and the operation was complete. Mr. Bedford then informed the company that "they might laugh and talk," while he disappeared with the plate into the developing room.

The able lecturer then resumed, saying—"Now, ladies and gentleman, while Mr. Bedford is developing the plate (and I may say that developing, in connexion with plates, has been a particular study of his for the greater part of his life) I will explain the process. This, as I said before, is the invention—the marvellous invention—of a Russian nobleman, Count Sarakowitchemof" (the count was here duly introduced as a venerable gentleman, with a profusion of hair all over his head and face, decorated very liberally with orders and medals, and in a very singular costume trimmed with fur.) "As I said before, it has been the *sole* object of his life to see this invention brought to perfection, which you will not doubt when I inform you that he travelled all the way from Russia *on foot*, in consequence of which feat he felt very much fatigued. But to the process.

"The double oxide of potassium or cadmium (which ever you like) is a vegetable substance, obtained from mustard-and-cress seed, grown in a warm situation on a blacking bottle (laughter), constantly kept damp with paragoric elixer. In three days it forms into a small leaf, which must be subjected to the gas evolving the decomposition of the felocusinsicumdecorriswesublimate. If carried further, it becomes a crystallised substance, in the form of a white powder, known as the Epsom salts of commerce. (Laughter.)

"I must next explain a fact with which you are all doubtless familiar. If you take a small glass plate, and hold it before the kitchen fire till it becomes so hot that you must drop it, and then look hard at it for about two seconds, your likeness will become perfectly impressed upon it. (Laughter.) You must then have ready a solution composed of equal portions of gunpowder and cold cream. (Roars of laughter). With this mix a spoonful of Germanfluis. The Russians generally prefer klatucum, to which the nobleman present has a very decided aversion" (the nobleman present here expressed this aversion very energetically); "or you may use, instead of this, a few carefully-fried postage stamps, as scraps *secretum*. (Roars of laughter.) Into this mixture you dip the plate, and let it remain therein until the photograph is done, when you are done too, and the picture is ready for a beautiful blue and gold frame—and, to use the sublime words of the poet Byron, 'There you are!'"

Mr. Toole was then interrupted by the advent of the well-developed developer, with the developed portraits securely enveloped in envelopes ready for delivery. While these were being distributed, the elegant photographer and lecturer informed his patrons that the autograph of both Mr. Bedford and himself would be found on the back of each portrait, and also informed them that "should any individual lady or gentleman present not approve of their portrait they could instantly convert it into the portrait of 'any other man' or woman by presenting it to them." Upon taking out our portrait, we saw printed on the back of the frame, in large letters, "taken in," and turning it round to look at the likeness we saw our own face most faithfully represented *in the natural colours*, and in a little bit of elaborately ornamented looking-glass! Again: looking at the back of the picture we found, under the large letters of "TAKEN IN," "The Crystal Palace" in very much smaller type.

"LORD DUNDREARY" AT THE INTERNATIONAL EXHIBITION.

Scene—The Photographic Garret, South Kensington.

The Lord Dundreary *loquitur.*

Well, I've got up here: only sneezed twenty-one times, and one sup-sup-pressed. What's all this photo-tographic——? Can't say that again: no time to sneeze in the middle of it. I learnt the Greek lingo at Eton, and s'pose it means to write about one's phoes. That's not bad! Why one should write about one's foes I can't tell. I wouldn't. One should pray for them, I've heard. Don't think some Fowke did though: sent them up stairs instead. Not bad! The why they sent 'em up stairs I can't tell. I shan't come again, I know!—that's flat. No, not flat: it's up stairs. Let's see. Coll-coll-odion: can't say that again, for the life of me. Here's gelatine. Jelly tin! yes, that's it. My brother's wife says jelly moulds are made of tin. That's not bad! But tannin—what's that? One man calls it tanning: is that right? He is from Manchester, and must know if it isn't. I'd tan him, if I had him; but I haven't. Tanning with alcohol: that's Hollands, isn't it? I like Hollands, but tannin isn't sugar; and I like sugar. Aunt Sally—no, she's not my aunt: never mind—says I was born with a sugar spoon in my mouth. Was I? Hot developers! Why not hot? I like Hollands hot. Wouldn't currie do? currie is hot. No: try cyanide. That's it—hide: yes, they tan hides, don't they? Ha! ha! One mustn't laugh at one's own joke—must we? Don't you? Oh! here's a cam-amera! What's in it? Let's see. [Gets into the photographic closet, and—is shut up.]

R. A. S.

Notes of the Month.

In the photographic world, the two principal events of the past month have decidedly been the award of medals and certificates of honourable mention, and the opening of the Exhibition at the German Gallery of Mr. Francis Bedford's photographs, taken during his tour in the East with His Royal Highness the Prince of Wales.

Of the first-named ceremonial the daily press has furnished the fullest details. Class XIV.—in the absence of Baron Gros, as Chairman, and Lord Henry Lennox, as Vice-Chairman—was headed in the procession by Dr. Diamond, M.D., F.S.A., Secretary of the Photographic Society, in the scarlet robes of a doctor of medicine. The noble stature of the worthy doctor in this imposing costume led to many erroneous guesses as to his identity; and one old lady, officiating as *chaperone* to a number of "country cousins," affecting a more extensive knowledge of the upper ten thousand than her compeers, was heard to point out "that tall gentleman in the scarlet robes" as the Duke of Devonshire in the dress in which he had just been installed as Chancellor of the University of Cambridge!

Ancient as the custom is, the propriety of giving medals is very questionable. Queen Elizabeth never permitted her subjects to accept foreign ones, always preferring, as she quaintly expressed herself, "to bell her own sheep." The *Saturday Review* has some pertinent remarks on the subject of giving medals at all, and contends that the principle at best is a very doubtful one, as the medals so seldom go to those who have earned them. We cannot forbear one quotation—"Painters and sculptors are excluded from medals: art is its own exceeding great reward, we suppose. It is only the tradesman or manufacturer who cares for the copper medal, and he can only value it for its advertising capabilities. If there is anything to be rewarded, we should say it ought to be the head-work, not the mere possession of capital and the power of paying wages and keeping a shop. The designer of a first-rate sideboard, or shawl, or ribbon, deserves a prize for a very intelligible reason; but we cannot understand why the manufacturer, who simply owns the machinery which produces them, or who keeps the shop where the lace is sold, is to be medalled. Nor are the Jurors consistent even in following their own principle, and their inconsistency comes out in various ways. There are many objects in which the designer is everything, and which are, in fact, works of art. Some Jurors seem to have seen this, and have given medals to the artists only: others not so. In one case the smith who executed the work got it! There are other and more serious faults to be found with the awards. Again: why should the artists who have executed monumental effigies be included, and the sculptors of ideal statues be excluded? It may be said that the former is furniture, and the latter high art. But where can this line between decorative manufacture and art be drawn, or ought it to be drawn at all? Was not one object of this very Exhibition to show that art—even the highest art—was to be wedded to manufacture? It comes to this:—Raffaelle and Michael Angelo are artists, and are, therefore, above being medalled; but, as to Cellini and Palissy and Della Robbia, they are mere tradesmen and manufacturers, and we will give them a medal, because they are artisans and not artists. Our opinion is, that this distinction between art in pictures and statues and art in manufactures, is treason to art. These inconsistencies come out most emphatically in some departments. An old and long established concern, a Staffordshire pottery, is for sale. Some capitalist—say a London Alderman—whose only knowledge of pastes, glazes, and lustres, is the paste of a pie, the glazing of a ham, and the lustres which hang over a Mansion House dinner table—purchases it. He buys the whole concern—the old patterns, the traditional methods and secrets, and the skill and artists attached to the works—and he exhibits some beautiful productions at Brompton, but nobody knows or cares about the humble artist who has done the work. The medal goes to the enterprising capitalist, who, had it suited his purpose, was just as likely to have invested in a promising bone-boiling concern!" One class of Jurors has very properly given medals to Messrs. Armstead, Vechte, Willms, and others,—the artists of Messrs. Hunt and Roskell, Elkington, &c.

The Jurors of Class XIV. have not altogether escaped rendering themselves amenable to one of these charges, in bestowing the medal for the best series of instantaneous street views ever executed—the Paris views, by Mr. W. England—upon the London Stereoscopic Company, who have not the remotest claim to any share of the merit due, either photographic or manufacturing.

Doubtless, notwithstanding all that has been said, medals will continue to be popular; but too much care cannot be taken in the awarding, or base coin may be made to pass current, borrowed plumes worn, and even the ancient fable about a certain animal in a lion's skin re-enacted.

At any rate, the Commissioners secured a very fine day in a year that has hitherto been little less unpropitious than 1860, the which was humourously accounted for by Mr. C. T. Smith, at the Dramatic College Fete, gravely stating that he had contracted for all the sunshine, and the only remedy was to have your portrait taken at his establishment.

Of the second event (the Exhibition at the German Gallery), it would be but feeble "Dundreary" sort of praise to say that Mr. Bedford has added another laurel to his already well-earned chaplet of fame. To every photographer we say—"Go and see the spoil of this peaceful crusade! See how far good photography can go—how far qualities not essentially photographic can make themselves felt in photographs." The reviewer in *The Times* has gone "straight as the crow flies" to their *distinctive* excellence:—"Mr. Bedford has not only solved the difficult problem of obtaining the half-tone, but succeeded in rendering the carving and raised hieroglyphics in the shade of the interior of a building. * * * * That disappointing paleness which disfigures many photographs seems, in this instance, to have been altogether avoided."

Mr. Bedford had the honour of submitting the proofs to Her Majesty at Osborne, on the 18th ult. The Prince of Wales and four members of his suite who accompanied him on the tour—Dr. Stanley, the Hon. Robert Meade, Major Teesdale, and Capt. Grey—paid an early visit on the day of the private view, and were received by Mr. Bedford before the visitors arrived. The Prince manifested the most lively interest, and expressed his entire satisfaction in the display. David Roberts—whose opinion is worth something—has expressed himself warmly upon the artistic merits of this interesting series. Probably it is to the enlightened policy pursued by the late Prince Consort that we owe them. When some future Macaulay shall write the life of Albert Edward the First they will have an historical interest also.

S. T.

HOW THE MATTER STANDS.

A Dialogue between Mr. British Journal of Photography and *Mrs. Photographic News.*

Mr. British Journal: I regret to find, *Mrs. News*, that you persist in stealing my property. Why, you are worse than our American and Jersey contemporaries.

Mrs. News: Well, I'm sure! Steal!! What did I ever steal of yours I should like to know, that I had not a perfect right to appropriate? Besides, I never appropriated anything—leastways, very little; and, as to stealing! well, I'm sure—ha! ha!—why, I never heard that you'd got anything *worth* stealing. [Here *Mrs. News* sneers at Mr. British Journal's Grandparents, parents, and general antecedents, as is usual with certain irritated old ladies.] Stealing, indeed!—ah, ah! oh, oh! How about the stealing of the title of another journal?—ha! ha! You'r only angry because I called you a Liverpool Journal! Liverpool Journal!! Liverpool Journal!!! and you *are* a Liverpool Journal!!!! You know you are! he! he! he! Stealing! Why, I wouldn't condescend to speak to you, you nasty, inferior, abusive, underhand, lying, Ishmael thing you! I wouldn't if it wasn't that I think I'd better do it. Stealing, indeed! I'll let you to know, Mr. British Journal, that you always was a nasty, abusive, quarrelsome thing; instead of being like me, a nice, quiet, orderly person, as I always am. You know I am. Ask Mr. Pouncy, and Mr. Cramb, and Mr. Rothwell, and ever so many more; to say nothing of the Parent, the Glasgow Societies, and one or two others. I'm too much of a lady to talk to the likes of you; so hold your tongue, you nasty, scandalising thing you! But *you'll get what you deserve*—see if you don't, now, you insane fellow! And you'll call me a "*weakly* contemporary," will you, as you have done ever and ever so many times?

Mr. British Journal: The joke appeared only once in the letter of a correspondent.

Mrs. News: Now don't you try to stop me—don't!—you *Liverpool* Journal, you! Remember I'm a *London* Journal, sir, and treat me with respect as your superior. I say you called me a "*weakly* contemporary" ever so many times; you are *always* insulting *me*—you know you are. But its only because you're a jealous contemporary—a *Liverpool* contemporary—a *Liverpool* Journal, ha! ha! ha! How do you like that now? he! he! he! *Weakly* contemporary. Vastly funny, is'nt it? *Weakly* contemporary! Stealing from you! Yes, indeed. Oh! yes, very likely. What do I care what you are? You may be the King of the Cannibal Islands for aught I care: you may indeed! How about the hiding Sutton gave you? Did'nt I chuckle at his doing what I wished to be doing—he! he! he! How about not letting me have the papers from the North? How about the American complaint? How about the papers at the Parent Society? How about the man in the moon, Timbuctoo—or any other man?

Mrs. News here laughs hysterically, shakes her fist in the face of Mr. British Journal, and weeps as she pathetically winds up with—

She's sure she never did anybody any harm, and she wishes everybody would leave her alone.

[We insert the above sketch from the pen of an occasional contributor, simply because it so humourously embodies the singular combination of spite and egotism with which our contemporary, the *News*, replies to the just but damaging accusation contained in our last.—Ed.]

Foreign Correspondence.

Paris, July 26th, 1862.

The application of photography to wood engraving has been the object of repeated experiments, but hitherto nothing very practical has been arrived at. Here is another artist, M. Baroux, who thinks he has solved the problem. His pictures have for their first advantage that of not being inverted. They are clear, and the contrasts between the lights and the shades is distinct. The wood is not attacked by the preparations it undergoes; and in case the picture is not successful, it can be easily wiped out with a wet cloth. The wooden blocks keep their hardness and polish after the preparation, so as to allow of *clichés* being taken by impression after the engraving has been finished. The photogenic layer is sufficiently thin for the graver to do its work with facility. The image may even be retouched before engraving, either with a pencil or with Indian ink. This is all I know on the subject, the process that M. Baroux employs being kept a secret.

I have just seen two collections of photographic pictures, which the recently-organised *Comptior Internationel des Photographes* is about to make known in France, and which seem to me destined to be very successful. One is by M. Albert, of Munich: it is the reproduction of Kaulbach's cartoons, representing the principal scenes from Shakespeare. I think the immortal poet has never been better translated, and this time the translation will be understood by every one. There is especially one page which is admirable: it is the *Death of Cæsar.* This composition will strike the attention of the French public all the more, as one of our good painters, Gérome, has lately treated the same subject. It must be admitted that his inspiration is inferior to that of the celebrated German artist.

The other collection consists of reproductions of the principal works of modern German paintings. It is executed in three sizes—full-plate, half-plate, and *carte de visite;* so that it will soon become popular. It is by M. Gustavus Schauer, of Berlin. It is to be hoped that the same establishment will shortly introduce the productions of English photographers, which are not yet so well known in France as they deserve to be.

M. Leon Vidal is organising, at Marseilles, a large enterprise, which offers important advantages to photography. He is endeavouring to bring together under the title of *Union des Arts,* all the Societies at present existing at Marseilles, and at the same time to create such others as may be necessary. The object of the founder is to aid, by all available means, the development of the artistic feeling and the encouragement of intellectual labours, and to group round a common centre everything tending to that end. This plan he has explained in a *brochure,* which I have received. It is too extensive for me to do more than indicate here; but I may add that photography has a privileged place in M. Vidal's projects. He has established a photographic laboratory on the premises of the *Union des Arts,* which is intended not only for the reproduction of the remarkable works admitted to the permanent exhibition which will be opened and kept up by the Society, and to which photography will of course be admitted, but also to furnish adepts in the new art with the means which they often lack. Placed under the auspices of the Photographic Society of Marseilles, the laboratory will be directed by a skilful operator. All the operations which constitute the material phase of the art will be there executed: cleaning of lenses, preparation of combined or mixed productions, and of sensitised papers and glasses, development of negatives, printing and fixing of pictures, amplifications, &c., &c. Practical lectures on photography, illustrated by manipulations, will be delivered regularly. Nothing, in a word, will be neglected in order that this special establishment may be as complete as possible, and that photography may derive from it the most serious advantages.

I hear that Dr. Schnauss, of Jena, has just found a new and very simple method for dry operations. For certainty of result, rapidity of execution and perfection, it is said to surpass all those which have preceded it. Although Dr. Schnauss has not yet published anything on the subject, we are too well acquainted with his merit and the perseverance of his researches to entirely disbelieve the report. We shall, doubtless, soon have further and more precise particulars.

ERNEST LACAN.

Philadelphia, July 8th, 1862.

Our great national holyday, the fourth of July, is passed, and a clear blue sky, and little wind, gave photographers a good chance of making use of the day. It is on such days as this that the galleries do their heaviest business, and extensive preparations in advance are made in carefully-prepared collodion and plenty of clean glass, to accomplish the largest amount of work with the least trouble and delay. I have heard of a large number of photographic excursions planned for the fourth, and, no doubt, a goodly number of dry plates were exposed.

In last week's report of the issues of patents there are two granted which relate to photography: one, No. 35,605, is to C. C. Harrison and Jos. Schnitzer, of New York City, for a lens for photographic cameras. The claim reads as follows:—"We claim the combination of two sets of cemented lenses, as represented in the accompanying drawings, the exterior surfaces of which shall form part of the same sphere, the axes of which shall be coincident, and the other curves of which shall be so proportioned to the focal distance of the combination and to the refractive and dispersive powers of the glass, and in their construction, that the images found at the focus shall be achromatic, and that said image shall be upon, or almost exactly upon, a plane without distortion of form, and including a larger visual angle, substantially as before described and represented." The other patent is granted to William Southworth, of Newcastle, Maine, for a multiplying camera. The claim seems to refer to some peculiar device for moving the lenses in various directions to multiply pictures on the same negative. The number of patents granted in America for photographic apparatus or processes is small—not because they are not applied for, but because the Examiner of this department has abundant information at hand to judge of the originality of the claims made. The American Patent Office differs from the English in one essential particular. In the English office patents are granted without any examination, and the validity of the patents rests with the decisions of the courts of justice. A patent which has been contested and has passed through the various courts is, of course, valuable. In America, the Patent Office has connected with it various grades of Examiners who each have separate classes of invention in their respective departments. Thus photography is classed with the *fine arts,* and in the office of the Examiner, Room No. 5, may be seen every journal in the world relating to photography, and all books published in every language on the subject. The Examiner, too, is an amateur photographer of the highest standing. All applications for patents are referred to the classes to which they belong, and are submitted to a rigid examination:—1st. As to whether any similar thing has been patented in this or any other country by any other person; and, 2nd, whether it has been published in any journal two years previous to the date of the application, so as to have become public property. This examination, of course, causes the rejection of many claims, and saves much after-litigation; but the decision of the Commissioner of Patents is not final, and the true validity of the patent rests with the decision of the courts, should it ever come to trial, as is the case in England.

I find that several of our paper-makers are turning their attention to the manufacture of photographic paper, and some samples now before me, for examination, look well enough, but have not yet been tried.

The solar camera controversy in England is watched with interest from this side of the Atlantic. The argument against the instrument, based on its uselessness in cloudy weather, does not hold good with us; and those of our operators who have dispensed with the reflector, say that bright cloudy weather can be made available. Some few have used a developing process in the absence of the sun; but, as a general rule, that kind of printing has not met with much favour. In regard to the validity of Woodward's patent, in America it seems to be generally admitted. Some few have said they would contest it, but in all cases which have come to my knowledge, the parties have compromised before the case has come to be tried.

M. Claudet's paper *On the Enlargement of Photographs* has been read with pleasure and instruction. His allusion to his use of the solar camera in preparing canvas for painting, by sketching the outline of the image in crayon in place of a photographic impression, calls to mind a use of the camera in the arts, an account of which may be new to some of the readers of The British Journal of Photography. At the Merimac Print Works, Lowell, Massachusetts, the pantograph was first used for engraving on the copper roller—*i.e.,* for transferring the design to the roller. A Mr. Whipple is said to have made the application, and ultimately introduced it in other works here, and even taken it to England. The

principle upon which this instrument depended for accuracy was based on using a copy of the design, say six times the size of the figure to be engraved. To produce this enlarged copy the solar camera was, and is, used in the following manner:—Above a flat table, in a dark room, is placed an ordinary whole-size portrait tube. Light is admitted to this through a box, which shuts out the direct rays of the sun, and utilises the perpendicular rays from the sky. Above the portrait tube is arranged a sliding frame, to carry the design, which is drawn on tracing-paper, and serves the purpose of a negative. All the parts of the apparatus are so adjusted as to produce on the table an image of the required size. A sheet of white paper, or rather a sheet of whitened metal, is placed on the table, and on it is traced the outline of the projected image.

About two years ago Mr. James Hunter, of Hestonville, Philadelphia, conceived the idea of using photography for this same purpose in his extensive print works; and with that view he studied the art, aided by your correspondent, and soon became one of the shining lights among amateur photographers. He does not propose to use his solar camera to produce enlarged pictures by any photographic process, but to use negatives in place of the oiled-paper pattern now in use. He borrows new shapes from nature, and combines the work of his designer with most charming pictures of flowers, leaves, and trailing vines. He has been much interested with experiments in photographic portraiture, and has converted a large conservatory attached to his house into his operating-room. This room has glass on all sides but one, and, by an ingenious arrangement of curtains, he is able to direct the rays of light in any way he may think best to produce any desired effect. He tells me now that he contemplates building a room on purpose for this work, which shall form part of a library and be over a complete workshop.

On the 4th instant Mr. Hunter was my companion in a photographic ramble up the Schuylkill. His place in the country is, every 4th of July, the scene of a grand festival in honour of the day, and the last was no exception to the rule; but, leaving our wives and children to enjoy the company, we stole away to try some dry plates—thinking, too, that a fast horse would take us to some picturesque locality, and we should be back to dinner. We drove in the direction of Schuylkill river, passing through the romantic grounds of what was Joseph Buonaparte's residence during his stay in America. The first view we deemed worth taking, however, was *Tom Moore's Cottage*, on the banks of the Schuylkill. It is a small stone cottage, well white-washed; and this glare of white gave no promise of a good picture. We tried it, however, and how well my plate developed I leave for our kind Editor to determine from the enclosed print. If he likes it, and any of the admirers of the poet desire copies of it, they know where to send exchanges, which shall be duly honoured.* Then we continued our drive up the river, stopping at Manayunk, for pictures of that thriving town, and so on to what is known as Flat Rock Dam. This is the second dam of the slack water navigation of the Schuylkill. Below the falls are rapids, and the river is about a quarter of a mile wide: its bed is full of rocks, and its banks rise quite steep and rugged. It is here that the Reading railroad burrows nine hundred feet through the stone, in what is known as Flat Rock Tunnel. There were so many good views in this locality that we spent much time there, used up all our dry (tannin) plates, then striking off into the country, by a new road, got out of our way, and did not reach home until evening, in time to see them setting the long tables in the maple grove for supper, which was gladly accepted as dinner and supper by two hungry mortals.

From all letters received since that day I opine our national holyday was well used by our amateurs. One writes from New Hampshire that he had hired a room formerly used by a practical photographer, and he should spend the fourth under his skylight "doing up" his wife and little ones in all sizes of pictures. Thompson says he is home from his regiment on furlough, and that he and Henry Anthony spent the fourth in the woods, and that Mr. Anthony used his solidified milk plates (described in my letter from New York), and had secured some charming views.

Speaking of Mr. Anthony and his milk plates reminds me that while in New York he showed me a large collection of glass transparent positives, made by all the known dry processes, and many on wet collodion too. He has tried the various processes in vogue from time to time in order to find the best one for that kind of work, and this collection is the result of those experiments. He had also improvised many modifications of these formulæ, and recorded the effects. I was, however, most interested with a process which he had tried about three years ago, and which he has often urged upon amateurs to experiment with, viz., making transparent positives without silver. He made a solution of Cox's sparkling gelatine, say fifteen grains to the ounce of water, and dissolved in it ten grains of bichromate of potash. With this he coated a glass and dried by heat, exposed under a negative (a strong negative is best), and then immersed it in water, washing well to get rid of all the free bichromate. He then coloured the transparent plates with any of the chemicals whose reaction with the bichromate will produce colour. Different parts of the picture can be coloured differently, and very pleasing effects produced at very little cost. He mentions this in a recent letter to me, calling my attention to it, as he says he has heard others are working on this plan now as something new.

Mr. Shadbolt, in his remarks on photography in America, in THE BRITISH JOURNAL OF PHOTOGRAPHY for June 16, alludes to my letter in the same number, and says that in salting plain paper the "majority" certainly work on sound principles in not soaking the paper in the salt water. I most heartily coincide with Mr. Shadbolt in this matter, and think that the most brilliant pictures are the most superficial ones.

Writing now with the thermometer at 92° in the shade prompts me to drop the heavy scientifics of photography, and end my letter by an anecdote of an Arch Street photographer. One of the enterprising firms who do a good business in fifty-cent ambrotypes was applied to by a lady who prided herself on her correct judgment in matters of art to furnish her with half a dollar's worth of portraits in his best style. She had her sitting, but would not take the picture, remarking that a picture so quickly taken could not be good—that a friend had told her that long exposures were best, and that she would try another place near at hand. The "artist" followed her out, and, observing her enter a neighbouring establishment, sent the rejected ambrotype after her by his boy, with a statement of the case to his friend for his guidance. His rival taking the "cue," descanted on the merits of long exposure, and seated her ladyship before a camera with an empty plateholder in for five minutes, and then sold her the picture made by his neighbour, which she pronounced very good! With due regard, I subscribe myself COLEMAN SELLERS.

* An excellent stereograph of a not very picturesque object, but full of interest from its associations.—ED.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

"DIGNITY" AND "BUNKUM."

To the EDITOR.

SIR,—I simply claim the privilege of a correspondent in addressing you in reply to a few remarks aimed at myself, personally, by my "friend Simpson" (if I may use the familiar expression of another contemporary editor), in the last number of the *Photographic News*.

My friend appears to have an odd notion of "dignity"—a characteristic appertaining to the position of editor which he tries to persuade his readers *he* possesses in an eminent degree—when he thinks it consistent with "dignity" and good taste to rake up the embers of the old quarrel between the Council of the London Photographic Society and myself, as a part of his long and windy reply to the charge made against him of appropriating articles without acknowledgment.

I willingly accept all responsibility in connexion with the proceedings which attended the dispute as to title between the *Journal of the Photographic Society* and this Journal; but what the revival of that subject has to do with the charge of literary "annexation" which you have made against your contemporary—and which also you have substantiated—I cannot for the life of me perceive. Where is its relevancy to the matter now in dispute? Some two years and a-half ago, for business reasons of my own, I claimed to use a title *not* in existence when I adopted it. The law of the land—as interpreted by an eminent legal authority who was applied to for an opinion when my adoption of that title was disputed—would have borne out my right to its use; and had I been as much given to litigation as "friend Simpson" is to "appropriation," he would have had a different story to relate as to the result of that dispute: the Photographic Society's funds would have been considerably further "eased," and *this* Journal would now have been in the quiet possession of the title of THE *Photographic Journal*. Had a friendly note been sent to me by my respected friend, the Editor of the Society's Journal, instead of a legal missive from the Council's Solicitors, I would have made a present of the disputed title to the Council, and thus have saved the heavy drain on the Society's funds, to which so lugubrious an allusion

has been made. But the principals in that quarrel have long since "buried the hatchet." Upon more than one occasion regret has been expressed to me by my then opponents at the "*un*wisdom" of the proceedings instituted to restrain me from using the title chosen; and, at the revival of this little "domestic tale" by one who desires above all things to hang by its skirts, well may the Council of the Photographic Society exclaim —"Save me from my friends!"

However, the dragging-in of this long-forgotten subject served one end for my friend: it helped him to pour forth four mortal columns of "skimmed milk," with which he saturated his pages on Friday last; and if he can find no better *pabulum* for his unfortunate readers, it will soon be time to resuscitate the obnoxious title of "our *weakly* contemporary."

Through you, Sir, I would advise the Editor of the *Photographic News* to be simply honest in the use of his literary "*acquirements*." He ought not to attempt to palm off upon his readers for original matter that which he has quietly appropriated from home and foreign contemporaries. So far as regards this Journal—being well acquainted with the heavy pecuniary expenses incurred in the production of the reports and papers which appear in our columns—*I* will certainly act on the advice so meekly tendered to you by this very modest journalist, and "mind my own business" to this extent, that if he continue his *raids* upon our columns without proper acknowledgment—which he is now not likely to do—I shall be forced to show him that THE BRITISH JOURNAL OF PHOTOGRAPHY is *not* a newspaper, and let him feel that there is such a reality in this country as the law of copyright. We borrow not at all from the columns of the *News:* we are our own providers. I advise its conductor to "go and do likewise."

The Editor of the *Photographic News* boasts of his large journalistic experience. This is not the first time he has written and talked "bunkum" on that point. My own experience of five-and-twenty years in connexion with the newspaper press has at least taught me literary honesty, and the teachings of a higher literature should ever prompt us to "render unto Cæsar the things which are Cæsar's."

The very frequent omission of due acknowledgment of the sources whence my friend draws so largely his "supplies," are no cases of mere "oversight," as he would have us believe. There is here what Mr. Cobden would call a slight "inexactness." Homer *may* have nodded; but he of the *News* is too wide-awake for this plea of "oversight." *Apparently* original articles by Dr. Monckhoven, M. Mc-A. Gaudin, M. Reynaud, or "any other" foreign photographic celebrity, look well in the columns of the *Photographic News;* but its innocent readers *ought* to be informed that many of such unacknowledged articles are mere translations of papers contributed to—and possibly paid for by—say the Paris or Belgian scientific journals.

I shall leave the remainder of the "leather and prunella" of my friend's long namby-pamby article to be dealt with by yourself; merely adding here that it is perhaps not always meet to "answer a fool according to his folly."

Expressing my regret at the introduction of mere personal matter into our columns, and the occupation of so much space that might have been more usefully employed, I am, yours, &c.,

THE PUBLISHER.

CORRESPONDENCE FROM INDIA.

To the EDITOR.

SIR,—Since my return to India, in November last, I have looked forward with pleasure to the bi-weekly arrival of your Journal, and am, at times, indebted to it for useful hints.

I have, for some years past, found pleasant occupation for many an otherwise weary hour in the practice of photography, and I shall be much obliged if you will pass your opinion upon the few enclosed specimens of my late productions.

I almost entirely confine myself now to stereo. pictures, chiefly from motives of economy, but also from deeming the result more pleasing. I work with a pair of double lenses, and also with a pair of single view ditto, both by Ross. The former I should use more frequently than I do, perhaps, for rapid pictures, but for a defect which you can probably put me in the way to remedy.

Print No. 1 shows a light patch in the centre, which I invariably get if my view is well lighted—even with a rather small stop, too—unless I adopt the precaution of placing a brown paper diaphragm of nearly one inch in diameter close in front of the *front* lens. I, first of all, tried prolonging the brass front of the lens by means of a tube, as the projecting front of Ross's stereo. portrait lenses (at least of those I have, and which I got from Mr. Wilson, of Aberdeen) appeared shorter than that part of other makers' lenses; but I did not find this improve matters.

Prints No. 2 were taken with the same lenses, but with the brown paper diaphragm added There is a little *woolliness* about the centre, arising from imperfect focussing, perhaps; but do you think the *lines* are straight enough at the margin, as I thought the additional paper diaphragm in front might make them incline a little?

Print No. 3 is a specimen of what Mr. Sutton's alcoholic collodion *can do* to bother one. I was puzzled by these *veiny* streaks for some time, and wondered how water could have found its way into my iodiser or collodion, as I had seen something similar before from adding water to dissolve iodide of potassium; but at last I fairly *trapped* Mr. Sutton's *pet alcoholic*. Does it require ether, or an addition of *positive* collodion, or should it be thrown away? I find great difficulty in getting negatives perfectly *clean* this hot weather (thermometer at 100° in the shade): its either a streak in the sky (as in No. 4), or lines, or dots, or daubs, or stains, or something or other.

The system of *exchange* now adopted at home must work very satisfactorily. Can you put me in the way of an exchange, if you think my productions would be valued by anyone but myself?

Our good friends *at home* constantly request us out here to take groups of the natives, but they little know what a labour it is. Only point a camera at a native, and notwithstanding his natural grace, suppleness of limb, and easy carriage and bearing when taken unawares, from fear of being *shot*, or converted into some uncouth animal by means of necromancy, he becomes, on seeing you, as *rigid* as the camera-stand, or moves away altogether, or neither moves nor stays. All the posturing and explaining and reasoning and coaxing or offers of money you can bestow upon him in the course of an hour or two will not induce him to *unbend* if once on the *qui vive;* but catch him *flying* and he adds to a picture, no doubt.

My water-tight bath has a top of India-rubber fastened to a piece of wood; but, from the combined effects of heat, and the monkey-like fancy on the part of a native to screw down the top till he could screw no tighter, and so forcing the glass into the rubber, the latter has become sticky and soft. Can you suggest any method of rendering it hard again?

No. 5 I thought the best picture I had taken in my last jaunt. The negative certainly promised well, but I find it difficult to get a brilliant print from it. I always develop with iron, even in the hottest weather, and am trying to dispense with the addition of silver so as to prevent the *snowy* appearance which most of our Indian photographs have, more or less. Can you promise me any encouragement that I shall succeed?

I correct my negative bath with oxide of silver and nitric acid, and I use Horne and Thornthwaite's collodion, which I find very good, especially their ready iodised quick portrait collodion; but I do not know what it is iodised with, and I find my bath gets soon acid. Would not iodide of cadmium do it, and, if so, how is it best to *doctor* the collodion? Iodide of ammonium will not keep in this country, so I cannot add any, having none, and I do not wish to be often meddling with my bath. Would opium in the collodion be useful? We have plenty of *that*.

I wash my prints under a tap in a flat dish with holes in the bottom, the stream being sufficient to run *over* as well as through the bottom of the dish. I empty the dish too, frequently, and wash for six or seven hours, and even longer if the prints exceed ten or twelve in number.

I fear it would be asking too much of you to test one or two of my prints and favour me with the result. I have some photographs, printed in 1857, in my album which show no signs of change, though merely washed in frequent changes of water by hand; but still I am not quite satisfied that even now, with a better arrangement, perhaps, I *quite* rid my prints of that detestable hypo.

I admit, though I have several years' experience, that *I cannot print* yet. The tone of the prints enclosed is not by any means what I aim at, though these even were *once fair to look upon* and *full of promise* until that *blighting* hypo. dissolved away their beauty, and showed how evanescent it was—not even *surface deep*.

I decolourise my printing silver bath with oxide of silver, acidifying with acetic acid. Is this a good plan? I also, when in a very economical mood (for an amateur), evaporate my print-fixer to the proper strength for negative-fixer by exposing it to the sun. Can any harm result from this?

I have a twenty-guinea Voigtländer lens, scarcely used, *and too large for my pocket*. Would Mr. Morley, or any one else, buy it, or give me the equivalent in photographic material, if I could send it to him, and he was satisfied as to its being *as good as new?* The foci are non-coincident.

Can you tell me where I can obtain good albumenised paper for stereos.—not too thin? And which *dry* process can you recommend for India?

But I have trespassed too far on your time and kindness, I am sure, already, and must close my epistle with an apology for so doing. At the same time, though requesting you will favour me with some notice in the next number of THE BRITISH JOURNAL OF PHOTOGRAPHY, if you cannot grant me all the information I want, any hint you can throw to "Bombay Amateur" in your notice to correspondents will be accepted with thanks and esteemed a favour.—And now, reiterating my apologies for troubling you at such length, I am, yours, &c.,

BOMBAY AMATEUR.

Tanna, near Bombay, June 9th, 1862.

[Your double-combination lenses no doubt produce the central fogging, from reflection from the inner surface of the mounting tube. Observe if it be a good *dead* black; and, if not, line it with black cloth or velvet, putting the smooth side of the cloth in contact with the tube. The slight bearing inwards of the lateral lines in No. 2 is due not to the stop but to tilting the camera.

We are not sure that you are correct in condemning the alcoholic collodion; but it strikes us that absolute alcohol, being very hygroscopic, it may in a moist atmosphere have absorbed a considerable proportion of water. Put into it a few shreds of dry gelatine. If there be any water present they will absorb it and swell, and the collodion may be poured off. At any rate, do not throw away the collodion: it will always do to clean your glass plates with at the worst.

Using citric acid in the developer may save you some streaks and stains, because in a hot climate acetic acid evaporates very quickly, and thus parts of the plate may have too little to save them from being unequally acted upon.

The top of your bath may be covered over the India-rubber with gutta-percha-tissue, or oiled silk; or, perhaps, better still, with parchmentised paper, which you may make for yourself. We fear, however, that you cannot *remove* the stickiness.

You have every reason to be satisfied with your productions, No. 5 especially. No. 4 is also good. A little more skill in printing would enable you to get more brilliant proofs from your negatives.

Iodide of cadmium has *not* a tendency to produce acidity in the nitrate bath, and we should not advise you to interfere with the collodion. If your bath gets acid you can correct it with oxide of silver. We advise you not to add anything to your collodion, but to use it pure as you procure it.

Your prints stand very fairly a pretty severe test to which we have submitted them. We believe them to be sufficiently washed, but we fancy you do not allow them to remain quite long enough in the toning bath to secure them from change in the hyposulphite of soda.

There is no harm in employing hyposulphite of soda that has been used for fixing proofs previously for the fixation of negatives. No doubt Mr. Morley would meet your wishes. We have had good albumenised paper from many dealers; but we cannot say where you can make sure of always getting it, because the fault is sometimes in the fabric of the paper itself.

We strongly advise the tannin process as most certain for a hot climate, and next to it the collodio-albumen process.

Lastly. With regard to exchange, we advise you to join the Amateur Photographic Association. Your negatives will then get well printed and utilised, and you will be saved much labour at little cost. We have no doubt that your subjects would be popular.—Ed.]

A HINT TO PROFESSIONAL PORTRAITISTS.

To the Editor.

Sir,—I have just seen announced for sale the card-portrait of the *Rev. Mr. Reade*, and read with pleasure your commendatory notice of it. I have no doubt but it will meet with a quick sale. But why are not the portraits of other photographic celebrities put within our reach as well—portraits of poor Scott Archer, Fox Talbot, Daguerre, Niepce, Hardwich, &c.? Surely they would be gladly purchased by every lover of photography, and have prominent places in our albums. Perhaps they are to be had; but as I have no recollection of seeing any notice of the like, I ask the question, hoping you will not think my doing so impertinent.—I am, yours, &c., J. H. ERC.

[A good idea, but, unfortunately, the time has already gone by for securing the lineaments of some named in your note: there is, however, no reason why a beginning should not be made at once, and before others connected with the rise and progress of our art shall have passed away. —Ed.]

A SICK BATH.

To the Editor.

Sir,—1. On commencing last week at my photographic amusement, the baths I made up a few months previous, and only worked twice, and was in good working order when left up (but I strengthened them before use up to 35 grains), when I tried them next day—in taking off the negative of a friend—every plate was weak and foggy, and I could not press the intensifying far enough; in fact, not two shades deeper than it appeared after the first development. I used two developers, the first was—

Protosulphate of iron	10 grains.
Acetic acid (glacial)	12 minims.
Boiled rain water	1 oz.

Second developer—

Pyrogallic acid	1 grain.
Citric acid	½ do.
Water, same as above	1 oz.

With a few drops of 20 grains solution of silver to intensify.

I used Keith's (Liverpool) negative collodion—Perry's (Sheffield), which is a negative and positive collodion—and Ramsden's collodion. The above developers I worked both strong and weak; also used the pyrogallic alone. The collodions were all fresh—Perry's only iodised a week. After all, flatness and fogging were the results. As to light, I do not think it could get in at any place. I looked for it well, for I considered the fault was in the silver. I got the latter from one of the first houses in Dublin. I wrote about it to them, and they said it worked well with them. I forgot to say after the first bath failed, I made a new one, coated a plate with collodion, and left it in the bath all night. Next day tried it, but met with the same result. I made another, and the same result followed.

2. Should the baths not work, what is the easiest way for me to remove the silver from the bath, and prepare it for use again? and will the remainder of 3 ounces that I have not made into baths—about 1 oz. —do to excite my albumenising paper on? Is it good enough?

3. Are my baths properly made up for the negative work, and would you recommend me Maddison's collodion before the three first named?

In conclusion, I hope, sir, you will excuse my many queries. I have often before got into little difficulties, but have taken pleasure in working myself out of them at some expense. An answer, when time permits, will oblige.—I am, yours, &c., T. G. P.

Trim, Meath, Ireland, 10th July, 1862.

[1. You say nothing about *acidity* or *alkalinity* of your bath. It is not improbable that it is slightly alkaline, and, if so, the remedy is obvious:—add cautiously a drop or two of dilute nitric acid, and try again; or, add to your collodion enough dilute tincture of iodine just to tinge it of a straw colour. But if your bath is already *acid*, and yet produces foggy proofs, you may conclude that it contains organic matter that renders it unfit for use as a bath for collodion, and you had, therefore, better discard it for that purpose.

2. Read Mr. Corey's excellent article in our last impression. The remainder of your nitrate of silver will do very well for exciting paper.

3. Your baths appear to be prepared in the proper way, and we have no fault to find with any of the collodions you name.—Ed.]

LENS-QUERIES.

To the Editor.

Sir,—The subject of long and short focus lenses is a very important one, and demands mature consideration at the present time.

Allow me to ask you, as a practical man, the following questions. Being a novice, I write for information:—

1. At what distance from the sitter should a 4½-inch focus Dallmeyer lens be placed?

2. Would it not be straining this or any lens to come within the equivalent distance to the focus?

3. A lens being at the right focal distance, would you not obtain a more perfect portrait by going still further back?

4. Can you get a portrait in such *perfect proportion* with a short-focus lens as with a long, for a portrait *precisely the same size?*

5. Would not a long-focus lens be as quick for the *same size of portrait* as the short, considering its distance from the sitter, and the relative position of the ground-glass to each lens?

6. Is not the centre of the lens the only part free from distortion?

If you consider these questions worthy of notice, I shall feel obliged by your replying to them.—I am, yours, &c., AN ARTIST.

Cheltenham.

[1. What you call a 4½-inch focus lens would be probably about 6 inches *equivalent* focus, in which case a distance of ten feet would do well enough, and even something less might, if need dictates, be adopted.

2. Unintelligible. You misunderstand the term *equivalent focus*, which indicates the focus of a single lens that would produce an image of the same size as the image formed by the compound one of the same object at the same distance from the lens.

3. Obscure; but we presume you mean to ask, for instance, whether in case cited in No. 1, if you remove the lens to twelve feet from the sitter, you do not get a more perfect picture than at ten feet distant? Probably less visible distortion, but not necessarily a more *perfect portrait* in other respects.

4. No.

5. Not unless the diameter of its aperture were fully as large in proportion, and scarcely so even then.

6. Not of the double combination.—Ed.

HOT WATER PROCESS.

To the Editor.

Sir,—The hot water process seems to trouble more than Brother Jonathan. For my own part I have every reason to believe Mr. H. E. Chalkey to be the originator of the hot water manipulations. Perhaps some of your readers may have noticed in The British Journal of Photography (May 1st and 15th) notes from that gentleman, stating the origin of the hot water process. I have used it ever since July, 1857, in dry-plate photography before and after development with *hot* and *cold* developers, all depending on the subjects to be photographed and exposure convenient to meet the case. It is a mistaken idea that the sensitive properties of the dried collodion film are not influenced by the hot water treatment. I fearlessly state that in my hands I can vary the exposure from ten minutes to absolutely instantaneous exposure, or, in other words, to as rapid as the action of the eyelid. I frequently try the following experiment upon plates set aside for the purpose, and for testing their keeping properties. The plates mentioned have been prepared four years and four months.

The plate is cut originally into two equal triangular portions, one of these (No. 1) I expose for *ten minutes*, and develop in the usual way; the other triangular piece I divide into two, by a cut parallel to the base, making one small triangular piece (No. 2), and a four-sided piece (No. 3. Twelve hours before exposure of No. 2 I treat it with hot water, and expose for *ten seconds*, and again submit it to hot water and develop with a cold developer. No. 3 is treated in a similar manner, but the exposure is only *one second*, and a *warm iron* developer is employed. The general result of the three portions is similar—that is, clean, sharp pictures at all times.

The three exposures of the portions of the plate are conducted at the same time, using similar lenses—say portrait lenses of four and a-half-inch foci with a quarter-inch stop between the lens, or ordinary view lenses of five-inch foci and a quarter-inch stop. I must here state that in all cases the view lenses give the best pictures in my hands. I should wish to know whether other dry-plate experimentalists have noticed the deterioration of the impression in keeping the plate after exposure. I find in many cases (but not as a rule) that the plate regains its *former normal* state in *six or eight weeks*, and may be exposed again, and, when developed, no trace of the former exposure is to be seen—the same having repeatedly occurred, to my great annoyance, when I have not developed within a limited time, say three weeks.—I am, yours, &c.

H. R. NICHOLS.

"PRINTING" QUERIES.

To the EDITOR.

SIR,—I am much obliged to you for your information regarding the fault of the print of the *Jed*, as it has entirely removed my difficulty.

I am not very clear as yet on the head of query 1st, and will thank you to dispel a little more of our Scotch mist. Hardwich mentions that each quarter-sheet of albumenised paper, eleven by nine inches, removes one fluid drachm and a-half from the bath, equivalent to about one grain and three-quarters of salt, including droppings. Now, by multiplying that by four gives me seven grains of salt for the whole sheet, and reckoning three grains of nitrate for each grain of chloride in the albumen gives me twenty-one grains for the whole sheet. Now, where am I wrong, as wrong I must be? I trust that you will put me right in your next number.

Enclosed are some prints. I will thank you to correct me if they are wrong in any way as to tone, &c.—I am, yours, &c., N. B.

Jedburgh, July 22nd, 1862.

[Your calculation is not necessarily wrong; indeed it is not wide of the mark, if you bear in mind that the quantities specified are only approximate—*about* so much. Now, if two and a-half drachms be used for each sheet, one ounce of silver solution (containing eighty grains of nitrate) will sensitise three whole sheets and one-fifth; and if each sheet contains seven grains of chloride, and three grains of silver are appropriated by each grain of chloride, we have $21 \times 3{,}2 = 67.2$ grains out of the eighty accounted for. But the albumen also consumes a portion of the silver solution, and some is lost by dripping, &c. Again: it is probable that two and a-quarter drachms may be nearer the actual quantity consumed by each sheet, in which case about seventy-four grains out of the eighty will be accounted for—quite as near an approximation as we can expect where there are so many indefinite quantities.

Your stereographs are good, though the printing of that in which the bridge is seen is a little *mealy*, probably owing to the paper having remained rather too short a time on the silver solution.—ED.]

MYSTERIOUS DISCOVERY.

To the EDITOR.

SIR,—Can you tell me what the following mysterious paragraph, quoted from the *Journal of the Photographic Society*, bears reference to?

"After a long battle with the guardians of established rights, the Italy of the Arts, as we may now fairly term photography, has made good her pretensions and received her place. * * * * We have done it. Our Palestro, our Volturno, have been fought and won: peace has been made!"

1. What have we done?
2. What have we won? And
3. When shall we get it?—I am, yours, &c., BOTHERED BOB.

[1. "Put our foot in it." 2. A snubbing. 3. We have it.—ED.]

ANSWERS TO CORRESPONDENTS.

*** We have again been compelled to leave over till our next number several articles which are in type.

F.—Received: thanks.

SCREED.—"Bide a wee:" we shall see.

T. O.—We will try and ascertain for you.

C. E. E.—Received, but too late for notice in this number.

ALFRED SMITH.—Note received: photograph not yet to hand.

RUDOLFE.—You will have found that we anticipated your wish in our last.

E. E.—Want of space compels us to postpone a notice of your specimens till our next.

R. B.—Your portraits are too flat in appearance—an effect produced by the entire absence of shadows. Shut out some of the light from one side of your sitters.

ROBERT A.—Your sensitising bath is too weak: probably it has become so by use. Add some crystals of nitrate of silver—say twenty grains to each ounce of solution.

C. C. F.—OXYGEN.—AU. CL.—Thanks for your offers; but we have no desire to do more than obtain justice. We have no animosity to gratify: there is plenty of room for both.

CHAS. MORGAN.—Your albumen is deficient in chloride; hence the weakness of your proofs, and their reddish tone. Instead of two grains to each ounce, you may use *ten* with advantage.

GEO. ROWED.—We are unacquainted with the commercial value of negatives; it is a matter upon which we have no experience. We are in a similar condition with regard to salaries given to operators.

SAUCY SUE.—We do not deny the correctness of your *nom de plume*. No doubt you are well informed of the matter; but—our contributor really is a married man, whatever you may think to the contrary.

S. COHEN.—You may depend upon the genuineness of the articles sold at the establishment you name, so far as their being the veritable productions of the makers whose name they bear: more than this we cannot say.

J. C.—There is not any publication recently out, with which we are acquainted, that is wholly devoted to the subject of "instantaneous photography." You will find all the most recent information on that subject in late numbers of this Journal.

AN ANXIOUS LEARNER.—You have not used a sufficiently strong silver bath for exciting your paper: probably it has been weakened by such an enormous dose of citric acid as you have used to clear it. Your negative appears to be a very fair one.

RACHEL GRAHAM.—We are not aware if Mr. Blanchard's stereographs of *A Country Fair* are to be had in Wales; but a note to his publisher, Mr. Elliott, of No. 5, Aldermanbury Postern, London, will, no doubt, be attended to. The photographs can be sent by post, and a post-office money order will pay for them.

J. A. S.—We do not mind trouble in aiding our correspondents in any real difficulties; but when they can obtain the information they desire from any good manual, it would be manifestly unfair to our readers generally to occupy the space required for mere elementary matter. It would take at least a page to answer properly all your queries, and you will find them copiously explained in Hughes's *Manual*, and several others of a like character.

PITCAIRN.—Your proof is a very fair specimen for a young hand; but it has faults, though not bad ones. You have a little over-developed your negative, producing a spotty appearance on the rhododendrons or laurels, for we cannot distinguish which. The sky is *rather* weak, but the definition is good throughout. The lens is an excellent one, and the manipulation clean and careful. The subject is uninteresting and leaves no scope for artistic skill; but, such as it is, you have made the most of it. The lens you have employed will cover nine by seven inches well, and by management, upon occasion, ten by eight inches.

A. B. (Workington).—Your two specimens of stereoscopic photography, delineating iron ore pits, are, no doubt, interesting, and are very fairly executed. We doubt, however, whether they will be popular, as there is but little of the picturesque or beautiful about them. Do you not err in describing them as *underground?* Are they not simply deep excavations open at the top? and, if not, how did you illuminate them? Your note was subjected to considerable delay in reaching us in consequence of your having forwarded it to Liverpool—an error that we are surprised to find some of our correspondents occasionally fall into, seeing that a notice appears in every number with information where to address *editorial* communications.

W. DANIELS.—Before positively deciding that it is your nitrate of silver that is in fault we think you ought to try it with another sample of collodion. Perhaps your exposure has been too prolonged: try a plate with a short exposure. If your bath still is in fault, render it alkaline by the addition of liquor ammoniæ, and expose it in a glass vessel or a shallow dish to direct sunshine. A black deposit will fall, which must be filtered out. Then make the solution very faintly acid with dilute nitric acid. Develop your honey plates with citric ac d, one grain; pyrogallic acid, one grain; distilled water, one ounce. If the weather gets warmer, increase the proportion of citric acid. We shall be happy to receive your stereograph, but not if it puts you to any needless trouble or expense. No apologies needful for seeking advice: it is always willingly accorded.

W. D. C.—Your packet of card-portraits proves that you have considerable manipulative skill. The printing of some specimens is a little weak and flat, and there are some artistic errors that you will easily remedy when once your attention is drawn to the points involved. Your balustrade produces an ugly horizontal line, because you always use it at right angles to the camera: as a rule you will find it "composes" better when viewed obliquely. It is particularly obnoxious in Nos. 2*b*, 8, and 9; and an equally bad effect appears in Nos. 10, 11, and 12, from the horizontal line in the wainscoating of the wall. It is very objectionable to overload the background with accessories, especially with a pedestal and vase on one side, and a pedestal and column on the other, as in Nos. 1*a*, 1*b*, 3, and 4: there are too many lines distracting the attention from the figure. As a rule the *pose* of most of your figures is good, it being natural and easy—in Nos. 13*a*, 13*b*, 14, 3, 5, 2*b*, and 8, particularly so; and in these the photography is also good. Your groups, however, are imperfect. In No. 11 the lady should have been turned more towards the operator's left hand: this would have allowed the child on the knee to have been in a good position without being so constrained. The older boy should have stood on the other side, and the girl might have been *seated* close in front on a low stool. A reversal of the positions of the two children in No 12 would also have improved the group. Your skill (especially for an amateur) is such as to keep you no doubt well employed by your friends; and we fear that if you improve much more you will have too much to do.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 172, Vol. IX.—AUGUST 15, 1862.

Panoramic Photography.—We have been favoured by Mr. Parry with specimens illustrative of his paper read before the Manchester Photographic Society, which paper was published in our last issue, page 286. The subject of each picture consists of a waterfall and rocks (all different), occupying the whole of the plate to the almost total exclusion of sky, consequently very trying to the success of the plan adopted in taking them. In one the line of demarcation between the two portions is very perceptible, in another but slightly so, and in the third scarcely to be detected at all. It is therefore quite possible, by careful manipulation, to obtain sufficiently accurate representations of scenery adapted for this kind of treatment with an ordinary single or bi-lens stereoscopic camera, and this without interfering with its original purpose of taking stereographic negatives. It is of course evident enough that the perfect integrity of the perspective is sacrificed quite as much by Mr. Parry's plan as by that of Mr. Sutton with his panoramic lens, though the character of the variation from strict accuracy differs somewhat. By the former, the image of a straight row of buildings with horizontal lines would be such as to represent parallel lines as converging towards points at each end, and forming a very obtuse angle in the centre. By the latter the same would appear as two arcs of a circle with their concavities towards each other; but in both cases the attempt to delineate such an object would be simply a misapplication of the respective arrangements.

There is one evident advantage possessed by the panoramic lens over its competitor, viz., that the whole picture can be exposed at once, and that without any chance of failure on account of the possible existence of the perpendicular line of demarcation; but it is questionable whether this is not more than counterbalanced by the fact, that no additional apparatus is requisite to the possessor of a stereoscopic camera except what he can make for himself, and, even if he has to set himself up *ab initio*, the latter is the less costly of the two, and admits of greater general accuracy in focussing.

Mr. Parry is, therefore, entitled to commendation, not only because he has successfully practised a plan by which a desirable result may be accomplished in a manner different from that hitherto employed, but because he has shown photographers how they may turn to profit that which has hitherto been lying useless, or, what is the same thing, only partly used, just as a clever manufacturer makes a profit out of the waste of his competitor.

We are of opinion that for the success of Mr. Parry's plan it is not absolutely requisite that the camera should turn on the lens as a centre. Theoretically it is correct no doubt, but practically we believe that the camera may turn on any convenient centre; and, if so, the arrangement of adjusting pins may be the work of but a few moments.

Of course the class of subjects most suited to the kind of delineation here proposed, is that in which there is no very prominent object in the exact centre possessing horizontal lines: in other respects there need be scarcely any restriction

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Spectres of Former Impressions.—We published in our number for July 15 (page 268) an article by Dr. van Monckhoven, read by that gentleman before the Académie des Sciences, *On an Observation of Moser's Images*. The method employed by the learned doctor for rendering the somewhat spectral image more perceptible to the eye—that of taking advantage of the phenomena of polarised light—is most ingenious, and it would be highly interesting to ascertain whether its application to the collodio-albumen plates fixed before development, as introduced by Mr. Young, of Manchester, would elucidate the problem as to whether any actual reduction of the sensitive compound employed does or does not occur under the actinic action.

The special point of interest involved in the subjects of Dr. van Monckhoven's observations would be an inquiry into the cause which influences the production of the exceptional phenomenon of the persistance of an apparently obliterated image, and upon this point we have a few remarks to make. Some time back, when working at micro-photography, we noticed a plate, which we had exposed and developed, upon which were some ugly stains. The slip of glass was thrown aside, and, when again used some time afterwards, we found precisely similar defects. It was again treated as before; but, on once more trying the same slip of glass after carefully cleaning it, we still found the stains appear in precisely the same places. Struck with so remarkable a circumstance we submitted the glass to microscopical examination after being well cleaned, and found that it presented a very minutely granulated surface, as if the roughness of the grinding had not been entirely taken out by the polishing process. It is necessary to remark that the slips of glass employed were those generally used for mounting microscopic objects, being three inches long and one inch wide, and cut from the waste portions of sheets of patent plate glass. Subsequently we came across several others slips of glass which behaved in a similar manner, and when we met with them we always found, on examination by the microscope, that they presented the peculiarity of surface above indicated. Now it appears to us that if the condition of surface that we have described be found to exist upon plates which preserve the spectral images, we may reasonably conclude that the minute but closely-located cavities retain still more minute particles of reduced silver, insufficient, indeed, to be detected by the unassisted eye, but, when associated in the order of an image of any kind, enough to make an impression upon the chemicals (each particle acting as a nucleus of chemical action), and so to reproduce a kind of visible echo of the original. It is not improbable, if our conjectures are well founded, that soaking such plates in a mixture of cyanide of potassium and iodine would be sufficient to remove the spectral impulse. We have already communicated these conjectures to Dr. van Monckhoven, and shall feel curious tol earn his ideas thereupon.

Artistic Copyright Act.—We congratulate our readers on their having at length obtained, by the passing of the Artistic Copyright Act, the means of protecting their works from being pirated by those who prefer robbery to work, or who have neither the wit nor the skill to produce anything original of the smallest value. It is full time that a stop should be put to the nefarious practices of those who trade unfairly upon the mental

labours of others; and we are rejoiced to find that the long-desired measure of justice to the chief ornaments of the photographic guild has been placed within their reach. We have, of course, carefully looked through the provisions of the Act, in order to ascertain precisely how photographers are affected thereby; but we have found so lucid an exposition of the principal points in the pages of the *Athenæum* that, instead of summarising them, we shall extract the observations of our contemporary as follows:—

"Last week we furnished our readers with the most important clauses of this statute. It must be borne in mind that it only relates to 'every *original painting, drawing and photograph*,' which shall be or shall have been made either in the British dominions or elsewhere, *and which shall not have been sold or disposed of before the 29th of July last*.—The term of copyright granted by the Act is for the author's life and seven years afterwards; but the benefits of such copyright will be lost without *registration* of the work, because it is expressly enacted that 'no proprietor of any such copyright shall be entitled to the benefit of this Act until such registration; and no action shall be sustainable nor any penalty be recoverable in respect of anything done before registration. *Practically*, therefore, the grant of copyright is made subject to the performance of the condition precedent of registration. It is consequently of the utmost importance to every author and proprietor of a copyright picture, drawing, or photograph, that it should be registered *immediately* upon its completion.

"No one need be alarmed at the trouble or cost of registration. It is an affair of the most simple and inexpensive description. The office appointed for registering under the Act is at *Stationers' Hall*, which is in 'Stationers' Court,' on the north side of Ludgate Hill. It will only be requisite to obtain, fill up, and sign a printed form. To this a sketch, outline, or photograph of the work registered *may* be annexed. The form, properly filled up and signed, must be left at Stationers' Hall; a fee of *one shilling* paid to the registrar; and this will include the whole mystery and trouble of registration. Let it be clearly understood that it will not, under any circumstances, be requisite to produce the picture or other work in which the copyright is claimed to the registrar either at Stationers' Hall or elsewhere; and that neither the author nor any other proprietor of a copyright work can be required *personally* to attend for the purpose of registering it. Practically, we make no doubt that the registration of an artist's works will be entrusted to his frame-maker, and that the author of a work will never find it requisite to quit his own studio for the purpose of such registration. At the time of registering a work, we think it will be found most advisable to obtain from the registrar a certified copy of the entry of the work registered, because such copy under the hand of the registrar and seal of the Stationers' Company 'shall be received in *evidence* in all courts, and in all summary proceedings, and shall be *primâ facie* proof of the proprietorship of copyright or licence as therein expressed.' Besides, the production of such certificate by the proprietor of a copyright work will aid its authenticity, and consequently add to its pecuniary value. The registrar's fee for a certified copy of the entry in the register is *five shillings*, the same as it is for a similar certificate of an entry as to a literary or musical copyright work.

"As to the persons who are entitled to be registered as the proprietors of a copyright in a picture, drawing, or photograph, they are:—1. The *author* of any such work who has executed it on his own account, not as a commission, and has not sold or otherwise disposed or been dispossessed of his copyright therein. 2. The *purchaser* of an author's copyright in his work executed on his own account. 3. The *employer* for or on whose behalf a picture, drawing, or photograph shall have been executed, and who accepts the same, after its completion. 4. The *husband* of an authoress of any such uncommissioned and unsold work. 5. The *legatee, executor, administrator, assignee in bankruptcy*, or other person in whom the copyright may have been vested by bequest or operation of law.

In the event of any entry in the register being either wrongfully or erroneously made, the person who shall deem himself to be aggrieved by such entry may apply to one of the Superior Common Law Courts in Term time, or to a Judge thereof in vacation, for the purpose of expunging or varying such entry; and such Court or Judge has power to order the entry to be expunged, varied, or confirmed, either with or without *costs*, as to such Court or Judge shall seem just.

"The *sale* of copyright in a picture, drawing, or photograph must be made by some note or memorandum in writing, to be *signed* by the proprietor of the copyright, or by his agent appointed for that purpose, in *writing*. And when an artist first sells or disposes of his picture, or executes it on a commission, if he means to retain the copyright, he must remember that he can only do so by its being expressly reserved to him *by agreement in writing, signed at or before the time of such sale or disposition by the purchaser, or the person who commissioned the work*, as the case may be. Any such agreement may form part of the receipt given for the purchase-money: a duplicate of such receipt should be made, so that each party may retain one, to be signed by both the vendor and purchaser or owner of the work. To obtain the protection of the statute, the first and every subsequent purchaser of a copyright *must*, as it seems, register his *assignment* thereof.

"And now one word of caution to artists, amongst many of whom it seems to be imagined that any slight variation in the design or colour of a picture is sufficient to render it an *original* work. Nothing can be more erroneous than this artistic construction of the meaning of an 'original picture,' and it is of great importance to artists that they should correctly understand and appreciate their position on the subject. According to the law as it now most justly stands, in every case where an artist is not the proprietor of a copyright in the picture executed by him, *it will be at his peril if he copies or repeats the design, or any material portion of it, without the consent in writing of the proprietor of the copyright in the original work*. Apart from the penalties imposed by the statute for any such act of piracy, the proprietor of the copyright would be entitled to sue the offender for such *damages* as the proprietor could prove he had sustained by the infringement of his copyright.

"If artists will but take reasonable care to secure their copyrights, and also bear constantly in mind what is *just* as regards the interests of the purchasers of their works, neither they nor any honest dealer need fear the operation of this new law of Copyright in Works of Art; on the contrary, we believe it will prove a great boon to all honourable men, and that fraudulent manufacturers and dealers will be the only sufferers, to the inestimable benefit of British art and artists, as well as of the public generally."

We have underlined a few words in the preceding, as we fear that the writer had for the moment forgotten the possibility of photographers "repeating a material part of the original" and yet not infringing the copyright. The second clause in the Act stands thus:—

"Nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding that there may be copyright in some representation of such scene or object."

We can scarcely venture to hope that this clause will escape giving rise to litigation. Of course, if a second person takes a second likeness, for instance, of some noted individual, posed in the same attitude as when taken by a previous operator, it is clear enough that no infringement of the original or earlier negative will have occurred; but, if an operator commissioned to take *a* negative, takes *two* at the same instant, by means of a bi-lens camera, and then supplies one to his principal and retains the other himself, we apprehend that *in equity* there will be no doubt that he does infringe the copyright of his employer. We shall be curious to learn what decision upon the point will be given *in law* should it have to be tried.

A CONTRIBUTION TO THE BROMIDE QUESTION.

By George Dawson, M.A.,

Lecturer on Photography at King's College, London.

Experiment has not yet solved the difficult problem, whether, under circumstances where great rapidity is required, a bromide combined with an iodide is advantageous or not in wet collodion. The truth is that we understand but very little of the nature of the delicate chemical and mechanical conditions conducive to sensibility. Hence our experiments are, to a considerable extent, a mere venture in the dark. So sudden and intricate, also, are the decompositions induced by actinic influence aided by a developer, that they escape our notice, and we can only guess at their order and nature when the effect has been produced. We are never sure, even in conducting two consecutive experiments, with apparently the same chemicals and in the same manner, that all the conditions are identical. Under such circumstances of apparent similarity, conflicting results are often obtained. Less likely is it for two independent operators, with time, chemicals, actinism, &c., all more or less different, to arrive at identical conclusions. One gentleman, for instance, experimenting with seemingly pure materials, obtains rapid and excellent results on a bromo-iodised film only. Straightway he rushes to the conclusion, that the same must hold good in all instances. Another gentleman, with the other chemicals of apparently the same kind, finds an iodised superior in every way to a bromo-iodised collodion. Both may be right in their deductions, and to reconcile them we must suppose there are conditions—unnoticed or, perhaps, unappreciated by the operator—present in the one case which were absent in the other. Nevertheless, it is only by varied and patient experiment we can hope to resolve our doubts. The most rapid actinic effects that have come under my notice have been on a simply iodised film with a pyrogallic developer. But I am not prepared to say that a bromo-iodised collodion and iron developer may not be capable of at least equal rapidity. One advantage in favour of the latter, which is entirely

consistent with my own experience—and now, I believe, generally admitted—is the essential service obtained by the use of a bromide and iron developer in the case of impure chemicals. A bath, for instance, containing an excess of organic matter, and in consequence yielding foggy pictures with a simply iodised collodion and pyrogallic developer, will often act well on the addition of one grain of any bromide to the same collodion, and using an iron developer. A curious instance bearing strongly on the point has just occurred in my own practice, and may perhaps be worth recording. Had the fact been related by another, without confirmatory evidence, I should feel disposed to class it in the same category as the alleged "moonlight pictures," and similar photographic *canards*. A photographer of long standing, who was present and assisted in making the mess, is ready to vouch for the strict accuracy of the following details.

I had added about fifty grains of citric acid to some eighty ounces of old used-up collodion baths, previous to the solution being evaporated down for exciting positive paper. During the process of filtration about half the quantity was accidentally spilt on the laboratory floor—not a very clean one, for never to my knowledge has it been once washed. Some dirty dusters and other cloths nearest to hand were instantly thrown and pressed down to absorb as much as possible of the solution. After sponging and rubbing for a short time till they were quite saturated, the filthy black liquid was wrung from them into a jar, in order to be precipitated as a chloride. But, as in the course of recent experiments several extraordinary instances of a bromide counteracting the baneful effects of impurity of chemicals had come under my notice, I filtered the collected liquor through double filtering paper, for the purpose of trying its effects on a bromo-iodised collodion plate. I scarcely expected any kind of success. It nevertheless, to my great astonishment, worked rapidly and very clean, giving great intensity and half-tone, without any subsequent redevelopment. The collodion was of a rather spongy nature, made from cotton, in acids at a high temperature, and iodised with two grains of iodide of cadmium, two grains of iodide of ammonium, and one and a-half grain of bromide of cadmium. The same collodion, simply iodised with equal parts of cadmium and ammonium, neither with pyrogallic acid nor iron would yield anything better than the merest shadow of a picture, barely visible through fog. This bath I have had now in daily use for more than a fortnight, and it still works as well as any bath I ever made from the purest nitrate of silver.

I do not recommend any one troubled with bad baths to throw them down on a dirty floor, and slop up again, for the purpose of curing them. His experience may not turn out so satisfactory as mine. I mention the fact for the purpose I have stated, viz., to show the protection bromide affords to iodide of silver, or *vice versa*, against at least some hurtful impurities. In this sense the bromide may be said to be an accelerator; but how it acts is a mystery which, I fear, Mr. Sutton's newest theory—no more than his old—will be unable to solve. In the waxed-paper, oxymel, tannin, and several other dry processes that have come under my close observation, free iodine acts to some extent, but less energetically in the same direction; but I doubt whether it increases the sensibility. Both protect the sensitive surface from the baneful influence of organic matter almost always present in the dry processes, and give greater transparency in the shadows and intensity in the high lights. The iodine probably effects its object by liberating free nitric acid when brought in contact with the nitrate of silver. A bromide under similar circumstances, although it does not liberate acid, besides conferring clearness and intensity, conduces also to greater sensibility, and that in a very marked degree. How it acts we know not. We may call it "catalysis" or any other hard name we please, but we only thereby show our ignorance.

ON THE ADHESIVE MATERIALS EMPLOYED FOR MOUNTING PHOTOGRAPHS.

By James Martin.

Photographs, however perfect they may be, are now scarcely considered complete unless they are also carefully and appropriately mounted, either on cardboard or plate paper, so as to admit of their being passed through rolling presses, in order that they should acquire that finishing gloss which such treatment is so well adapted to impart, and which is so decidedly preferable to the polish communicated by any other means. In this respect the mounting, and the material employed to effect the mounting, of a photograph may not inaptly be regarded in the same light as the security of the setting to a costly mosaic or cameo; and in this point of view the latter, *i.e.* the nature and properties of cement or the adhesive material, will acquire no small importance in the eyes of those who value the productions which have cost them so much trouble to obtain.

The reader will readily recall to mind the fact that the materials employed for this purpose are all of organic origin, and, being so, are prone to undergo those complex metamorphoses usually known by the names of "fermentation," "putrefaction," "eremacausis," or "decay." These changes give rise to the formation of microscopic fungoid growths, minute animalcules, and to acid products; which latter, aided by air and moisture acting in concert on the delicate compound of silver, gold, and organic matter, constituting the photographic image, prove most disastrous to the permanency of the positive proof.

In view of these facts it is thought that the readers of The British Journal of Photography will consider a page or so profitably occupied in the consideration, not so much of the method of mounting photographs, as in the study of the abstract, physical, and chemical properties of the substances generally used for that purpose.

The treatment of each substance ought, I think, to comprehend a statement of the natural sources of the article as found in commerce—the method adopted either in its collection or manufacture—the extent and nature of the impurities likely to be found therein—with the means of ascertaining these points—aiming throughout the whole to indicate that substance which, by simplicity of composition and comparative permanency in constitution, seems to recommend itself to the scientific photographer as possessing those qualities best adapted for the purpose now under consideration.

The various substances which will, later, come under consideration have each been advocated from time to time, with more or less warmth, by photographers both of limited and extended experience. The writer, however, would abstain from distinctly recommending either the one or the other, choosing rather that the description given of the abstract qualities and a knowledge of principles should guide the reader in the selection of the most appropriate substance. Let us first consider

Starch, or Fecula C_{24} H_{20} O_{20}.—This is one of the most abundant of proximate vegetable principles, occurring in the form of minute white shining grains in the cells of almost every plant. Wheat, rice, and potatoes are, perhaps, the most prolific sources of this interesting body: it occurs, however, in the rhizomes of *Maranta arundinacea* (the arrow-root plant), in the stem of *Sagus rumphii* (the sago plant), and many others—sago, tapioca, arrow-root, and *tous les mois* being only varieties of the same substance, the composition as given above applying to all of them. The methods of preparation vary with the source whence the particular kind of starch is derived—the object aimed at, whether effected by mechanical or chemical means, being the disintegration of the cellular envelope and the liberation of the contained starch. In the manufacture of

Potato Starch this is effected by rasping or pounding the sliced tubers, and washing the pulpy mass on a sieve. The abundant flow of water effects a complete separation between the starch granules and the torn cellular tissue; the latter remaining on the sieve, while the former is carried through and settles at the bottom of the vessel as an insoluble soft white powder, which requires repeated washing with cold water and drying at a gentle heat.

Wheat Starch may be obtained on a small scale in a similar manner by mixing flour to a paste with water, and washing the mass upon a sieve. On the large scale, however, it is usually prepared by steeping grain in water for some time, when the lactic acid formed by the fermentation of the sugar in the grain acts as a solvent on the gluten and disintegrates the mass, allowing the starch to deposit at the bottom of the vat. There are other soluble matters, such as sugar and gum, separated in this way by repeated washing after the lactic acid fermentation, and the starch is finally collected and dried.

Rice Starch is prepared by adding a weak alkaline solvent to ground rice. The preparation of starch from this source is become an important branch of manufacture, and great accuracy is practised in making the solution of caustic soda, which, acting as a solvent on the gluten in the rice, should not contain more than 200 grains to the gallon of water. When the required action has been allowed to continue long enough to produce its full effect the supernatant liquor is drawn off; and, as in the case of potato and wheat starches, the white granular deposit is collected and dried.

As has been already stated, other kinds of starch are obtained from various sources; but the principle involved in the preparation is the same throughout, and the resulting products possess the following properties in common:—So common, indeed, and familiar is the appearance of starch, that it seems almost superfluous to allude to it in the forms of arrow-root and potato starch as a soft,

white, glistening powder, and wheat and rice starch in the form of hard columnar masses, seeming, at first sight, to possess almost a crystalline structure. This latter character, however, it does not possess, as the microscope abundantly demonstrates. Examined by this instrument, it is shown to be composed of a number of little rounded transparent bodies, having a central spot called the *hilum*, surrounded by a series of parallel rings. The relative sizes and shapes shown by the microscope—especially by the aid of polarised light—in examining starches are unfailing indications of the source from whence the sample under examination has been obtained, and in this way it can be ascertained whether the adulteration of a high-priced starch with a low one has been attempted—as, for instance, arrow-root with potato starch, or any other equally profitable sophistication.

The microscope shows starch to be composed of connected and distinctly separate globules. The method of manufacture has also shown that these globules are insoluble in cold water. If, however, *boiling* water be poured upon a mixture of starch and water, a thick glutinous mass of paste is produced (well known to every housewife), owing to the bursting of the envelope of each granule of starch. The slight opalescence possessed by the mixture arises from the presence of the enveloping membrane of each grain. Copious dilution with water will admit of the passage of this thin gelatinous starch or *amidin* through filter-paper. It is precipitated from its solution by infusion of galls, alcohol, and many metallic oxides. Tincture of iodine produces a characteristic deep indigo-blue colour, always regarded as most reliable evidence of the presence of starch.

There is something about the simplicity of constitution of starch and its freedom from natural and artificial impurities which, regarding it from a strictly chemical point of view, would seem to recommend it as a fit substance to be employed for mounting photographs; and as it cannot be doubted that the nature of the paste used for this purpose exercises an important influence on the final preservation of the prints, it cannot be altogether unprofitable to investigate the possible changes to which such preparations are subject.

In reference to the substance in question, it may be briefly stated that starch paste is prone, under certain conditions of temperature, to pass into a state of putrid fermentation, a condition forcibly indicated by its smell, in which state it should by no means be applied for mounting photographs. The precaution therefore to be adopted in the use of starch paste is always to have it *fresh*.

(To be concluded in our next.)

HOODED BACKGROUNDS.

By An Old Hand.

From the first introduction of positive portraiture up to the present time there has been much difference of opinion with regard to appropriate backgrounds, some taking the plain, others the decorated side of the question—a question open to all, and the issue a mere matter of taste. Painted walls, painted screens, calico of various shades, white blankets, brown blankets, brown paper, brown holland, paper-hanging designs in distemper, emanating from kindred imaginations, have all been resorted to with more or less success.

In the early days of portraits on silver plates, when Daguerre's process was the only one in use, an operator at Shields and Newcastle was in the habit of producing remarkably good effects by the following simple means:—A platform large enough to accommodate sitter, chair, and camera was erected in the back yard of the house, sufficiently high to command a full flood of light. Behind the sitter, and projecting overhead and at the sides for some five or six feet, was an old salt-water-soaked and storm-stained sailcloth. With this simple contrivance this operator, who had been a first-class house decorator and imitator of woods and marbles, was in the habit of producing pictures which, for artistic effect in light and shade, were immeasurably superior to any of the productions of even the reported best Daguerreotype artists of the day. A play of full, medium, or subdued light on the object was regulated by the sailcloth being brought more or less forward, and forming, as it were, a deep or shallow canvas recess. All the impressions taken with these appliances had invariably a slight tint of blue behind the figure or objects—not the dead opaque dusting of a body colour, but a bright light tint, burnt in as it were, on the plate: this tone on the background was regarded as a marvel by other professional operators, who were completely puzzled. The colour of the faces, dusted on with a tuft of cotton-wool (the method then in use), could be plainly perceived from the deadening of the polish of the plate; while the back, in addition to the unmistakeable tone and tint of blue, had all the metallic lustre of the bright silver surface. This is mentioned in order to show and prove that the effect of light and shade, imparted to groups and objects taken by the camera, is not by any means a new contrivance, but was known and in use long before the discovery and introduction of collodion.

The following method of preparing and arranging the studio and operating-room will be found to yield the same kind of effects, with the addition of more variety in the character of the backgrounds themselves, as they may be repeatedly changed at the will of the operator:—The first articles necessary are three open frames made of three-quarter or inch deal—one frame ten feet high by seven feet wide, the other two five feet wide by ten feet high: the larger frame to have the narrower ones hinged to it, one on each side: each frame to be covered with brown holland, tacked on to within an inch of the outside edge, and then the holland pasted or glued down close to the edge, and, when dry, pared off clean with a sharp knife. If the frames are hinged with a rule joint top and bottom, and coloured black at the backs, they can be turned and will open either way, and thus answer a double purpose. To the centre or broadest frame should be tacked a piece of black thick calico, five or six yards long and two yards wide, fastened along the full width of the centre frame, leaving two loose five feet ends to hang over the sides right and left. Some pieces of lead sewn to each corner of the ends will keep this top or hood cloth steady in its place when the side wings are fixed at the desired angle. If the room is sufficiently high, a frame covered with holland and coloured black on the under side may take the place of the top cloth, and can be raised or lowered as needed; if, on the contrary, the space is confined, two lines or rods can be carried the length of the room, and a dark cloth thrown over to form the recess, taking care no light enters at the top or back edges. With this simple arrangement, and placing the sitter or object more or less in the recess, shadows softly slight or deeply intense may be produced. For *carte-de-visite* subjects this plan is peculiarly adapted, and in the hands of any one with a good eye for effect will yield very satisfactory results; and, if it be desirable to add to the above arrangements fittings, furniture, and a choice series of inexpensive ornaments, combining beauty, utility, and good taste, there is nothing to be compared with *carton pierre*, an article extensively used in the decoration of French theatres and ball-rooms. *Carton pierre* is a composition of clay, paper, oil, and gelatine mixed in certain proportions, and then moulded into the required form. Wall panels and subjects in relief may be seen in the Great International Exhibition, and prove its fitness for the purposes here mentioned, while its cheapness will enable the majority of professional photographers to supply themselves with good imitations of objects of art and decoration when costly carving and sculpture would be unattainable. One of the characteristics of the present age consists in the revival of those ornamental forms that were once common throughout the land. It is quietly, step by step, creeping into each English home, both high and low, and entirely superseding the line-and-rule forms of the last age, and will eventually be adopted by all who have any regard to taste, completely superseding pasteboard ornaments and stage profileism.

DALLMEYER'S STEREOSCOPIC APPARATUS.

By Dr. D. van Monckhoven.

Dr. Monckhoven has in course of preparation the fourth edition of his *Traité Général de Photographie*, in which he purposes describing all the best forms of apparatus.

The learned doctor is particularly pleased with the stercoscopic apparatus lately introduced by Mr. Dallmeyer, and knowing well the gratification experienced by inventors in finding that their efforts are appreciated, he has, with that readiness to acknowledge merit which so amiably distinguishes him, *requested us to insert his description of the apparatus in question* in this Journal—a request to which we readily accede, especially as the illustrations will, no doubt, be acceptable to many of our provincial readers, who have fewer opportunities of seeing for themselves the varieties of apparatus introduced from time to time.

We now give place to Dr. Monckhoven, who says:—

Mr. Dallmeyer's stereoscopic apparatus has already for some time enjoyed well-merited success both in Germany and England. It is with this instrument that the instantaneous views of the Boulevards of Paris were taken by MM. Ferrier and Soulier.

Everybody acknowledges Messrs. Dallmeyer, Morz, Secretan, and Voigtländer as opticians of the first rank in Europe. We understand by the word optician not a mere mechanic, but a man acquainted with theory and practice, who does not arrive at perfection by groping in the dark, but possessing sufficient ability to create designedly an instrument that his practical skill can ultimately develop at length to something approaching absolute perfection.

Having learnt through the English journals that Mr. Dallmeyer had made considerable improvements in the binocular stereoscopic apparatus, we lost no time in procuring one of his manufacture, and the result of our experience therewith has been so satisfactory that we have caused illustrations of the apparatus to be produced, persuaded that a minute description thereof will be of use to those who have not had an opportunity of examining it.

FIG. 1.

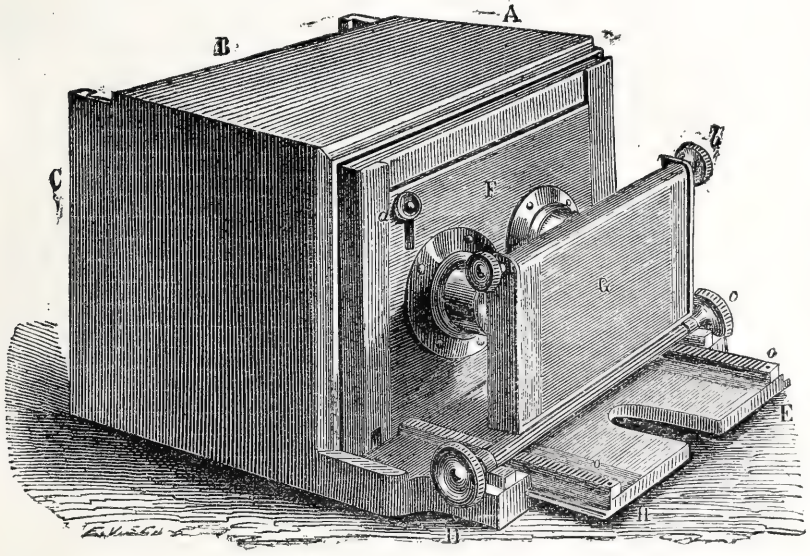
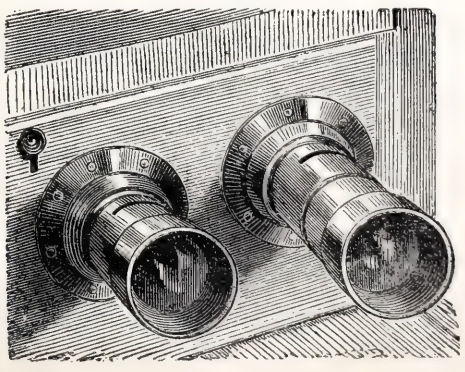


Fig. 1 shows the entire apparatus A B C D, representing the body of the camera, made of polished mahogany: the angles are protected with brass corners, to protect it from injury by heat, &c. The camera is attached to the tripod by means of a nut and screw. At the back B is the ground-glass (not shown in the figure), and this part of the instrument is made a fixture, as being more convenient, when focussing, than the ordinary method of construction. The front part F, carrying the objectives, is made to adjust by aid of the racks *o o* and pinion *c* attached to the base E, which is united with and forms part of the moving portion of the camera, whilst the pinion *c* is attached to the lower prolongation of the dark chamber A C. The focussing is therefore a simple operation.

Whilst examining the image on the ground-glass the pinion *c* is turned by hand. The piece F which carries the object-glasses can be raised or lowered at will, and fixed by the nut *a*.

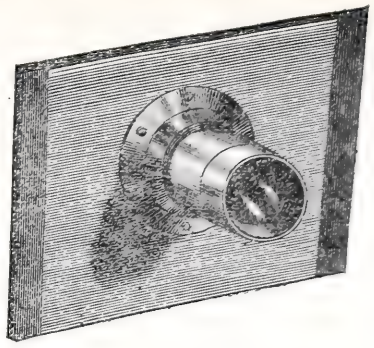
When it is desired to remove this sliding-front, the object-glasses are to be first of all drawn out, as shown in the right hand one of *fig.* 2.

FIG. 2.



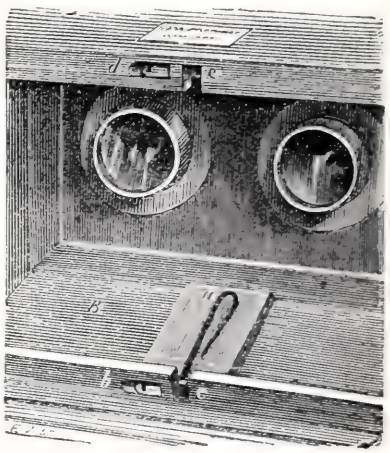
This front can be replaced by another, which carries the triplet objective. (*Fig.* 3.)

FIG. 3.

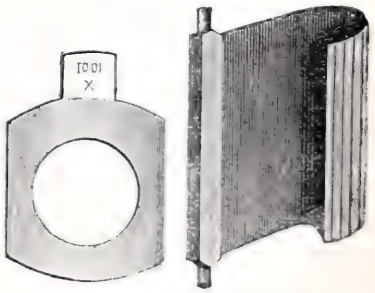


The inside of the camera (*fig.* 4) is ingeniously arranged. When using the two objectives it is necessary to separate the two images by means of a diaphragm; but, on the contrary, when employing the camera for groups or single views, this diaphragm should be capable of removal. To accomplish this end the diaphragm is made pliable (*fig.* 6), and fits into the groove (*a fig.* 4) belonging to the moving part B of the camera. By drawing the bolts *b* and *d* on the fixed part of the camera, it will be readily perceived how, when lengthening and shortening the camera, the pliable diaphragm accomodates itself to these movements, always separating completely the interior into two distinct compartments.

FIG. 4.

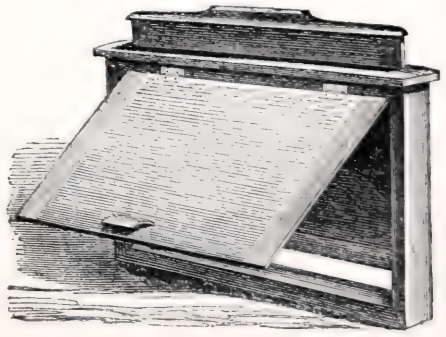


FIGS. 5 AND 6.



The sliding back (*fig.* 7) carries a plate seven and a quarter inches by four and a half inches, and is furnished with a plate-holder (*fig.* 8) for stereoscopic sizes, the corners being as usual of silver wire. We advise the use of glasses of the larger size even for stereoscopic subjects; for, though larger than needful, a margin is left for defects which usually occur at the edges, and the same sized plates are of service when the triplet object-glass is employed.

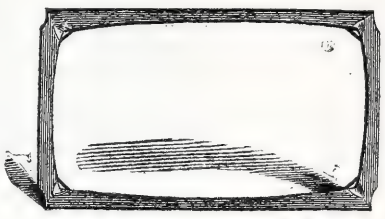
FIG. 7.



The sliding back (*fig.* 7) is deserving of particular notice, from the ingenious contrivance for withdrawing the excess of nitrate of silver, as shown in *fig.* 9. The silver wire *a* steadies the plate which rests also at *c* on its extremity only. The nitrate of silver which accumulates runs down the groove *b* coated with wax; and

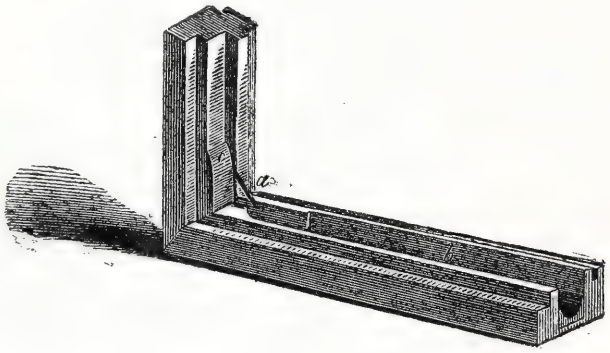
even when using the smaller plate-holder (*fig.* 8) the liquid can only run down into the groove. It is an ingenious arrangement, which we commend to the cabinet makers. The camera is capable of extension from three and a half to seven inches.

FIG. 8.



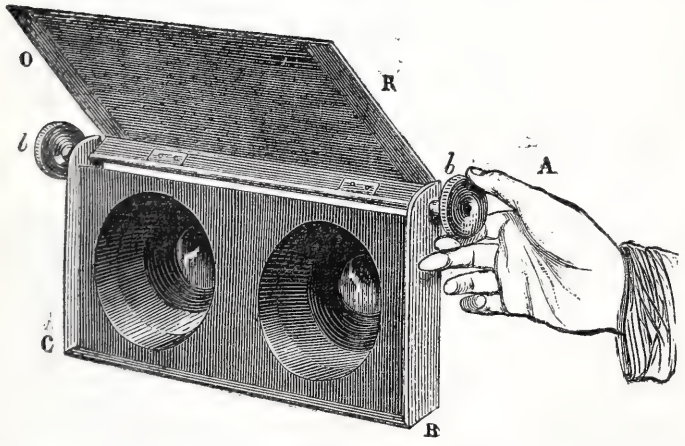
The objectives carry on their outer shades an instantaneous shutter, consisting of a simple board, which is shown in *fig.* 1 as closed, and as open in *fig.* 10. The part C B is attached to the objectives: it is of polished ma-

FIG. 9.



hogany. A hinge furnished with two milled heads of brass, *b b*,

FIG. 10.



carries the shutter O R. One great advantage of this shutter is that the sky is less exposed than the lower part of the image: thus it is easy to obtain an instantaneous view in which the very clouds themselves are represented. Some skill is requisite in manipulating this apparatus. We apprehend that in opening and closing the shutter a movement is liable to be communicated to the plate, and it is needful to possess both skill and coolness in its use. This part has not our entire approbation, and we are convinced that a better arrangement can be found.

We now come to the lenses, which are double combinations of 1¼ in. and 1½ in. opening, and 3½ inches focal distance from the back part of the combination. *Fig.* 2 shows the opening where the diaphragms are placed, one of the latter being represented in *fig.* 5. These diaphragms are numbered and so arranged that each one when in use involves an exposure twice as long in time as is requisite with the next larger one, that marked with X excepted. These lenses can be used with their entire aperture, and we were quite delighted with them on the first occasion when we examined them. We focussed a tree situated about ten yards from the lens, and the background of the landscape located about a mile and a half behind was still perfectly sharp. In a second experiment we focussed the same tree at the same distance, and the people who passed between the tree and the lens were all depicted with a distinctness truly satisfactory.

That which the English call "depth of focus" is, then, here admirably attained. *As double lenses for views*—that is to say with definition and intensity of light united—we have never seen any which have been comparable to them.

The employment of diaphragms permits the use of the same lenses for reproductions and for enlargements, which require great delicacy. Already this end is attained with a diaphragm of medium size, and they have one great advantage over ordinary single lenses in admitting of greater correctness of the lines and much more light.

DRY COLLODION ON PAPER.*

A NEW edition of M. Marion's *Practice of Photography on Paper* is now in course of publication; and, as it has been enriched by a new and very interesting chapter, we have thought that our readers would gladly be made acquainted with its contents.

Among negative processes, that on dry paper is alluded to in many good treatises on photography as destined to a brilliant future; such is also the opinion of many distinguished amateurs who are successfully practising the processes known as waxed-paper, turpentine-waxed paper, or paraffine paper. Being ourselves fully impressed with the truth of these opinions, and impelled also in that direction by the nature of our business, we have continually sought for means of giving to paper greater rapidity and more delicacy.

We believe we have attained this result by a mixed process, collodion and paper, which we propose now to make known for the first time.

The application of collodion to paper has the advantage over collodion spread upon glass of being easier of manipulation, and more certainly and constantly successful; besides which it gives greater relief to the figures. The advantage which it possesses over waxed-paper we have alluded to above: it consists in greater rapidity and delicacy, with the same facilities of operation. Tourists will find, in adopting the use of collodionised paper, the united advantages of several processes on paper and glass, without any inconvenience: they will be able, as with waxed-paper, by supplying themselves with our preservative portfolios, to carry into the field a great number of sheets provided with all the elements of sensibility, and ready to receive the luminous radiations.

Our secret consists in incorporating the collodion with the paper, and in forming with the two substances a more sensitive, compact, and homogeneous surface, and of converting it—if we may so express ourselves—into a harder kind of felt.

The following is the formula of the collodion which we apply to the paper:—

Rectified ether	1,000	parts.
Soluble cotton	10	„
Ceroline	1,000	„
Iodide of potassium	20	„
Bromide of potassium	5	„
Iodide of cyanogen	2	„

After the iodides and bromides are dissolved we add 21 parts of pure ammonia.

In order that the solution of the iodides and bromides shall take place without difficulty they should previously be reduced to powder in a mortar. After solution, filter, when the collodion will be ready for use, although it will be better to let it stand for four-and-twenty hours. The whole of the contents of the bottle should not be poured into the dish at the time of using, the deposit which it contains being likely to prejudice the result. For those who would avoid the trouble of making the preparation, we have manufactured not only the collodion, but also the collodionised paper.

The collodion, after being allowed to deposit, and after being filtered, is poured into a porcelain tray, and into this the selected sheets of paper are plunged. We would recommend No. 530 of our catalogue.

It is not necessary that the dish should be as large as the paper: sheets measuring 23 × 18 may be collodionised in a dish not larger than 18 × 12. The following is the method of proceeding:—The sheet is held by the two extremities: one end is immersed in the liquid as near as possible without dropping it, and while with the right hand the paper is drawn towards the operator, the left hand makes an opposite movement, and lowers the sheet gently, forcing it at the same time to penetrate the liquid—the right hand continually drawing the sheet through the collodion by its anterior edge. When the posterior edge just grazes the liquid, the left hand releases its hold and comes to the assistance of the right hand in entirely withdrawing the sheet, which is now completely saturated with collodion, with the exception of the small border in front, which remains dry and white, and by which the sheet is hung up to dry.

* From *Cosmos*.

The paper is removed while it is still moist, and it is preserved in that condition until just at the moment of sensitising, having previously passed it into the cylinder. It improves by keeping; and we can state that it is not until one month after preparation that it is susceptible of giving good proofs.

There is no alteration in the method of sensitising, developing, and fixing. The proportions for the aceto-nitrate bath are:—

Water	100 parts
Nitrate of silver	7 „
Acetic acid	10 „

The gallic acid, for development, should be a saturated solution, to which has been added a few drops of fresh solution of nitrate of silver. The hyposulphite of soda for fixing should be made with water 1,000 parts, hyposulphate of soda 400 parts. Indeed a saturated solution may be safely employed, since far from enfeebling the high lights of the negative proof—as happened in the old processes—hyposulphite imparts to them, on the contrary, a greater intensity without vitiating the whites, *i.e.*, the shadows.

Let us observe, also, that after sensitising it is necessary to wash abundantly in rain water, and that after this it should be carefully sponged, or rather pressed between two folds of blotting paper, which should not be used again for this purpose, but which may nevertheless be made to serve for ordinary drying purposes. Moreover, the drying of the collodionised and sensitised paper should be expedited by changing the blotting paper frequently; and when it is almost dry it should be placed in the preservative case, which will completely absorb the remaining moisture. Paper thus enclosed will keep for several days; but as far as possible we should recommend no more to be prepared than will meet the requirements of the occasion. We refer to Chapter V. of this work for the directions to be followed in the series of operations necessary to the production of a negative proof; and as the method of sensitising is not yet given, we will reproduce it here with all necessary details.

The aceto-nitrate of silver bath is poured into a flat porcelain or glass dish, and when all air bubbles have disappeared the collodionised paper is floated thereon, taking care to avoid the production of fresh air bubbles. It is gently raised by the corners in order to assure the operator that contact between the paper and solution is complete over the entire surface; and when the evidence on this point is satisfactory the paper is forced underneath the liquid by means of the stalk of a quill from which the feathers have been pulled off. It very soon changes from the colour it possesses, and becomes almost white, by the transformation of the iodo-bromide of potassium and cyanogen into iodide of silver. Small air bubbles will make their appearance on the upper surface of the submerged sheet. It is very necessary to remove these as fast as they show themselves. The stalk of a quill pen, with the feathers pulled off, is, on account of its elasticity, the thing which we have found answer best for the purpose. When the paper has become quite colourless, it is taken out, drained, and thrown into a dish partly filled with rain water. Several sheets may be washed together in the same dish; but more than one sheet should never be sensitised at a time. Plenty of water should be used, and great care exercised in the washing. We have already described the method of absorbing the moisture from and drying the paper.

Our process of negative collodionised paper depends, as will be seen, on the introduction into the collodion of wax and ceroline, which imparts a greater aptitude to combine with the paper, and also aids its preservation in the dry state after sensitising. Without the addition of these substances and of the iodide of cyanogen the collodion will not unite so intimately with the paper: it will infallibly become detached in one or other of the numerous immersions to which it is submitted before the proof is completely finished.

The negative fixed, washed, and dried, should be waxed; although, when the negative is weak, we have found it advantageous not to wax it.

We ought not to omit mentioning that the collodion after serving for a number of sheets becomes thick, which necessitates its being mixed with some thinner collodion in order to restore it as near as possible to its normal condition. This addition of weak collodion should be made when the collodion already in use fails to penetrate the paper and leaves on its surface small glutinous patches which are slow in drying. It is difficult to fix beforehand the proportions in which this admixture should be made. Experience alone can guide the operator; and our process is so new that we cannot speak with precision on this point.

CABINET PICTURES.

Photographed by Ernest Edwards.

We have been favoured by Mr. Ernest Edwards with some specimens of his photographic skill, accompanied by the request that we should criticise and report on them in the pages of this Journal in the ordinary manner, altogether regardless of his position as an amateur. On looking over the subjects received we find scarcely a single one that has not already attracted our notice on a former occasion, when assisting at the selection of the prize pictures of the Amateur Photographic Association; and this is not surprising, seeing that they possess generally the merit of artistic as well as photographic excellence. What can be more charming as a study than The Cloisters of Netley Abbey? The shadows deep, yet transparent, and full of detail—the half-tones mellow—the rough stonework of the ruin rich in chequered light and shade cast by the sunbeams passing through spaces in the other parts of the building, and broken and rebroken by the irregularities of surface upon which they fall.

The Side Aisle of Netley Abbey is another gem in which all the qualities named in the preceding are to be found, with the addition of well-executed foliage; ivy trailing over the arches and columns in soft and harmonious delicacy—not spotty and hard as is too often the case; the cast shadows also beautifully transparent; and the whole subject finely broken up in outline without confusion. There is a fault—though but a slight one—a little leaning inwards of the perpendicular from tilting the camera; not very perceptible, it is true, on account of the form of the arch at the upper part, but still discernible by a critical eye.

The East Window, Netley Abbey, is equally good as a photograph, very beautiful in itself, but rather too formal, owing to the point of view having been too directly at right angles to the centre of the window. In this picture the ivy clustering about the tracery of the window is exquisitely rendered.

Of Whippingham Church, Isle of Wight, we have nothing to say in praise, regarding either the subject or its treatment artistically. An incomplete structure, with unglazed windows, and not devoid of numerous scaffold poles and such like surroundings, is not exactly adapted for poetical treatment. Nothing could have been expected of it in this way, and we are bound to say that no disappointment has ensued. Of the manipulative skill there is no lack, and we only regret that it should have been applied to the delineation of so uninteresting a subject.

The curious excavation in the natural rock, known as Anchor Church, Derby, embowered in masses of foliage, is rather an object of curiosity than beauty. It has evidently been taken in a bad light, and the effect is consequently sombre and rather flat: still by those who have visited the spot it will no doubt be prized.

The Cleft in the Rock, *Anchor Church, Derby*, is at least as brilliant as its companion is tame. It is one of those multiple clefts so common in Derbyshire, where huge slices of the rock seem to have been selected and hewn out by nature ready for removal, and then left to have their angles rounded by the wearing of the elements, and to be converted into things of beauty by the graceful overgrowth of an abundant vegetation. Ferns and brambles, heaths and creepers, little angular stems and graceful festoons, unite to adorn the rugged features of the rocky masses glowing in the sunlight—each receiving an access of elegance from the contrasts presented, just as the furrowed and wrinkled visage of a benevolent old patriarch looks still more benevolent when surrounded by the smiling faces and waving locks of a bevy of fair grand-daughters. This is truly a charming picture in every sense of the word.

There is considerable merit in a landscape entitled The Hamble, Bursledon. The distance appears really distant, with a due proportion of atmosphere. The foliage is good, though perhaps a trifle too dark. The water is the weakest part, reflecting the light of the sky rather too directly and exclusively, and a vessel afloat is somewhat indistinct from movement. But, even with the failings indicated, it is a production of which not a few professionals would be proud.

An instantaneous view of a Steamer at Ryde Pier is deserving of high commendation. The vessel, as also a brig in the distance, are sharp and clear as can be desired; the waves, too, are natural; and though the nearer parts of the pier itself are out of focus, the subject has been carefully and judiciously vignetted in the printing; thus the little defect is subdued to a minimum, and the treatment adopted the most appropriate that could have been selected.

Vignetting has also been resorted to with two others of the specimens before us, and in both cases most judiciously. In one, a somewhat commonplace subject—King's College, Cambridge, from the Back—has been made picturesque by this means; and in

the other—the STATUE OF SILENCE, in the Fitzwilliam Museum, at Cambridge—the value pictorially has been materially enhanced.

THE SHIELD OF ACHILLES, in the same museum, shows what Mr. Edwards can do in the still-life direction. Each effect of the play of light on this splendidly embossed work of art has its full value.

Lastly, we must not omit to notice a *very fine interior*, about five inches by four inches in dimensions, without label, but which is evidently an extensive library stretching away in long perspective, adorned on either side with numerous busts, the vista culminating in a full-length statue. This is a very successfully-executed specimen of a difficult class, soft and delicate in reflected light, and altogether an unquestionable witness to the skill of its producer, who can well afford to have waived his privilege as an amateur to be dealt with gently, and who would, even as a professional operator, take rank of no mean order. We can honestly congratulate photographers in having Mr. Edwards amongst the fraternity.

ENLARGEMENTS FROM SMALL NEGATIVES.

Photographed by W. H. WARNER (of Ross).

London: H. S. Warr, 63, High Holborn.

OF all photographic enlargements that we have hitherto seen there are but few that equal Mr. Warner's specimens, when regarded simply as photographs, unaided by the pencil of the artist; for not only do they excel in definition, but the preservation of half-tone is superior to that generally attained in the enlarged reproductions.

It is true that the increased dimensions are not excessive, being in general about three diameters. It is true, also, that the definition is not equal to that which might possibly be obtained by taking the original negative of the larger size. But it is unquestionable that the convenience of taking negatives of stereoscopic size for pictures of nine by seven inches is very great, and involves other advantages in addition; and it is by no means certain that the extra definition of some parts of the subject that it is possible to be secured would add to the value *as works of art*.

Mr. Warner, at a late meeting of the Photographic Society (London), explained that his mode of operating agreed generally in principle with that described by Mr. Vernon Heath, and we endorsed the correctness of the statement. The proofs before us fully justify the accuracy of the views enunciated.

Amongst the specimens before us are the REREDOS at HEREFORD CATHEDRAL, in which the subject of the sculpture in each compartment is very effectively given, the whole forming a capital study—the WATER GATE, RAGLAN CASTLE—TINTERN ABBEY—FONT AT KILPICK CHURCH, HEREFORDSHIRE—WOODBINE, a Study—and "NIGGER" BOYS;—all from stereoscopic negatives enlarged about three diameters.

We understand from Mr. Warner that he undertakes, as a matter of business, to produce enlarged negatives for amateurs and professionals. The specimens received are duplicates of those lately in the International Exhibition which were spoilt by the damp walls. Certainly those before us exhibit no signs of fading.

COMMEMORATIVE PHOTOGRAPH,

Illustrative of the Manchester Meeting (1861) *of the British Association for the Advancement of Science, under the Presidency of William Fairbairn, Esq., LL.D., F.R.S., &c.*

Designed and Photographed by A. BROTHERS.

London: Day & Son, Gate Street, Lincoln's Inn Fields.
Manchester: A. Brothers, 14, St. Ann's Square.

WE have had historical painters, and why not historical photographers? Certainly, if accuracy of delineation be a point of importance, artists of the latter class have a much greater chance of permanent occupation than the former. Already the initiative has been taken, and the specimen before us bears internal evidence that it will not be a solitary specimen of its kind, for the simple reason that it is a highly successful experiment.

We learn that the original picture of which that before us is a copy was designed and executed by Mr. A. Brothers, by commission from Dr. Fairbairn, President of the Association for the year 1861, who was, no doubt, desirous of preserving some record of his most distinguished colleagues; and it was a happy thought of Mr. Brothers to combine the portraits into a very pleasing group located in an apartment of the President's own residence, at Ardwick. But, in order to effect this, considerable ingenuity had to be exercised; for it would have been manifestly impossible to have collected together the two-and-twenty persons composing the group in such a manner as to have allowed of their being successfully photographed, supposing all to have possessed the almost superhuman power of remaining perfectly quiescent for a sufficiently long time together under the conditions that would have been requisite. The plan adopted was, therefore, that originally introduced by Mr. O. G. Rejlander, of printing portions of the composition from many different negatives, and in the case before us this involved no less than forty separate printings for the original picture, which was 19½ inches in height by 33 inches in breadth. It will, therefore, at once be perceived that the artist had to contend with no ordinary difficulties in carrying out his design; for, apart from the mere printing, each portrait, though taken separately, had to be arranged in such a manner as to harmonise with all the others, to bear its relative size in accordance with the position it was intended to occupy in the group, and yet to be in attitude and general arrangement characteristic of the individuals. None but those who have made the attempt can rightly appreciate the labour involved in a task of this kind, in which the mere attainment of accuracy in artistic requirements of light and shade is no small triumph to have achieved. The whole grouping is well managed—each portion, as it were, leading up to the principal figure (that of Dr. Fairbairn)—and the lines well balanced; no straight row of heads in any direction, and, as a rule, the attitude of each individual natural and easy—the least so being that of Mr. Curtis, the Mayor of Manchester, whose chain and badge of office probably imposed some constraint upon his freedom of pose. That some minor defects might be pointed out we are ready to admit—as what human work can be free from them?—but too much praise can hardly be accorded for the very great degree of both artistic and manipulative skill that has been judiciously exercised in the production of so interesting and valuable a record. The original picture having been completed, a negative of a reduced size was taken, being 9½ inches by 15½ inches, from which the proof under examination wa printed; and we have little doubt that an extensive demand for copies will arise, especially amongst the members of the British Association for the Advancement of Science, when they learn that they are obtainable.

The group consists of likenesses of the Chairmen of sections and office-bearers for the year 1861. In conclusion, we cannot do better than give a list of the names, in order that our readers may be able to know what an interesting portrait gallery is within their reach.

The portraits are those of the following gentlemen:—J. F. Bateman, C.E.; Sir R. Murchison, F.R.S.; C. C. Babbington; Rev. W. V. Harcourt; Rev. T. R. Robinson, D.D.; R. D. Darbishire; Sir David Brewster, K.H., F.R.S.; Alderman Neild; Professor Airy; Lord Wrottesly, F.R.S.; General Sabine; Joseph Heron; Professor Miller; M. Curtis (Mayor); Alderman Mackie; Wm. Newmarch; Wm. Fairbairn, LL.D., F.R.S.; Professor Hopkins; Professor Sedgwick; John Crawford; Professor Willis; and Professor Phillips.

STEREOGRAPHS.

The Inundation in the Fens.

Photographed by VALENTINE BLANCHARD.

London: C. E. Elliott, 5, Aldermanbury Postern, City.

A CALAMITY such as that which lately befell an agricultural district in Norfolk by the bursting of a sluice is one not easily to be forgotten, nor is the interest concentrated upon the submerged district confined to the suffering inhabitants alone; for, apart from natural sympathy with those who are literally washed away from their homes, there was considerable excitement but recently existing relative to the question whether the engineering skill engaged in attempting to repair all the mischief which ensued would prove equal to the task involved, and for some time the issue appeared to be extremely doubtful, several failures in attempting the damming out of the water of the German Ocean having been experienced before success was achieved, so far as to prevent the repeated irruptions which had occurred at every successive high tide since the catastrophe.

Of course until this important first step was gained, no possibility existed of the release of the flooded district, extending over an area of about six miles in length and four miles in breadth, from the domination of the waters; but, this once attained, the remainder is but a work of time.

It was a happy idea of Mr. Blanchard to secure such incontrovertible witnesses of the devastation as the series of sterographs now before us. They will tell their tale of truth when time sufficient shall have elapsed to make oral or written testimony liable to the

suspicion of exaggeration; and for this reason many having a personal interest in the calamity will be glad to avail themselves of the opportunity now offered of securing some at least of the specimens. But these will not be the only claimants for them; for unpromising as such a class of subjects would at first sight appear to be when regarded with an eye to the picturesque, yet under the influence of Mr. Blanchard's skill as an operator for "instantaneous" effects, and as viewed by his camera, they certainly do exhibit artistic excellence in a very considerable degree. For instance:—

No. 150 (SUNSET AFTER A STORM), displays a wild waste of waters roused into a miniature sea by the wind, the wavelets tipped by a golden glow of light streaming from under the rugged masses of stormy-looking clouds. A solitary boat, with a mast around which the sail is brailed up, with two passengers, floats in the middle distance, and, far away at the horizon, trees and buildings are just dimly seen, breaking the monotony of the line, while in the foreground a post and a couple of rails stand out of the water, testifying to the shallowness of the temporary ocean. The boat's motion has a little marred the sharpness of this specimen.—Again:

No. 156 (A VIEW LOOKING TOWARDS SMEETH-ROAD STATION, SUNSET) is something more than the name alone implies. In this we are looking across a narrower portion of the lake. The waters are tranquil, and evidently very shallow, for the long grasses show their more aspiring heads above the water in two or three series of lines. On the left foreground is a boat in full sail, sharp and distinct as can be desired, containing a couple of men. In the middle distance are three or four haystacks standing partly out of the water: beside them a boat is being rowed away from the spectator, the oars stretching right and left. A long strip of land to the left stretches half-way across the distance, interrupted by but a single house, while the other half of the background is well broken up with houses and elm trees, lopped in the barbarous fashion so common in our hedgerows. A few light clouds bestrew the sky, and behind one the sun has partly sunk down, leaving about three-quarters of its orb visible though slightly veiled, and this is "led up to," as it were, by a slight additional strip of light upon the water. It is a charming slide, full of atmosphere and picturesque effect.

THE VIEW FROM THE MIDDLE LEVEL BANK (No. 151), with the METHODIST CHAPEL in the distance, shows a farm-house and homestead, rendered untenable by a couple of feet or so of water in the basement. The straw-yard enjoys just sufficient elevation to afford a dry footing; and here are a couple of youths in conversation—one sitting on the railing, the other standing opposite to him, with the skirt of his coat blowing out in the wind.

NEAPS FARM, EVENING (No. 148), is very characteristic of the scene. A square unpicturesque-looking house standing in the water, which reaches up to just below the lower window-sill, is backed by a barn and surrounded at some little distance by trees and hedges, showing above the water, while a boat with five persons in it has just *sailed through* the nearest hedge. The land is seen just like a thin line across the water in the distance.

No. 152 shows THE BROKEN SLUICE—the shattered remains of the frail protection against the waters of the sea.

There are several excellent views of the COFFER DAM, in which may be seen the "navvies" at work throwing in the bags of clay, the pile-driving engines, blocks and pulleys, engineers superintending, panels being slid into their grooves, waters surging and foaming through the openings, displaying scenes of bustle and animation which few could look upon without interest. Two of these are especially excellent:—No. 153, in which a group of celebrated engineers is comprised; and No. 155—that in which there are three men in the foreground (for there is another slide bearing the same number and description though quite a different scene). The one to which we particularly allude is most admirable as a photograph, of great interest to engineers, harmonious and full of detail and half-tone, clear, distinct, and effective.

Appended to each slide is a short extract from *The Times*, descriptive of the scene of the inundation, and written in the month of June last, which, as an appropriate conclusion, we may with propriety quote. It is as follows:—

A brief description of the present inundations may not be considered out of place here. A glance at the map of England will show an immense district lying between the hilly parts of Norfolk and Lincolnshire, and extending across the northern parts of Cambridgeshire. This large area is intersected in various directions by drains or artificial rivers, the object of which is to carry off the superabundant water into the natural or tidal rivers. A hasty glance at this district, during a rapid journey by rail, will at once reveal its noteworthy characteristics. A vast plain presents itself to the eye, with nothing to break the monotony but an occasional farm-house, or a row of stunted willows, with here and there the tall shaft of some engine busily employed in throwing the water from the drains into the regular channels leading to the rivers. The whole of this district has been reclaimed from the sea in comparatively recent times, and as, consequently, it is all below high water mark, the outlets into the rivers are guarded by sluices that have hitherto been considered models of engineering skill. They are constructed to let off the upland waters, but to prevent the tide from entering. The cause of the present calamity is the bursting of the latest of these magnificent erections—the sluice built at St. Germains, where the middle level drain empties itself into the Ouse. This drain was formed some sixteen years ago, to carry off the water of an inland sea called Whittlesea Mere, and has been so successful in its operation that the whole area of the old sea is now under cultivation. The scheme was however strongly opposed by the landholders in Marshland Fen, the scene of the present inundations, for the drain came across their lands, putting them to serious inconvenience without any corresponding benefit, for it did not drain their land in the slightest degree. At the time of the formation of the drain, we remember an old man saying, "They will have no difficulty in draining Whittlesea Mere, but the day will come, mark my words, when they will have a Marshland Mere instead." This prediction, though laughed at at the time, has now come to pass; for, on the breaking of the sluice which guarded the outlet, the tidal waters rushed into the drain and filled it from bank to bank. Every one saw that the banks could not sustain the extra pressure; for the drain was in the position of a basin, so full that another drop must make it run over. At the weakest point, accordingly, the water spurted through like the stream from the hose of a fire engine, and in a short space of time there was a gap a hundred feet across, and a torrent of water rushing over the unfortunate land; and a district of six miles long by three and four broad, which a few weeks ago might be considered as the most fertile in England, is now a salt water lake four feet deep.

PHOTO-MICROGRAPHS.

WANT of space compels us to postpone a notice of some very excellent examples of photographs of microscopic objects taken by Dr. Maddox, in connexion with whose name our readers will remember the singular discovery of living *Acari* found in the nitrate of silver bath. We may for the moment, however, state that numerous excellent negatives of these interesting objects were taken by Dr. Maddox; that these negatives are now in the custody of Mr. Baker, philosophical instrument maker, High Holborn, London; and we understand that he has authority to print, and supply the public with, proofs from these negatives. We purpose giving a more detailed notice of them in our next.

A VISIT TO LONDON AND THE EXHIBITION.

By A SCOTCH PHOTOGRAPHER.

WITH pockets well filled with metropolitan guide-books and maps, together with light literature, sandwiches, and other Scotch comforts for the journey, away I started per night express train for London.

Now, when a Scotchman makes his maiden visit to the metropolis every object on the journey is possessed of interest; accordingly, when morning light revealed the country through which we were being so rapidly whirled, I found myself comparing the aspect of "merry England" with that of its more northern sister kingdom. It must at once be obvious, even to the most cursory observer, that harvest operations are in a much greater state of forwardness than in Scotland; but, to one accustomed to look upon nature in her more rugged and sublime aspects—to see hills, glens, torrents, and lakes all gloriously intermingled—here wild mountains and there smiling hamlets—to such an one the contrast between these and the flat, scarcely undulating, richly-clad fields and placid rivers of England is very great.

Arriving in London about mid-day on Sunday, one or two things somewhat surprised me: chief among these was the comparative fewness in number of the shops which were open. Without entering into the theological aspect of the question, it may be remarked that I had expected to see, if not a majority, at least a large number, of shops open pursuing the ordinary course of business; but, with some few exceptions, they were shut, and business appeared suspended.

The drinking customs of the English metropolis on Sunday evening seemed extremely unlike those of Scotland, where, under the exercise of a stringent Act of Parliament, no public-houses are allowed to be open on that day, but where, nevertheless, in spite of this barrier, numerous cases of inebriation, in every stage, may be seen at all hours on the Sunday—this, of course, being the result of secret tippling. In London, on the contrary, no attempt seems to be made to hide Sunday evening carousals, as the crowded benches *outside* of many of the public-house doors testified. The most noticeable feature in connexion with this matter seemed to be that, among all the open and avowed drinking, I did not see a single drunken person during my stay. How is this? In Edinburgh, where the strong arm of the law is supposed to have taken care that all the sources of supply are shut, a stranger going on Sunday through certain portions of the town, either morning or evening, cannot fail to meet with many deplorable cases of inebriety. A solution of the problem has been offered to me. It is this:—In London the staple drink on Sunday evening is ale and porter, and, according to my informant—an old Scotchman, long resident within the sound of Bow bells—"London yill is just ditch-water, compared to Edinbro' yill: a bodie might drink it till they burst, without being fou'. It's grand for slockening the drowth; but it gangs nae higher up than the stamach."

There is a dry collodion process well known in some districts of Scotland, in which ale plays the part of the preservative varnish. A London gentleman once told me he had not found it succeed to his satisfaction. Might I suggest that real Scotch ale is as unlike swipes, and as superior to it for this purpose, as Smith, Beck and Beck's eighth-of-an-inch microscopic object-glasses are to a French two-and-twenty shillings one. It is *nomen et preterea nihil.*

Before describing who and what I saw in general in London, it may not be amiss to devote a short time in making some remarks upon the great subject of the day—the Exhibition. It shall be my endeavour to give my country brethren my sentiments on the subject as impartially as I can; and if my opinions run counter to those already expressed by competent judges (as I know they will in many instances), it must just be attributed to my want of knowledge, and not to their incapability of judging. I doubt not that a longer residence in London would have so elevated my taste that I might have perceived many beauties in objects in which, at present, I confess to have discovered none. A little education of the taste sometimes alters it very materially. Some people are said in course of time to get their musical taste so highly cultivated as to prefer the Highland bagpipes to the finest orchestra; and it is quite possible that a longer stay in the metropolis might have altered my taste too. In connexion with the Exhibition, I might eventually have been enabled to appreciate a piece of literature for which I honestly confess I have not language at command adequately to express my present opinion—I mean the "Official *Illustrated* Catalogue," the seventh part of which, comprising Classes XIII. to XVII. inclusive, is at present before me. It contains philosophical, photographic, horological, musical, and surgical instruments, processes, and appliances. Now, turning to "Photography," let us see what is out of keeping with the most ordinary taste. Pages first, second, and third contain on an average eleven entries, one or two lines being generally devoted to each, except where particular explanations are entered into, as in the case of Burnett and two or three others. Let one such entry suffice as a specimen:—"[3065]. Cramb Brothers, *Glasgow.*—Photographs on ivory; views in Palestine; half-life-size portraits, not enlarged." This is all right enough, and just as much as a catalogue ought to say; but turning over the next leaf what do we find? Prefaced by a similar two-line notice of what is contributed by "A. Claudet, 107, Regent Street," we have a long list of all the medals M. Claudet has obtained, with woodcuts of the four surfaces of two of them; the whole of the rest of the page, with nearly a third of the page following, being occupied, not with a detailed list of what M. Claudet has contributed, but with nearly a *verbatim* copy of a paper read (and published in this Journal above a year ago) by Sir D. Brewster before the Photographic Society of Scotland, on the various discoveries made by M. Claudet. Now, without questioning M. Claudet's "inventive faculty and talent for original research, combined with mechanical skill and dexterity of manipulation," I do question his taste in transferring to the pages of a *catalogue* such an eulogium as Sir D. Brewster, when presenting a medal for one of the best pictures in a provincial Exhibition, thought it proper to pronounce.

The Illustrated Catalogue seems a mere advertising medium, in which those who can afford to pay for the most space in which to detail the qualities and prices of their wares have the greatest advantage. M. Claudet is not, however, singular in inserting matter totally irrelevant to the proper functions of a catalogue, as a glance over other portions of the volume in question, especially in the surgical instrument department, will at once attest.

Leaving the Catalogue, let us now enter the Exhibition itself; and in the meantime, passing by other matters, let us climb to the attic to which photography has been *condemned.* Talk of *high* art! In all conscience it is high enough here! It is elevated, I believe, at least thirty or forty feet above its cousin of the canvas and white lead.

On first entering the room, the photographic visitor thinks that he has, by some mistake, got into the wrong place entirely; for he is, on all sides, surrounded by elaborately-*painted* portraits, both in oil and water colours. The only thing in common with photography which many of them seem to possess is the fact of their being painted on *paper*, which might or might not have been capable of receiving a photographic picture before it was charged with pigments. To the country photographer, who cannot afford to keep a "painter" at a few hundreds per annum, this is very distasteful, and to the strict moralist it is very hateful; but to those who come to the International Exhibition as to a great educational establishment its effects are exceedingly pernicious, as may be gathered from a fragment of conversation overheard:—"Au say, Tummas, be these real phutugraphs?" "'Coorse they be—arn't this the phutugraphic place?"—"Well, when the young master, Mister 'Gustus, took our Moll with his twenty guinea machine, he said he could not take her red hair and blue eyes as they should be; 'cos as why, says he, *colours* can't be took at all." "Aye, but, you see, here they are in their nateral colours. Oh! it's a grand place is Lunnun!" And the good folks go away fully impressed with the fact that *photographs is took in London in their nateral colours.* I do not care to enlarge on this subject or to speak of the connexion of individual pictures therewith, as some painful particulars are already before the photographic public. In a place devoted to the exhibition of photographs all merely painted pictures should have been excluded. "Them's my sentiments," as the excellent Mrs. Spriggins would have remarked had she been still alive.

As hanging in the vicinity of the entrance, we shall begin a brief notice of a few of the pictures with M. Claudet's name attached. The first thing that strikes one is the beauty of some of this gentleman's females.——But here we must leave the artist and set off at a tangent, promising to return to the Exhibition again as soon as possible.

I went to Rotten-row one day—at the proper hour—to see some of the aristocracy. The gentler sex of that class are renowned for their beauty. Of what beauty in a female face consists, I do not care about risking an opinion on at present. Those who want some ideas on this subject should read Burke on *The Sublime and Beautiful*, or Alfred H. Wall, or any other writer, who will reduce it to lines and curves quite mathematically and artistically. Well, in Rotten-row I saw *bona-fide* dukes and duchesses, real live lords and ladies, and "gentles of every degree." The gentlemen are wonderfully like other folk. An Edinburgh baillie once hazarded a remark in public that the Lord Provost of Edinburgh, when present at the opening of the Exhibition in a grand new civic robe, "looked like a nobleman:" this, you observe, is a tacit admission that noblemen are not at all like other folk. Now my organ of admiration not being so fully developed as that of this functionary, I really could not take upon myself to distinguish a nobleman from a gentleman's gentleman—apart from dress. Indeed, I think that in an air of conscious importance "John Thomas" has decidedly the advantage over my lord. But the ladies!—bless their faces!—'twas them I came to see. Among the British aristocracy are said to be the finest women in the world, and some representatives of the class in Rotton-row certainly were very fine. A somewhat close inspection of a few satisfied me that they were indebted as much to art as to nature for the splendid appearance they made. These ladies evidently possess the art of knowing *how* to dress, and this, in contradiction to the trite remark that "beauty unadorned is adorned the most," is the grand secret after all. It is said that "the tailor makes the man;" but not so much is this the case as the fact that the *modiste* and milliner make the woman—not to hint, even in the most indirect manner, about the numerous Madame Rachels and other face enamellers whose assistance at the toilet may be more general than we, who are not of the "upper ten thousand," may be aware of. While in Rotten-row I had hoped to see the famous "Anonyma," with her jewelled whip, handsome greys, and smart tiger; but I did not. Some of the female aristocracy are, from whatever cause, very beautiful; but I should be sorry to assert that equally beautiful women, *per se*, are not to be found out of this class.——With these remarks we return to the Exhibition, and once more climb to the photographic room—a visit to which *The Times* has *at last* found an opportunity of saying "will well repay the trouble of the ascent."

As a fitting sequel to the introduction of mere paintings into a professedly photographic exhibition, one naturally expects—and certainly is not disappointed—to find photographs in monochrome, in every degree of doctoring, from the touching-out of a white spot to a universal stippling all over. As I have remarked, this is a species of dishonesty that should not for a moment have been tolerated—a sentiment which I am sure all true well-wishers to the art will at once endorse.

(To be continued.)

WHERE TO GO WITH THE CAMERA.

By Our Own Pioneer.

ROUND ABOUT EXETER.*

A road opposite the Starcross station will lead on to Mamhead, the seat of Sir Lydstone Newman. The church in the grounds, not far from the house, is a capital subject, and can be taken from several points: the

* Continued from page 293.

interior has a monument to the memory of the brave Sir Robert, who fell at Inkermann. Much that is interesting may be got on the outskirts of the park, occasionally bringing in the house or church. From the high rising ground around here fine panoramic views may be obtained.

Looking towards Exmouth, Sidmouth, Ottery, Honiton, and Lyme Regis, the new road should now be followed overlooking Haldon and the race-course. The people at the turnpike will point out the track for Chudleigh. All this district will be found intersected with narrow lanes, forming, at times, a complete puzzle as to the right one to follow in order to reach the point of destination, and several interesting subjects will meet the view before arriving at Chudleigh. Here there are several good inns, and two or three private houses, where accommodation can be obtained, as a rest of a day or so would be necessary (weather permitting) for collecting the objects of interest in the neighbourhood. Chudleigh Rock, Ugbrooke Park, and the remains of the old palace of the Bishops, have been visited by hundreds; they have been sketched, painted, photographed, and described over and over again; and yet, in the groups of lofty and majestic trees, moss-covered and lichen-bound masses of rock, tangled breaks of leaf and briar, and all the luxuriant wildness of undisturbed nature, there are hundreds of points left—many of the lesser and most effective ones being passed by unheeded, in order to secure the "great one." I would, therefore, counsel the tourist to look out for the former, and he will find himself amply rewarded and in possession of some first-rate subjects, not a whit the worse from having been neglected and unheeded by others. The church, new schools, with the bridge and cottage, on the road to Ugbrooke, are good. The views from the skirts of the park overlooking the town are also remarkably fine. The great beauty of the scenery about here consists in its extraordinary abruptness and irregularity, including immense masses and blocks of blue limestone, known as Chudleigh marble, and high banks and wide-spreading trees, forming in many instances a sort of frame-work for most delightful bits of landscape distances. Some two miles on the Hennock road, and towards Cannonteign, will be found an old mill, which can be taken from the east, west, north, or south, and will yield excellent pictures from either point, with no obstacle to mar the taking. From this mill the road is wonderfully steep and narrow up to Hennock, where good subjects will be found in the church, some detached moorland-like cottages, whitestone rock, and the beautifully-wooded valley below, with the time and storm-battered crest of the great Skat Tor. A few miles will now take us to the old Elizabethan mansion, called Cannonteign House, garrisoned by King Charles in 1645, and taken by General Fairfax. It is a fine old specimen of the period, and well placed for photographing: it is now used as a farmhouse, the noble proprietor living in something modern, snug, and ugly, not far off. The mine, called Wheal Exmouth, is close at hand. It has a tall shaft, with some pretension to elegance of design, and forms a telling subject, either close or from various distant points of what is justly called the "Romantic Valley of the Teign"—a valley full of picturesque beauty, rising banks of thick-leaved copse; projecting cliffs—bold, broad, and massive—covered with botanical specimens so enrapturing to a pre-Raphaelite, who tries to paint them, but is beaten by the camera; with the tortuous course of a bounding crystal stream, strewn with huge masses of stone, and arched over with thick canopies of foliage, are here to be found in profusion; while some cottages and an old mill, between Christow and Bridford, are equal to any subject of the same kind in any part of England. At the former place the fine old church (about to be restored) will, with the buildings used as a school, make an excellent picture. On the road to Bridford, the old church and tower, from the lane on the west, is worth notice. From this to Moreton Hampstead is about five miles, the road again maintaining the prestige of Devon—shady lanes and secluded by-ways.

Moreton Hampstead, called Morton or the Moortown, is a small place on the Dartmoor border. It has some good inns and lodgings, and much to interest the artist round and about. To its elevated situation and exposure to the pure and bracing breeze may be attributed the general healthiness of the inhabitants—their greatest enemy having been fire, which on more than one occasion has made sad havoc with their thatch and cob. The fine old church has within the last few years been thoroughly repaired, restored, and reseated. It will make a good interior, while the eastern belt of magnificent trees materially add to the effect of an exterior view. A fine old elm and cross can be taken in from one point; and from a lane on the right of the turnpike the tower, with its bold and decided moorstone masonry, comes out in fine relief. A house next to the postoffice is worth taking as a "memento," as in it was born the celebrated calculator, George Bidder, who, when a boy, on being asked how many cows' tails it would take to reach the moon, turned the tables on his would-be clever interrogator by wittily and promptly answering—"*One*, if it were *long* enough." The old building of the seventeenth century, with the arched arcade (formerly used as a poorhouse), with the mill on the road to Wray Barton, are all good and worth looking after. Little more than a mile along a leafy, shady lane stands North Bovey. A quiet and clean room can be had at the little inn of this small village, which would be a desirable place to make head-quarters, visiting day by day the attractive points of the neighbourhood—Manaton, Lustleigh, and the far-famed Lustleigh Cleave. They are close at hand, and offer to the artist much that is first-rate. North Bovey Church is not well placed for photographing, and comes in much better as an adjunct in some of the distant views. Three miles off is Manaton, another moor village, situated, with its old church, in a position singularly wild and beautiful, surrounded by grotesquely-shaped hills, high cairns, immense rocks, and rich ivy-covered tors: one immense specimen, formed of five or six layers of granite, and rising to the height of forty feet, is known as Bowerman's Nose. About a mile from Manaton will be found the much-visited and lauded spot called Becky Fall. A timbering bridge (as all wooden structures are called) leads to it from the lane. This hill stream, after flowing some distance from its source, tumbles some 90 or 100 feet over a granite ledge into the wild rocky dell below. Right and left interesting subjects abound, from the abruptness and peculiar character of the locality. From this, the tourist had better retrace his course back to North Bovey, and then try Lustleigh. It is one of the few remaining places that have been proof against the invasion of speculative builders: the gigantic masses of rock and immense granite boulders seem to have acted as a complete barrier to the innovations of these gentry of the line and rule; and, for the sake of art, and as one of Time's hallowed spots, rude and untouched, long may it so continue. The church, with its old gateway and porch, is good from several points, and likewise the interior: it also forms a telling subject as seen from the gap in the wood, under the Raven's Haunt—an immense mass of ivy-hung rock, forming a safe retreat for those dark-feathered birds. On the Horsham estate is an immense collection of large blocks of rock and granite, called the Steps: of this, and from this, some good pictures may be got. There are other points of interest about—as the Bovey Brook, the Bay (a woody recess filled with water), and a peculiar rock called the Nutcrackers. These can be visited, and then a return made to North Bovey—this time past the rectory, where will be found a boulder of great magnitude, and familiarly known as the "Parson's Brown Loaf." Vegetable nature in this locality is full of ornamental beauty: the tender bud, the full-blown flower, trailing and climbing plants—are all to be found round here on the trunks of trees, or on the huge masses of rock, in great profusion, and add considerably to the minuteness and peculiar charm of these scenes of rock, wood, and bramble.

The next point from Bovey is Chagford, an old town, once of note in the early days of woollens and serge. Here are several good inns, and visits may be made to some remarkable places in the village itself. The church first claims attention, and can be well seen either east or west. The Three Crowns Inn, with the old ivied porch, is said to be the spot where fell, as Clarendon relates, Sidney Godolphin, the good and brave, during an attack on the town by the Royalists. Chagford is rich on the score of antiquity, and is, therefore, often visited, especially by artists. But much that is adapted for the pencil and brush is not suited for the camera: I have, therefore, been careful in these descriptions, of only referring to or describing subjects fit for photographing. There are tors, circles, bridges, rock pillars, and cromlechs in the immediate neighbourhood, and scenes of more or less interest; in particular Gidleigh, with the church, rectory, and cottage, and a most picturesque "bit," the remains of an old Norman castle. Before leaving Chagford, it would be well to give a look round Holy Street, at the back of the old factory, and thence to the lonely village of Throwleigh—worth a visit for the church alone, which, in conjunction with the old houses to the east, and the priest's door south, is a most inviting subject. A track through the fields, at the base of the moor, will lead to Sticklepath, where there are two good inns, and from which place visits can be made to South Tawton, Zeal, and Cawsand Beacon; while Belstone, with its church built of massive blocks of moor-stone, gives an example of wildness and solitary grandeur not to be found in any other part of the country. The great point at South Tawton is the lime quarry on the Oxenham estate, an excavation of considerable magnitude affording employment to a large body of men, and offering from its open and peculiar situation many notable points for the photographer:—the temporary wooden watercourses, tramway, kilns, gulleys, blacksmith's shop, and that side of the worked-out portion of the rock now filled in with water; the fine tower of the old church rising majestically from the dark leafy mound of beech and elm, and reflecting its upper stages with the battlements and pinnacles in the deep clear stream that flows below. Returning to Sticklepath, and taking a road to the left at the end of the village, past an old cross, the ascent may be made to Cawsand Beacon, in bygone days the wild home and haunt of wolves, the inhabitants of Sticklepath and Zeal enjoying the right of turf-cutting over sundry acres of the moor in return for destroying and keeping the road free from those wild and ferocious animals. Should the day be clear, the summit of this beacon commands an extensive and amazingly-fine view, stretching even as far as the Quantock Hills in Somersetshire, and distinctly bringing in High Hampton, Hatherleigh, with the memorial obelisk on the moor; Iddesleigh, with its white-towered church; Okehampton, Bow, and Crediton; while to the east are Teignmouth, Mount Pleasant, and the mouth of the Exe. This will, of course, depend on the clearness of the day; but the two near views directly under Cawsand, bringing in Throwleigh in one, and Belstone in the other, are particularly good. On returning to Sticklepath, a conveyance will be met with for Exeter three times a week. The places described and visited, and this route, are arranged with regard to time. Thus, if the tourist has but a week to spare, he can return from Chudleigh or Moretonhampstead: if a fortnight or more, he may fill up the whole time at each locality. Every photographic necessary can be procured in Exeter at the London prices.

It will be found, as the writer has before suggested (in another work), that a plentiful supply of strong cord and a good sharp pruning-knife are requisites of much consequence in taking pictures where briars, brambles, and miscellaneous foliage abound—as they will often be in requisition to hold back branches, and to cut down sundry small and unsightly leafy projections that often cross and mar the most prominent part of a good subject.

An Artist's Letters to a Young Photographer.

A REVIEW AND A FAREWELL.

"I am truly sensible how unequal I have been to the expression of my ideas. To develop the latent excellencies, and draw out the interior principles, of our art requires more skill and practice in writing than is likely to be possessed by a man perpetually occupied in the use of the pencil and palette. * * Still such difficulties ought not to deter artists from putting their thoughts in order as well as they can, and from giving to the public the results of their experience.—*Sir Joshua Reynolds.*

My dear Fellow-Student or Reader,—I commence my last epistle thus because I am well aware that while all my fellow-students have not been my readers, so all my readers have not been my fellow-students. To those who, like myself, were studying how best to combine the excellencies of art with the truthfulness of a scientific process, my previous letters have been specially addressed; but in this I would fain speak to all who have done me the honour of an audience.

In bidding farewell to the subjects which have occupied our attention, I trust to be forgiven if I dwell for a moment or two upon myself, and my aims in writing these letters.

My task had several novel features. To those who, familiar with the facts I have advanced, only master their principles in order to apply them to the arts of drawing and painting, much that I have written would have been unnecessary, while, of course, much that I have omitted speaking of would then have required notice. Explanations, for instance, which were required, not only to demonstrate facts, but to show how, and with what amount of legitimacy, their principles could be applied to the productions of a new art-science, would not then have been required. Works written on the subjects chosen for these epistles, and for such students, seldom contain more than a statement of the principles, and a description of their application to this or that one particular branch in imitative art of which they treat; and it is so common for the authors of such to give the simple facts without any explanations, that I am not acquainted with more than one writer (Ruskin) whose works do not give the same particulars, and in almost the identical words, which are common to each and to all.* But in addressing readers who had, perhaps, never previously turned their attention to these matters, or had but a very indefinite notion of the necessity or advisability of such studies, I had not only to state principles and urge their application, but have also had to point out their importance and explain the foundations upon which they rested. That I have performed this task imperfectly cannot be denied, and my only excuse is that which will be found in the quotation heading this epistle.

These letters have not been without their opponents. Those who were content to stagnate at the dead level of mechanical excellence were also inclined to resent an intrusion which denounced their apathy, and extolled above their own loftiest acquirements the intellectual qualities which they were inclined to underrate and neglect. Those, too, who (led away by a blind reverence for established authorities, or from having acquired erroneous ideas of the province and true value of the imagination in art), were emphatic in denying to photography the position of a fine art, would not be likely to see anything very praiseworthy or desirable in the efforts of one who strove to prove that photography might one day be recognised as a worthy associate in some of arts most imaginative, poetical, and aspiring vocations.

In selecting the many quotations to be found at the head of these epistles, by which I have "larded my lean book with others' fat," I have had an eye to the class of opponents above named, viz., those who have respect for no authorities but such as have been long established and widely recognised; and, I think, while these quotations form a tolerably long and valuable list of our highest authorities, they also go far to establish the views I have ventured to advance.

And, next, with reference to the subjects treated of. In the first place, I endeavoured to show what constituted the proper object of a fine art, and the relative degrees of value which should be attached to various excellencies in the representation of natural scenery. Following this, came arguments intended to show that all the higher and most universally lauded qualities of a picture were not only in perfect harmony with the most absolute truthfulness, but were in themselves part and parcel of that truthfulness. The third letter treated of truthfulness with reference to the representation of air and space, and the expression of poetical sentiment and beauty; my fourth, of truthfulness in the effect conveyed to the eye, by a proper subordination of parts; the succeeding one of subordination as connected with contrast; and the sixth, of the same subject, as affected by truthfulness in the details; from whence we glided into the kindred theme of harmony. Continuing this, we then considered harmony in all its various relations, and I endeavoured to show that the quality was pre-eminently a natural one, and was, therefore, only to be secured in such pictures as were absolutely truthful representations.

Still adhering to this subject, we next gave attention to the value of lines in a picture, and the power of selection possessed by the photographer in reference to such, so as to combine with strict truthfulness a greater power of expression. Our next theme was tone, which again was shown to be only another part of truthfulness as representing the exact character of the light by which the selected landscape was illuminated, with all its attendant effects, sentiments, and associations of ideas. The conclusion of this branch of our studies brought us to another letter, which was devoted to the loftier truths of sentiment. Here we touched ground of a ticklish character, and I thought it wise for us to stop and acquire a little confidence before advancing, by consulting a string of trustworthy and authorised guides. The various valuable opinions thus gleaned being favourable, we felt—at any rate I did—that these loftier aspirations were *still* in perfect keeping with our primary aim of *entire and absolute truthfulness;* so we turned to the sentiments associated with natural scenery to see if therein was aught which could baffle for ever and a day the enthusiasm and perseverance of a true artist-photographer—winding up this portion of my task by a glance at the harmonious working of bath, collodion, and developer essential to the practical rendering of some of nature's most delicate, but powerfuly suggestive and imaginative sentiments. Lines being powerful auxiliaries in giving force to the sentiment or expression of a picture, we next turned our attention in this direction, and *chiaroscuro* being no less valuable, when judiciously employed, for the same end, this was the chosen subject of letter the last.

Now, it will be observed in this brief review of the ground over which we have passed, that one word sums up the goal to which each of all these several studies must necessarily tend, and that they have all one common end or aim, which is—Truthfulness! Aiming earnestly and studiously at this, its attainment will comprise most of the many invaluable qualities advocated in my letters, and will be in perfect keeping with, and in powerful aid of, that greatest and most vital quality of all, which is the most ambitious aim of the greatest artist, and the most praiseworthy acquirement in the eyes of the truest critic, the eloquent and powerful expression of "every feeling and lesson of the creation."

The value of such studies, when carried out in our practice, my dear fellow-student, will not only be made visible in our work, but will also be recognised in the refinement and the exquisite delicacy of our improved susceptibilities. Mrs. Jameson speaks of a landscape-painter who once told her that "sitting down on one occasion to make a study of foliage, his attention was attracted by a group of feathery grass and weeds by the hedge-side, and he was so touched with the inexpressible grace with which nature had thrown together their flowing lines and various forms, that he sat for many moments contemplating them without venturing to put his pencil to the paper, until he felt his eyes moisten with devout admiration and love!" Whereupon, she adds:—"It is, in truth, one of the greatest advantanges in a cultivated taste in art, that it multiplies a thousandfold our enjoyment in the beauties of nature—wakes up our attention to innumerable minute and transient effects of grace, which we should otherwise pass by unperceived."

To the timid and diffident, who have contemplated the numerous qualities which combine in forming a really artistic picture with some alarm at their great variety and number, I would say, club them altogether and call them Truthfulness, remembering, as Carlyle says, that "unity of aim, aided by ordinary vigour of character, will generally ensure perseverance;" and that "the weakest living creature, by concentrating his powers on a single object, can accomplish something" which the strongest, by dispersing his over many, will fail to command.

* This may perhaps be accounted for in a quotation from *The Times*, which says—"It is one result of being familiar with facts that we cease to require explanations of them. The world at large, up to Newton's time, had no curiosity to know *why* an apple fell to the ground."

For myself, and in conclusion, I have uttered my opinions and expressed my feelings without reservation or fear, purely because I am convinced of their truth and importance; and if in so doing I have (as we are all apt to do) underrated those opinions which are antagonistic to my own, my esteem for the acquirements and talents of those opposed to me has been none the less; and I hope that on their part and my own we shall all be ready to lose every remembrance of our controversial differences in a common zeal for the perfection of our common art.

And now, with thanks for your attention, and with a very pleasant remembrance of the many kindly expressions of encouragement which have reached me from different parts of the country during the continuance of these papers, I once more sign myself your grateful fellow-student, ALFRED H. WALL.

Exhibitions.

MACPHERSON'S VIEWS OF ROME, AND SCULPTURES OF THE VATICAN.

It is but recently that we found occasion to notice an Exhibition the entire contents of which were the work of Mr. F. Bedford. We have now to call attention to a still more extensive collection at present on view at No. 9, Conduit Street, Regent Street, the whole contributed by Mr. Robert Macpherson, whose head quarters are in the city which he so ably illustrates. There are upwards of four hundred specimens in the collection executed with judgment and skill, Mr. Macpherson's name alone being sufficient guarantee for their artistic excellence.

Amongst the collection illustrative of the Vatican are six interiors of the Hall, the remainder consisting of representations of its world-renowned contents—for the most part photographed without removal, Mr. Macpherson having enjoyed some unusual facilities to enable him to execute the work.

The larger portion of the collection consists of views of Rome and the surrounding neighbourhood from almost every possible point of interest—the various temples, columns, tombs, arches, statues, and even some paintings, having been reproduced. Numerous also are the general views, such as those of Civita Vecchia, Ninfa, Sermoneta, Porto d'Anzio, and the Pontine Marshes, as well as others of a more particular character. In short, there is scarcely any object of interest in and around the Eternal City of which a record cannot be obtained from this collection, which we must remind our readers will only remain open until the 23rd instant.

EXHIBITION OF THE SOUTH LONDON PHOTOGRAPHIC SOCIETY.*

In our last review of this Exhibition we pointed out what we conceived to be certain errors in respect to the costume and accessories of Mr. Robinson's picture of *Elaine*, and in doing so we have drawn down upon our devoted heads the serious indignation of a contemporary, "*If*," says the writer in question, "Mr. Robinson's picture errs in this matter, why so does the poem, and the critic" (our hapless self) "is under such circumstances right." This little word "if" seems to infer that the critic alluded to is more familiar with Tennyson's poem than with his school-boy history of England; and this opinion is yet further confirmed by the style in which our simple reference to sundry commonplace historical facts is described as "historical and *learned* lore—the consideration of which would demand a comparing of dates and costumes." This reminds us of the old lady who thought a boy of sixteen who could absolutely read and write must be a marvel of learning, simply because she at sixty could do neither the one or the other.

To resume our review. Some card-portraits, No. 416, by Mr. John Hawke, of Devonshire, exhibited in frames which are much too "loud" for the quiet beauty of their contents, are the most brilliant, clear, and vigorous specimens we have seen: they are equally fine as specimens of good negatives and good printing.—No. 499, a frame of portraits by Mr. Leake, jun., although not so good as many of this gentleman's which we have seen, are, nevertheless, excellent pictures.

Some specimens of instantaneous work, by Mr. Buxton, rather incongruously grouped, are very picturesque.—A number of Mr. Bedford's splendid geological, architectural, and pictorial studies nearly fill the whole of the next screen. In examining these we are struck with the fine choice of light, and the artistic care with which, in almost every case, the point of view has been selected. We never have to look for the source of illumination in Mr. Bedford's pictures, and are never in any danger of making a mistake as to what parts retire from and what parts advance towards the light. To this may be primarily attributed the great brilliancy and fine breadth of *chiaroscuro* which characterises very nearly, if not quite all, these works. Mr. Bedford is evidently a strong believer in sunshine. We could linger for hours over this collection, studying therefrom such a mass of botanical, geological, architectural, and artistical lore as we should find in very few libraries of books, and in no other "libraries" of pictures.

A series of pictures by Jackson Brothers. These works seem to be produced by photographers who combine with their keen perception of the picturesque and their skilful readiness of securing effect an occasional carelessness and inartistic blundering which may belong to an individual "brother" or to the Jackson Brothers collectively, but which rather tend to puzzle a critic. Some of the photographs exhibited by these gentlemen are little gems of pictures which remind us strongly of certain works by the fine old Dutch painters; others make interesting and attractive, by clever pictorial treatment, subjects of the most familiar and ordinary, indeed in some cases most unpicturesque, character; some are spoilt by white skies, some are "chalky," and some are very commonplace; but the best, which are by far the most numerous, well deserve the high praise which has more than once been bestowed upon them in the pages of a contemporary The prices attached to these pictures are too far below their worth. —Mr. Blanchard's pictures are those which have already received well-merited laudation from our hands.—Mr. Lennie, of Edinburgh, contributes specimens of instantaneous photography, some of which are very beautiful.—J. Spode sends some otherwise good views, which are in one place, at least, so monotonously uniform in tone and so deficient in brilliancy that they serve as famous foils to some fine pictures hanging near, which are altogether as full of luminous power and vigorous contrasts of *chiaroscuro:* the latter are by J. H. Morgan.—A very pretty little vignette, although far from faultlesss as a photograph, is exhibited by E. Edwards, together with many other specimens, possessing very various degrees of merit.—Some copies from etchings by Albert Durer, photographed by Mr. J. M. Dodd, are very successful.—Mr. Olleys contributes some excellent specimens of microscopical studies, enlarged by his new "reflecting process," which will prove very interesting to all who love to investigate these minute wonders of creation. The foot of a spider, the eye of a fly, sting of a bee, and transverse sections of plants, will be found among these, together with other similar curiosities no less attractive.

Thomas Annan has sent some pictures which are among the greatest treasures of the Exhibition. In these, the picture does not abruptly terminate at the horizon, leaving a blank white space of paper, but has its crowning charms of melting cloud and ærial space, printed in separately, it is true, but in thorough keeping with the general effect, and of the most priceless value, as giving an aspect of reality and artistic power.—Mr. Warner exhibits a number of very fine Venetian views, produced, we believe, by one of our most skilful amateurs.—Some architectural novelties by Ponti, of Venice, are also exhibited, being views from this same romantic city, cleverly coloured by thin washes of body colour, laid on with great mechanical skill, and producing a very pleasing result.—Some very large photographs, by F. C. Earl, are strikingly good. In size these are about 18 × 24. They combine vigour, brilliancy, and clearness to a remarkable degree, and give such views of *Witley Court* and its belongings as must delight the heart of the owner thereof. The most picturesque is a grand-looking view of a beautiful fountain, representing the story of Andromeda; and the picture least to our taste is that large view of *Raglan Castle* exhibited for so long a time in the window of Murray and Heath, of Piccadilly. Inspecting this formal-looking picture, the first thing that strikes one is that, while it would, if nearly equally divided, make two very excellent pictures, as one there is a want of keeping and harmony which spoils the general effect. One-half the picture (divided from top to bottom by the perpendicular line of the tower and its perpendicular reflection in the moat) is dark, one-half light, and the negatives from which the parts are printed do not (as they should always do) possess the same characteristics. The joinings, cut to a serpentine line, are very ingeniously contrived.

Mr. Cole's series of photographs of the works of Sir Christopher Wren have a very soft, harmonious, and pleasing effect. There is not that vigorous intensity of contrast which, when judiciously secured, bring force and brilliancy to the proof; but, without

* Concluded from page 234. This review has been in type for some time, but owing to pressure on our space we have been compelled to hold it over till now.

degenerating into monotony and flatness, there is that peculiar unity and truthfulness in the general effect of tone which, although quiet and modest, is most pleasing, more rare, and very admirable.—A *Memorial Design* is artistically depicted by Mr. Tyley in three good photographs.—Edward Haigh has some admirable specimens: one of the *Botanic Gardens, Melbourne* (from whence all this gentlemen's productions have been sent) is very soft, clear, and delicate, its fault being due to our old enemy the wind.—*Flowers from Nature*, by Mainwaring, show with what success great difficulties in the grouping of colours for photographing may be overcome. One frame full of these productions exhibit them tinted in water colours, but, save in one or two exceptional cases, the colouring is not an improvement.—A few delightful little bits of artistic study are exhibited by A. E. Ainslie.

Some recent arrivals in the shape of solar camera enlargements are contributed by Mr. Atkinson, of Liverpool. They are good, and being produced by the calcium light, can be taken in a darkened room or cellar as readily and with as much certainty as with the strong sunlight we have hitherto believed indispensable for the proper use of this instrument. "What's in a name?" may be asked in reference to the term "solar" in this case. These pictures are touched with chalk.—Mr. John Lamb contributes some pictures, not altogether perfect as photographs, but still good and and interesting, as showing what can be done by the development printing process, so strongly recommended by Mr. Sutton. We do not like some of the tones; but variety in this respect has been purposely got to show that the power of regulating such matters is as great by this process as by that more usually adopted.—Mr. Bartholomew exhibits some photographs illustrative of his experiments in various novel directions: these are not otherwise interesting either as pictures or as photographs. Mr. Bartholomew is a clever experimentalist, who, like others who resemble him, would, doubtless, rather make one scientific discovery than a very large number of artistic pictures, and must therefore be judged rather as the valuable experimentalist than as the artist whose skill afterwards gives to such experiments their real and practical value. —The modified process of Petschler and Mann has produced some pictures of great merit, which have natural skies, and are altogether most effective and pleasing specimens of landscape art.—Among the most picturesque and attractive specimens are some which, owing to their late arrival, have not received that prominence of position which they thoroughly deserve. These are landscapes, by A. K. Macdonald, full of such sentiment, beauty, and truthfulness, as must arouse all Mr. Wall's enthusiasm on behalf of such high qualities of the picturesque. The frames in which these pictures are hung tend to spoil them, being of the same gaudy kind as those in which Mr. Hawke's specimens are placed.—Mr. Skaife contributes a neat glass shade protecting his pistol-camera, and illustrating by various specimens and apparatus its mode of taking life. The enlargements from the minute negatives do not strike us as particularly good or pleasing.

Mr. Gladwell contributes some grand large photographs from Rome. Certainly nothing but a photograph can convey a genuine conception of the mighty works and wondrous genius here embodied. The *Moses* of Michæl Angelo, from the Vatican, done over and over again in sketches and engravings, by artists of all countries and of every degree of merit, can only be truly realised to the mind when seen *de facto*, or in a photograph: as the subject of one huge picture here exhibited it is quite awe-inspiring. It makes us understand the ardour of Etty, who, having made a sketch of Angelo's glorious masterpiece, which would have been poor if compared with this photograph, and having lost it on the road from Bologna to Florence, lit a lantern, and retraced his steps along the wild and lonely mountain path, after nightfall, in order to recover it. Among the magnificent specimens sent by Mr. Gladwell we recognise the fine works of Alinari, Cuccioni, and others, who are also exhibitors at the International Exhibition.

Some prints from enlarged negatives, by Mr. Warner, illustrative of the process explained by Mr. Heath at a recent meeting of the London Photographic Society, are good on the whole, although not equally so.—Glorious bits of cloud-land on glass and paper, in which we seem to trace hills and valleys, plains and mountains, formed by the ever-changing vapours through vast regions of space, are contributed by Mr. Kibble.—Selections from Mr. S. Thompson's excellent *Cabinet Photographs* have already been described and criticised in these pages.

Mr. R. Gordon largely increases the show of first-class landscapes; but he does not seem to be thoroughly awakened to the mistake of white skies.—Mr. Frank Howard's stereographs, by the Fothergill process, are good specimens of careful manipulation and excellent photography.—Lyndon Smith's specimens are not what one might expect from this clever artist.—Some vignetted card-portraits, by Mr. Wall, are good, and a photograph from one of this gentleman's humorous pen-and-ink sketches, by Mr. Ash, is very amusing.—Mr. Ernest Edwards is a valuable contributor. —Mr. Fothergill and Mr. Branfill contribute some admirable examples of pictures by the tannin process—(the doctor does not always patronise his own medicines).—Mr. Penny has sent some excellent specimens of the same.—*Views in the East*, by Mr. G. C. Buxton, are remarkably good.—The calotype process—seemingly one of the most neglected —is not without worthy representatives in this Exhibition, chief amongst whom are Mr. Baynham Jones and Captain Sellon.

Coloured photography occupies a minor position. Mr. Macandrew exhibits some capital specimens.—A very fine picture of a *Spanish Girl* is contributed by M. Ado Lafollie, with a portrait of *Piers St. Aubyn*, both these being most artistically painted in oil.—A neatly-tinted picture is exhibited by Miss E. P. Barlow.—Some pictures painted in water-colours, by Mrs. Macandrew, are very cleverly executed.—A well-rounded, vigorous, life-sized head and bust, painted in oil on a photograph, enlarged from a quarter-plate negative, is contributed by Mr. A. H. Wall. The likeness, judging from the small untouched print, is well preserved, but there is a want of mellow harmony in the blending of the flesh-tints.—Some inartistic, vulgarly-coloured (?) portraits, by G. Triptree—hard, unnatural, and metallic—are funnily enough advertised for sale at £1 10s. coloured, and 10s. plain: one of these being described as a *Portrait of the Artist, H. A. C.*, leads us to wonder whether the young ladies visiting this gallery are likely to purchase a portrait of a semi-military gentleman so eager to dispose of his "counterfeit presentment" in the uniform of the "Honourable Artillery Company;" or if not, what is likely to create a sale for this portrait? Is it possible that he is "a celebrity" and we don't know it?

In concluding this review of a young Society's first Exhibition, we must not forget to congratulate its members upon the very large amount of success achieved.

The catalogue is a well-intentioned failure, due, we understand, to some blunder on the part of officials at the Crystal Palace.

R. A. S.

Exhibition Gossip.

REVISION OF THE AWARDS AND DISTRIBUTION OF THE MEDALS. &c.—FRENCH AND ENGLISH GENRE STUDIES.

It is rumoured that a revision of the awards commented upon in our last "Gossip" will certainly take place, and that the improvements in a new application of the art made by M. Joubert will not, after all, be overlooked. The name of a gentleman to whom these scrupulously careful Jurors have awarded the "honourable mention" certificate has been removed from the list, for the simple, but certainly sufficient, reason that such gentleman merely applied for space and never exhibited at all.* Notices posted in the building also inform us that the medals and certificates will not be distributed until after the closing of the Exhibition, when the occasion will be an excuse for another public ceremony, the witnessing of which may be obtained for the low charge of £1 per head!

And, now, my dear reader, give me your imaginary arm, and let us once more stroll into the great international shed. By-the-bye, is it not sad to hear that this huge mass of ugliness and vile taste is to have its unattractive face enamelled and painted, its disproportionate frame veneered and polished, and that it and its crinoline domes are to stand, a monument of shame to the nation, for ever and a day, if it will last so long?

We were examining the composition or *genre* studies, and were gossiping about the specimens exhibited by Robinson, when we last quitted them; and, to resume, we therefore make our way into the British Department.

The large blank, bare spaces on the wall look very melancholy. All the water-colour photographs seem to have departed, and none but the more permanent oil-pictures remain, although some of these which were executed without sufficient body in the colours show signs which tell us that the photographs beneath are rapidly departing. Oil-coloured pictures which have been painted more solidly remain unaltered in the slightest degree, and there are some of these which we ought heartily to wish less permanent,

* The allusion here made is to Mr. Beattie, of Dublin, whose name has been *removed* from the list of exhibitors to whom have been awarded "honourable mention." The name of Sir A. Macdonald has been *added* to the same list. So far as respects these two names, the list of awards published in our last number will be found to be correct.—Ed.

especially two wretched chalk and indigo productions exhibited by T. R. Williams, who, as we before said, also exhibits other specimens which are very tastefully coloured. There were plenty of folk toiling and grumbling their way up the steep stairs, and the room is now tolerably full of people, who are pleased with the pictures, and puzzled by the apparatus, and loudly express the feelings engendered by both. There are many photographers present, as we can tell by the scraps of conversation which reach us, and it is pleasant to find therefrom that, like good boys, they all read their journals, especially THE BRITISH. This is by the way, however, and we must begin our inspection of the pictures.

Mr. Robinson's picture *Fading Away* has been so often criticised, that I must confine myself to saying that, in my opinion, it is a composition which he has not yet surpassed. As to the objections brought against it by certain morbidly, delicate critics, who seem to think the great mission of a fine art is alternately to tickle them into laughter and soothe them into dreaming indolence, I can only add that I don't agree with them, and think some of the most sad and melancholy scenes in life are calculated to give birth to the very noblest thoughts, and rouse in us the most humanising feelings. I could say a great deal on this subject; but, don't be alarmed!—I won't. *The Top of the Hill* is a very charming little picture, full of homely and placid sentiment; but we must wish the model had been more beautiful. (I hope models don't read the photographic journals). *Here they Come!* is a good idea well carried out. In most of Mr. Robinson's composition pictures the scissors are too pointedly suggested, and patchwork too prominent in reference to the mechanical combination of the several parts—not at all in reference to the keeping or harmony in an artistic sense, for in this they are singularly faultless. The paste and scissors are terrible evils, and I heartily wish they could be avoided altogether. Rejlander seems inclined to discard them, for most of his recent pictures have been executed without their aid.

Mr. Mayall has once again entered the ranks of *genre* photographers, and, so far as the photography goes, equals, or surpasses, the best of his fellow-labourers; but in this department of the art good manipulation ranks as the lowest quality, and more intellectual requirements are first in demand. Judged by such a standard, Mr. Mayall does not here seem likely to obtain very high rank. In making this assertion, I have not lost sight of the fact of this gentleman having obtained a medal for the very qualities I ventured to suspect the existence of. *One of the Bye-ways of Life* is a simple story well told, and the models seem to have entered into the spirit of the subject. *Love and Labour* is simply a very good photographic group of an aged rustic labourer and a little girl. This picture says, with the famous knifegrinder—"Story, sir! why, Lord bless you! I have none to tell." *The Great Light Shines Through the Smallest Window* is a formal group of the same old man and the same little girl, in which the models sit one precisely opposite the other, with a background so arranged as to repeat the same formal appearance. Of course the child is reading the Great Book of Life, and the old man is listening. But, so far as regards the expression of any particular feeling or sentiment in either face, the book might be any other book, and the picture receive any other title. *Italy of the Past* reminds us of nothing but stage grouping and *poses plastiques*. *A Rival in the Camp* is a well-worn subject humorously treated. *A Real Ten Pounder* is chiefly interesting as containing the portraits of Alfred Crowquill and Mr. Mayall. *The Bridge of Sighs* is one of the most ludicrous blunders and failures in this department of artistic photography which I hope we shall ever see again.

There are some good studies of this kind by Charles Critchett, Ross and Thomson, Heath and Beau, and a few others, but none of these demand very special notice. Among the pictures of the Amateur Photographic Association there is a charming little photograph of an *Arabian Girl at a Well*. *A Group of Fruit*, &c. (356), by Fenton, is a very artistic and beautiful picture. If I remember rightly it was said of this picture that the grouping was by Lance, the great painter of such subjects.—Two buxom little servant girls snatching a luxurious bit of chat, while with bare round arms and faces full of animation they are drawing water, is a very amusing little subject, cleverly photographed by J. P. Kaiser, and exhibited by the Amateur Photographic Association.

In pursuance of the plan I have laid down for these gossiping papers, let us now seek subjects of the same kind as those we have been reviewing in the foreign departments. As we are leaving the British "garret" there is a heavy shower of rain heard on the roof, and before we reach the stairs we pass through one or two miniature shower baths.

We find matters worse in the French Department; for here the rain has altogether destroyed a portion of the glass, and two of the screens are concealed by cloths to shield them from its damaging influence.

The one medal awarded for artistic excellence has been won by M. Alophe, who with M. Silvy are the only exhibitors of *genre* studies here to be found. "Tableaux de genre" upon the outer covering of a large album points out the whereabouts of M. Alophe's productions in this branch of the art, wherein we find nude and semi-nude female figures, devoid of grace, expression, or sentiment, arranged in all sorts of awkward and angular positions before a painted background representing a garden, dished up with the usual architectural accompaniments of water, bridges, terraces, fountains, &c., &c. Some other studies of figures follow these, and greatly surpass them. *The Dying Wife* is decidedly good. *A Girl Thoughtfully Contemplating her Wedding Dress* is also good. *A Man Soliciting Charity* is a charming picture of a very sweet model; and the final page of the book is certainly the best of all as a piece of artistic composition and excellent photography.—M. Silvy exhibits *The Evening Star* and *Picoli Suonatarin*—two pictures which were exhibited in London years ago, and in which it almost seems as if all M. Silvy's ambition for such effects had been exhausted. They are both very excellent productions, and the latter is very picturesque and well managed.

And now we will bid adieu to this branch of the art, as represented in the great International Exhibition.

Before laying down my pen, however, having received several inquiries from readers of these papers, I may add that the address of M. Ken is 10, Boulevard Montmartre, Paris. A. H. W.

Foreign Correspondence.

Paris, August 6th, 1862.

ONE of our most talented photographers, who employs the tannin process with great success, has given me the following formula, which he has found by experience to be the most effective:—

Distilled water	500	grammes.
Tannic acid	4	„
Rectified alcohol	25	„

Dissolve and filter.

EXCITING BATH.

Water	1000	grammes.
Nitrate of silver	60	„
Acetic acid	10	„

The collodion is the same as for the wet process, only it is advisable that it should contain but little bromide. Sensitise the plate, wash it in distilled water, let it dry, and then pour on it the tannin solution, which should be allowed to dry in a place free from dust. When the glass is quite dry, put a little painter's varnish along the edges.

The duration of exposure in the camera is ten or even fifteen times longer than in the wet process; but, if the glass be well heated before the development, the time of exposure may be considerably shortened.

DEVELOPING SOLUTION.

Water	500	grammes.
Pyrogallic acid	5	„
Acetic acid	50	„

Wash the glass and then pour on it a little of this solution pure. Let it drain off, and pour on it more of the solution, with the addition of a few drops of the silver solution of three-per-cent. strength.

Fix with the hyposulphite.

This same artist—whose proofs have attracted much notice at the different Exhibitions, not only on account of the artistic feeling they display, but also on account of their beauty of tone—has likewise given me the formulæ he employs in printing:—

Distilled water	1000	grammes.
Nitrate of silver (fused)	70	„
Pure ammonia	7 or 8	drops.

Mix thoroughly, allow it to settle, and then filter.

PREPARATION FOR THE PAPER.

Water	1000	grammes.
Albumen	1000	„
Chloride of ammonium	1½	„

Beat up to a froth, and then allow it to settle.

The paper may remain several minutes on this salting bath, but not more than two or three minutes on the silver bath.

It is a very important point in photography, and one demanding most particular attention, to know the modifications required in

the processes in consequence of change of climate. Travelling operators incur too many disappointments not to seek the means of avoiding those at least which arise from the external circumstances of the place where they may be, by availing themselves of the experience of excursionists who have preceded them.

I have requested a photographer, who has recently visited Algeria, and who has brought back a most interesting collection of instantaneous views, to favour me with the observations he made on this subject, and I here give you a concise account of the same:—

In all the parts of France through which he passed on his way to Algeria, M. Guyot (the photographer above mentioned) was able to operate with the same proportions as at Paris; but when he got to Algiers his glasses had become quite red. He found it indispensable to employ a silver bath of five per cent. instead of seven—to diminish the proportion of iodide by one-third, and to increase that of bromide to the same extent. The collodion he found it necessary to prepare with four parts of ether to five of alcohol, with six grammes of cotton per litre instead of eight grammes. With these modifications M. Guyot succeeded in taking three hundred negatives, representing races, fantasia, Arab dancers, &c.,—all subjects requiring extremely rapid, if not instantaneous, execution. It is indispensable for this kind of work to employ a silver bath rendered completely neutral by adding from time to time a drop of liquid ammonia. M. Guyot also recommends to develop with iron and intensify.

I have just received a note from Amsterdam, from which I learn that Messrs. Maxwell Lyte and Vernon Heath, who sent specimens to the Exhibition now open in the capital of the Netherlands, have obtained the same success as their works have procured them everywhere else. Our French photographers were also represented there by the Marquis de Berenger, Bisson Brothers, Ferrier and Soulier, &c. The Exhibition will be prolonged to the 1st October.

There is much talk of a new process for instantaneous dry collodion. I have seen several most favourable specimens of the results obtained. Unfortunately I cannot explain the means employed, as I have not been able to ascertain them. In the present instance the inventor is a person whose name inspires an unlimited confidence, so we must wait as patiently as we can till he shall please to make known his new process. E. LACAN.

Philadelphia, July 28, 1862.

It is always a matter of interest when a new photographic establishment is opened with any pretension to excellence; but more interest still is felt when some long-established and perhaps celebrated firm moves to a new locality, and into rooms fitted up with especial reference to the convenience of their customers and of their operators. It is, of course, presumed that their own experience and the experience of others will be called into play to aid in producing what may be considered the most perfect general arrangement. Some new aspirants for public favour have hoped to establish a thriving business on the one claim of "sky-light on the ground floor;" but we find the masses flock to those operators who do the best work, quite regardless of the number of steps to be climbed in seeking the sun's bright painting-room.

Broadbent and Co.—whose names have been mentioned in connexion with the solar-camera in a former letter to The British Journal of Photography, have moved about two blocks higher up Chesnut-street than their old stand. From their long experience in the business, and their high reputation, a description of their new outfit may be in place, as affording a sketch of a first-class American photographic establishment. Some surprise was expressed by their friends because they ignored the now prevailing fashion of large show-rooms on the ground floor, where samples of their work could be seen behind huge plate-glass windows. They have, however, made ample amends for this deviation from fashion in their lavish expenditure on the rooms above. The building they occupy is No. 3, on Chesnut-street, and is three stories high. They make use of the whole of this large edifice above the first floor, having a frontage of fifty feet, and the premises run back fifty-two feet to an open yard.

The entrance from the street is in the centre of the building by an easy flight of stairs. One half of the second floor is occupied by their large show or reception-room and the ladies' dressing-room—the latter not taking up much space, but replete with all the necessary conveniences, and under the care of attentive waiting-maids. Their fine collection of specimens makes this room very attractive, a large portion of them consisting of coloured photographs, principally ivorytypes. The remaining portion of this same floor is devoted to their painting-room and apartments for mounting and assorting their prints. The entrance to their sky-light gallery is by a broad flight of stairs from their reception-room, terminating in a pleasant and well-furnished sitting-room. Here, also, is a dressing-room for gentlemen, and a private dressing-room for brides or ladies in fancy costumes. They have two separate sky-lights, both facing the north, and to the arrangement of these I would call especial attention.

As I have before stated, Mr. Wenderoth, one of the partners in the firm, has always been celebrated for his ivorytypes and other coloured photographs, and it is natural he should endeavour to produce pictures which would bear colouring to the best advantage. He would, of course, endeavour to avoid the deep shadows below the chin and eyebrow, and would avoid, too, if possible, the severe high lights on the top of the head, tips of the ears, and on parts so far removed from the front of the picture as would seem to call for retreating shadows to give rotundity. He would try also to light the floor well, and show the carpet up to the feet of his sitters. To accomplish all this as far as possible, he uses, in combination with his sky-lights, very large side-lights facing the north. The glass window starts three feet from the floor, and is ten feet wide by seven feet high, where it unites to the lowest part of the sky-light. This is also ten feet wide, and runs up twelve feet at an angle of 30°. The side-light is glazed with blue glass, the sky-light with white ground-glass. Below this ground-glass sash slide are two other sashes glazed with blue glass: these are commanded by cords and pullies, so as to readily run out of the way. The idea is to dispense with the blue light in cloudy weather. The sitters are not placed below this sky-light, but well back from it, so as to receive the light more directly on the face, and not on the head. The rooms being so very large—about twenty-five feet square each—there is abundance of space for posing groups or selecting good light for single sitters. Their screens and back-grounds are all well made and are provided with large casters, the wooden wheels of which are about five inches diameter. The screens are also provided with iron handles, that there may be no excuse to soil them with dirty fingers. No artificial "properties" are to be seen—no profile book-cases; but all their furniture is of black walnut—oiled, not varnished—and of the most substantial character.

On the same floor with the sky-light are two dark rooms, and a large room for washing and toning prints. This room has a water-tight floor of asphaltum, and is provided with six washing tanks, four feet square each, provided with the usual automatic syphon emptying arrangement, and the water is supplied by jets. Here, also, is the large stone-ware sink or tank for cleaning plates in the nitrate of mercury solution. The printing-room is in the fourth storey back, and has an uninterrupted southern exposure of fifty feet. On this floor also is a dark room for the operator who attends to the copying, and a yellow-lighted room for silvering paper, besides the store-room for negatives. In the printing-room is a small apartment partitioned off for the solar camera. Before describing the arrangement of this, however, I will say a few words about their general management of business.

Since the advent of card-pictures, there has existed a great deal of confusion in many of our galleries in the preservation of negatives, and as to the prompt execution of orders for printing. The every-day work from new negatives may be done without delay, but the business is confused by the constant demand for duplicates from old negatives. At Broadbent and Co.'s this part of the business has been made the especial object of attention of Mr. Broadbent, the senior partner, and of Mr. Taylor (who has recently entered the firm), and both of whom are noted for their methodical and energetic attention to the minute details of business. They have introduced the good plan of issuing tickets, making regular appointments of sitting-time any number of days in advance, so that all can be accommodated to the time best suited to them, and they are sure of being waited on at the hour specified without delay. Their system of books shows clearly all orders, and their order of precedence; and no work can be longer than three days before delivery, in any weather. There is an air of comfort and refinement about the whole establishment truly grateful. The sitting-room tables being covered with the newest literature of the day, seem to court a little delay, and invite people to be before their appointed time that they may enjoy a little quiet reading before being taken.

It gives me great pleasure to speak well of this firm, and to chronicle its advancement. Mr. Broadbent himself has been in the business (first as a daguerreotypist) for twenty years, and all who know him bear testimony to his uniform kindness to all those he has to deal with; and I would mention, for the benefit of some in the same artistic line of business I wot of, that his courtesy has been a source of much gain, financially, and has also secured to him a host of warm friends.

In the arrangement of the solar camera Mr. Wenderoth has shown considerable mechanical ability. The frame of the instrument is made of wrought iron tubing—none of it less than two and a-half inches in diameter; and it is as easy to move, and seemingly as solid in its structure, as an equatorial telescope. It moves on hardened centre-pins, and its 18-inch achromatic condenser receives the direct rays of the sun without the intervention of any reflector. Part of the instrument projects into the open air above the roof, and the other part swings within the dark-room, the light being shut out by a flexible diaphragm, which does not impede its motion in the least.

Letters received during the last few weeks show that the subject of the solar camera is now interesting some of our savans; but, as yet, they can only theorise, as few have put up fixtures of their own for experiment. One writer says:—"With regard to the use of a condensing lens, I would venture to suggest—1st. That the light falling on the negative would be white, with the exception of an exceedingly narrow border to the circular disc; therefore its chromatic aberration should have no effect. 2nd. That even were the light falling on the negative of different refrangibility at different places, if the copying lens is correct they should all come to the same focus; otherwise it would be impossible to focus *white* light, for such contains all the colours, and each would be brought to a separate focus. 3rd. The position of the condensing lens can have no effect on the focal length of the copying, although it has a very important effect on the amount of light. The proper place for the focus of the condensing lens is between the front and back lens of the copying combination, at a distance from each proportioned to its focal length. By changing the condensing lens from this position it will be easy to reduce the intensity (contrast), should the negative be too intense. The light through the dense parts of the negative being more completely dispersed than that passing through the transparent parts, a smaller proportion will, therefore, be lost in the former case."* I make this quotation without giving the author's name; for his theory differs so much from the practice of those using the instrument, that experiment may lead him to a different conclusion.

I say my correspondent's theory differs from the practice of those using the instrument. I should rather say of some; for I have recently seen very large and very sharp proofs printed with a chromatic condensing lens, and I have been assured by Mr. Richards, who made them, that they were printed in the visual focus of his instrument, and, having examined this condenser, know that it is not achromatic. The Mr. Richards alluded to is F. de B. Richards, who—artist by profession—was lured away from his brush by the charm of sun-painting, and now has rooms on Chesnut-street, opposite the State House. Some years ago he made a tour through Europe, and on his return wrote—*Europe; or What I Saw: Being Random Sketches from the Portfolio of an Artist.* The book was illustrated by photographs of places of interest. His principal business has been enlarging; and for some years he was employed by New York operators, as well as by Philadelphians. His cameras—he has two—were built by a Mr. D. Shive, who has a patent for his arrangement, and who claims that all using the solar camera by direct light, and not by reflected light, are infringing his patent. Of this I know nothing, and "tell the story as it was told to me."

These two cameras are arranged on the top of the house in a revolving tower. The operator has his seat between the two instruments, controlling their movements by two balance wheels—one of which regulates the vertical movement of both instruments simultaneously, and the other rotates the tower on its base. The room is large enough and the screen so arranged as to be able to print on paper eight feet square. The largest proof I have seen, however, is 6 × 4½ feet, very clear and sharp—fully as sharp as the lines in nature. Both of these instruments have 18-inch chromatic condensers, and print from whole-size negatives. Examining some of the negatives, and comparing them with the prints made from them, I cannot but be convinced that the direct printing process—*i.e.*, dispensing with the reflector—permits the use of a much stronger negative than can be used with reflected light.

In future letters to THE BRITISH JOURNAL OF PHOTOGRAPHY I hope to be able to speak more specifically on the subject of solar cameras. In my investigations, thus far, I have been obliged to listen to the experience of others, and take their work as proof of the correctness of their methods of working. But still the troubles of solar-camera printings have been ascribed to so many different causes, that I feel like one groping in the dark, and only regret that I have neither the time or opportunity to experiment for myself.

* We shall remark upon this in our next.—ED.

Professor Edwin Emmerson, of Troy, the inventor of the stereoscope which was to combine pictures four inches square, writes saying that he is about visiting England on his way to France, where he will remain several years. He solicits the acquaintance of amateur photographers in England, and will bear letters to Mr. Shadbolt, who will, no doubt, aid him in making the acquaintance of our English friends. Mr. Emmerson is an enthusiastic amateur, and well versed in the art as practised in this country.

It may be a matter of interest, and worth mentioning, that taxation—the fruit of our rebellion—and the expenses of the war, will touch but lightly our practical photographers. They will be obliged to take out a license, at a cost of ten or fifteen dollars, according to their profits, whether over 500 dollars or over 1000 dollars per annum. Their expenses are, however, increased (it is to be hoped only temporarily) by the scarcity of change and the high value of silver currency. Already nitrate of silver has advanced from one dollar to one dollar and fifteen cents per ounce, and chloride of gold in the same proportion. This increase of cost, should it be permanent, can be more than met by an increased economy in the waste solutions. It is to be regretted that more care is not taken to prevent the waste of such a large quantity of silver as daily finds its way to the city sewers. In the very large establishments there has been a great deal of improvement in this respect, and it is quite common to see in connexion with the first washing tank a deep barrel, into which the water enters at the middle, and is drawn off at the top, the barrel holding in solution common salt. Or, in some places, the water is poured into barrels containing shreds of copper or granulated zinc, and, in some few cases, iron turnings. In very few places, however, has there been any attempt to recover the gold from the old toning solutions. Mr. Waldack says he finds this an important object in his business.

Speaking of Mr. Waldack reminds me that his sequel to his work on photography, treating of card-picture making, has now taken the place of Devine's book (which is out of print), and is meeting with a ready sale. It contains a good deal of useful information. He mentions the use of ammonio-nitrate of silver for albumen paper; but remarks that it cannot be used in warm weather. I think he must be mistaken in this assertion, for now, at midsummer, it is used in all the principal establishments in Philadelphia.

Mr. E. Borda has published, in the *American Journal of Photography*, his recent experiments on quick dry plates, and states that they were instituted at the suggestion of Mr. Henry T. Anthony, of New York. It is this plan I alluded to in my letter from New York—or in the one immediately succeeding it—when I stated that Mr. Anthony had in view the preparing of dry plates for sale. His idea was that fuming the dry tannin plates with ammonia would quicken them. He mentioned it to some of the members of the Amateur Photographic Exchange Club. Mr. Borda thinks that it is a step in the right direction, but asserts that the fuming will do as well after exposure, and before development, as before exposure. This being the case, Mr. Anthony at once came to the conclusion that science would be advanced by making it public: hence he permitted Mr. Borda to write on the subject. Mr. Borda's experiments go to show that, to use it successfully, an additional amount of citric acid is required in the developer to obviate the tendency to fog. Some of our other amateurs have not been so well pleased with it as Mr. Borda has: but they have not paid as much attention to the subject as he has.

Mr. Anthony himself sent his exchange pictures for this month made with his solid milk preservative, and his proofs are unexceptionable—so full of fine detail in the shadows, and there is no snowy effect on the high lights.

We are looking for some of Mr. Harrison's new globe lenses to be in the market next week. He has, no doubt, been delayed in finishing them by the very great demand for his ordinary quarter-size portrait tubes, in sets of four, for card-picture making.

Glancing at my memorandum-book with astonishment at the number of items not yet alluded to, seeing that my letter has reached such an extraordinary length, I hasten to close, first stating that having tried the gum roller wringing machines for drying proofs, I am satisfied that even albumen prints are much improved by the operation—being condensed, and the albumen surface rendered quite smooth and even. The allusion to their use in a former letter has induced several persons to try them.

The response of some of my friends, in answer to inquiries for *Strasburg Cathedral* and the *Arch of Titus* for Dr. Holmes, shows that stereographs should have been specified—large proofs only having been offered.

Apologising for the length of my letter, I am, with due regard, yours,

COLEMAN SELLERS.

Scraps and Fragments.

New Publications.—Mr. Hogarth, of the Haymarket, has published some photographs of Normandy by Mr. Robert Murray, an artist known in connexion with some fine Egyptian views.——A new series of studies from nature for the use of artists, by Mr. O. G. Rejlander, have been announced.

Honour to a Liverpool Amateur Photographer.—We are glad to find that Mr. J. A. Forrest, of Liverpool, so long and so favourably known as an enthusiastic amateur photographer, and as a manufacturer of photographic glass, has been awarded a medal in Class XXXIV. at the International Exhibition for "excellence in artistic design and colour," in connexion with stained glass for ecclesiastical architecture and for other purposes.

Photographic Papers.—Many photographers, in complaining of the difficulty they experience in obtaining good papers, trace all their troubles to the introduction of the alkaline gold-toning process; but we have lately heard many of the manufacturers of photographic papers assert that there really was a very marked alteration in the quality of the papers they procured, dating from about the time when the alkaline-toning process was first introduced.

The "Liber Custumarum."—The Court of Common Council of the City of London is greatly concerned to find that many leaves have been extracted from the *Liber Custumarum* in the civic library. After many efforts to regain the missing portion of the work from the British Museum, where it appears they have been discovered, and many indignant protests of the Corporation against their unjust detention, the question has been reluctantly adjourned by the Court. If any one had suggested how readily *faesimiles* of the extracted leaves could have been procured by the aid of photography, the Council would, we doubt not, have very readily listened to the same; and, as one member of this Court is a professional photographer in the city, we are rather surprised to find this suggestion was not made.

Hints to Colourists.—Being with an old friend of ours, an experienced and clever artist, who formerly enjoyed great repute as a miniature painter, he showed us a sketchelly-executed photographic miniature, coloured on a very thin, close-textured, plain salted Saxe paper, which had a surface closely resembling that of ivory. This, we were informed, was obtained by coating the back of the paper, before mounting the print, with isinglass, three grains to the ounce of water, and afterwards passing it through the rolling press. The same gentleman also stated that he could make the washes of colour bite more readily and adhere more firmly on the albumenised paper, so as to enable him to put one wash over another by first using a solution composed of fifteen grains of gelatine with half a teaspoonful of alcohol to the ounce of water.

A Photographic Volunteer Corps.—In emulation of the artists, lawyers, and others, several photographers, who are also volunteers, recently met at Mr. Wall's studio, 35, Westbourne-grove, Bayswater, to consider the possibility of organising a rifle corps, to be composed of amateur and professional photographers. The feeling of unity and fellowship which must necessarily characterise corps composed of gentlemen engaged in the same pursuits, and animated by the same interests, must be greatly conducive towards that *esprit de corps* to which the volunteer movement will the more surely owe its permanence and degree of utility. From a feeling of patriotism, therefore, as well as from the interest we otherwise take in this movement as photographic representatives, we shall be happy to assist by receiving the names of those willing to join the cause.

French and English Science and Photography in 1855.—In a popular and amusingly written little work by Blanchard Jerrold, called "*Paris under the Bees*," we find the following brief comparison of English and French photography in 1855. Our readers being now able to judge the relative progress made by the two countries in this art since that date, by their visits to the Great Exhibition, we give the extract:—"Nor can our neighbours aspire to teach us any new scientific truths. No living Frenchman has added to the store of knowledge facts at once so important and numerous as those with which Faraday has enriched the world. But here, again, we may note that ingenuity which almost amounts to genius, and which is a Gallic characteristic entirely. In all scientific studies which require delicate manipulation—nice adjustment—their skill is pre-eminent. Tested by their discoveries, French scientific men cannot rank high, but, estimated as students, they are beyond all praise. The French, again, are fine makers of optical instruments. They have also a great reputation as builders of models of machinery; but, directly a machine is required for work, their skill must yield place to the Englishman or the Belgian. Again: they are exquisite photographers, and in this art all those qualities which distinguish a Frenchman are needed. The fine manipulation—the nice taste in the selection of details—the enthusiasm in favour of the process for its intrinsic beauty—all these qualities are present, and favour the French photographic student's advancement. One of the most eminent photographers of Paris discriminated truly between his countrymen and the English in this matter. He said that in London photography had been pursued for the sole purpose of making money, whereas in Paris there were photographers who pursued the art because they loved it. Of these enthusiasts my informant was an apt example. He had spent forty or fifty thousand francs in experiments. He had expended all the money he had obtained from government contracts in the pursuit of improvements, and had succeeded, when I looked over his portfolio, in producing landscapes the delicate half shades of which recalled Turner. They were splendid light-and-shade reflections of the exquisite landscapes of Brittany. As he walked with me through his *atélier*, he proudly showed me the colossal baths and other apparatus with which he produced his photographs of the Louvre and other public places. He was generally up in the morning at half-past five o'clock, and at six was prepared for his first negative. His photographs fetched high prices, were valued by the French government, and were bought by Prince Albert; yet he seemed pleased at his success only because it gave him the means to pursue his studies, and approach still nearer to perfection in his darling process. And he was right in distinguishing the French photographer from the English photographer,—attributing high motives to the one and mercenary motives to the other." We think the author of the above was somewhat unjust to the English photographer, and that his admiration of the French photographer's generous enthusiasm led him unduly to exalt the one side at the expense of the other. Even in 1855, English *amateurs*, as self-denying, as reckless of pecuniary loss and gain, as industrious, and as fervent in their love of photography, might have been pointed out, as was this French *professional;* and certainly English landscape photography—if we are to judge by results—was then, as now, decidedly in advance of the French.

International Photographic Company.—A somewhat novel idea has just begun to assume shape and form. M. Potonié, of Paris, has organised, or is organising, an International Photographic Company, the great purpose of which is to take the initiative in all matters which may "conduce to the security and prosperity of photography" as a branch of commerce. By its aid depots for the exhibition and sale of all kinds of photographs, photographic literature, photographic apparatus, chemicals, and other photographic goods, such as papers, frames, fittings, albums, cases, &c., &c., are to be established in all the principal cities of the world. The management and principal establishment will be at Paris, as being the more central spot for the purposes of importation and exportation. It is urged in the circular now before us that the extraordinary development of photography in all its artistic, scientific, and industrial phases, demands such an undertaking as the present to give full publicity to its many and continually-increasing improvements, applications, and more valuable productions, and to make their value more speedily and widely felt and appreciated all over the world. M. Potonié has secured for the Parisian establishment premises in the Rue de Bondy, 46, Boulevard Saint-Martin, and agents are already established in Berlin, Copenhagen, Warsaw, St. Petersburg, Moscow, Odessa, Breslau, Vienna, Madrid, Lisbon, New York, Adelaide, and Calcutta. The company will be composed of sleeping and active partners, each of whom will embark at least five hundred francs in the scheme. This, or any larger sum embarked, is to bear interest at the rate of five per cent. per annum, such interest to be deducted before any other claims are discharged from the funds of the company. An annual report is to be laid before the company for approval, and the profits are to be divided at the end of every year as follows:—Ten per cent. is to be put aside to form a reserve fund, which is never to accumulate beyond one hundred thousand francs, and at the end of the ten years—to which period the existence of the company is to be limited—this reserve fund will be fairly divided among the shareholders. After this, forty-five per cent. is to be assigned to M. Potonié as manager, and the same per-centage is to be divided among the shareholders *pro rata*. There are rules providing for other contingencies, such as the dissolution of the society, &c., into which it is not necessary here to enter. The scheme has many objectionable features, and not a few difficulties in the way of its being successfully carried out; but having laid it before our readers, we shall now leave it in their hands. In a private letter from M. Potonié, other features of more general interest to photographic students are touched upon, such as the probable establishment of an organ, to be called the *Cosmopolitan*, to be printed in all the chief languages of the world, and to collect into a focus all the various and isolated scraps of useful and important information which are now scattered so widely; but, considering that we now have more than one journal in existence doing precisely the same thing in this country, this portion of the speculation would not be quite so novel as M. Potonié appears to think it.

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

DRY PLATE PHOTOGRAPHY.

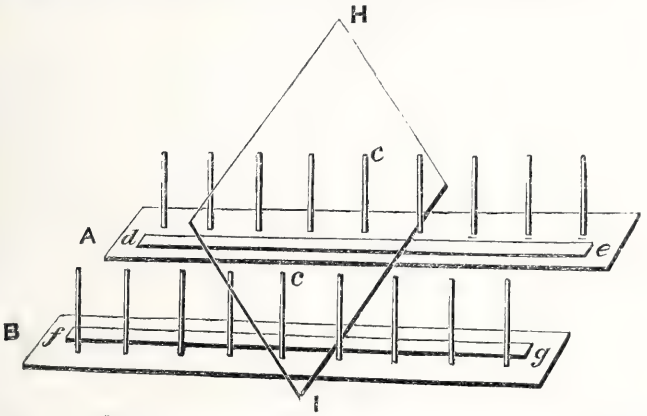
To the EDITOR.

SIR,—One of the most useful pieces of apparatus that I have is a rack for draining plates after the various operations of gelatinising, washing, &c.

Although you have described several, yet (perhaps from a prejudice akin to that of the crow, who always thinks her own offspring the fairest) I fancy you would serve your readers by an insertion of this description.

Take two strips of half-inch deal (A and B) say thirty-six inches long and two inches broad. At distances of one and a-half inch insert pieces of varnished wire or rods of glass (*ccc*) about four inches long. Lay along the bottom of each row of these pegs strips of glass (*defg*) for the plates to rest upon.

A sketch will remove any misconception of the above details.



H I is the prepared plate resting on the strips *defg*, and touched on the back at the points *cc*.

It will be seen that this rack will suit any sized plate.

For washing plates after sensitising I have a long wooden tank, with racks like the above fixed to the bottom. The tank is filled with water, the plates stand on the rack, a cover fits on the top making the whole light-tight, and the plates may be left to soak for any length of time. I like this plan much better than that by dishes.—I am, yours, &c.,

D. HORNBY.

A SICK BATH.

To the EDITOR.

SIR,—"T. G. P.'s" failures, described in No. 171, so closely resemble mine that I venture to call your attention again to the subject, and, by giving you a little more detail, hope you will be able to put us on the right road for amendment.

My bath had stood idle for three years, was acid, and gave foggy pictures. I shook it up with a little oxide of silver, and exposed it for a week to light. I could not detect any change, the oxide of silver alone falling to the bottom. After filtering I carefully made it slightly acid with nitric acid, and succeeded in getting some beautifully-delicate, sharp negatives, but no intensity in the sky, it being almost clear glass (a longer exposure gave fog). This was with Ponting's collodion and following iron developer:—

Protosulphate of iron	30	grains.
Glacial acetic acid	30	minims.
Alcohol	20	,,
Water (distilled)	1	ounce.

I then tried to intensify with the following, first washing thoroughly:—

Pyrogallic acid	10	grains.
Citric acid	5	,,
Distilled water	10	ounces.

To every drachm of pyrogallic I added four or five drops of forty-grain solution of silver, and the result was an immediate precipitate of an orange colour, afterwards changing to black, which covered the plate. I quickly washed away the precipitate, and noticed that the clear glass was slightly tinged yellow. Fresh solution mixed in a clean glass gave the same precipitate, but the glass was now of a deeper orange but no more intensity in the lights. By washing and applying fresh solution the plate became covered with a black muddy fog, and the clear glass a *deep orange*. In other cases I doubled the quantity of acid and lessened the quantity of silver, but with the same result. I then tried the following developer as an intensifier, with three or four drops of silver:—

Pyrogallic acid	1½	grain.
Citric acid	¾	,,
Alcohol	20	minims.
Distilled water	1	ounce.

But the old fault remained. I also prepared a fresh bath as under:—

Nitrate of silver	30	grains.
Glacial acetic acid	½	minim.
Alcohol	15	minims {is not this too much?
Distilled water	1	ounce.

The result still the same. It may be suggested that I should try a pyrogallic developer alone, but I wish to work with a short exposure.

I am desirous of recovering silver from waste solution, but cannot obtain sulphide potassium, grape sugar, or caustic soda. What is the latter? can it be the common pearl ash? Will loaf sugar answer in place of the grape? and how can I prepare the sulphide of potassium?

I hope you will not think me unreasonable in asking so many questions, and cast my queries into the fire, but rather take compassion on ignorance. I am, yours, &c. I. T. R. Y.

August 6th, 1862.

[An acid bath will not give foggy pictures, unless there be organic matter present; and, if it were acid, as you state, the oxide of silver would at any rate be partly consumed in uniting with the acid. However, you seem to have got the bath pretty well in order, but your trouble appears to arise from deficiency of strength: a bath three years' old is likely to be materially reduced in strength. The intensifying developer has insufficient citric acid, in proportion to the pyrogallic; for the present weather you may double the quantity of the citric acid, leaving the other ingredients as before. This is shown by the solution turning dark on adding the silver solution: it should remain perfectly clear in the dark room for at least a minute and a-half to two minutes, or there is not enough citric or acetic acid.

For what—in the name of all that is photographic—did you add alcohol to your silver bath? It is a great mistake, and we do not approve of the addition of acetic acid either.

Where can you be located, not to be able to procure the chemicals mentioned? Any one who deals in photographic chemicals will be sure to keep them. It would be quite useless to give you instructions for preparing sulphide of potassium, as you are evidently not sufficiently acquainted with chemical manipulation to perform the experiment. Pearl ash is not a salt of soda, but of potash. Loaf sugar cannot be substituted for grape sugar to reduce silver, but you may obtain the latter from honey by washing it with alcohol, which dissolves the syrup, and leaves the grape sugar in a somewhat crystalline form; but you had better procure it ready prepared, as well as your other chemicals. See advertisements. —ED.]

NOT "ACCORDING TO COCKER."

To the EDITOR.

SIR,—Allow me, as a constant reader of your Journal, to ask whether there are not some errors of print or otherwise, in the article *On Albumen*, by James Martin, in your number for July 1st.

1. I read, page 251, "*Composition* (of pure albumen).—C_{400}, H_{620}, N_{100}, O_{120}, P, S_2." "*Equivalent*.—5412."

How is this equivalent number obtained from the given formula? I make by it 5444, thus:—

C_{400}	=	2400
H_{620}	=	620
N_{100}	=	1400
O_{120}	=	960
P	=	32
S_2	=	32
		5444

2. In page 252, I read:—"The last column of figures on the right hand gives the average constitution of proteine obtained from various sources, and the analysis of which has been conducted with great care; and, if to this be added 0·4 phosphorus and 1·6 sulphur, we shall have the per-centage composition of *pure albumen*."

As the phosphorus and sulphur to be added will be equal to 2, and as the last column is already 100 (being the per-centage composition of proteine), the addition I make out will be the composition of 102 of albumen, and not of 100 as stated.

3. *How are the numbers obtained* in the column headed "Atomic weights?" The formula given at the commencement of the article is simply these numbers increased *ten*-fold. Why, then, is the added phosphorus and sulphur increased in the formula in *different* and *differing* proportions—the former *eighty*-fold, and the latter by merely *the addition of a fourth*? —Your kindly enlightening me will oblige, AN IGNORAMUS.

[We have handed the preceding note to Mr. Martin, the author of the article cited, and append the following as his reply.—ED.]

1. The sum is not *added up* "according to Cocker." Thanks are due to "Ignoramus" for pointing it out.

2. For per-*centage* read *average*. Accuracy in stating the composition of albumen was not aimed at, nor indeed in view of the following facts

does it seem possible. Berzelius (who himself quotes from Mulder) has the following in his *Traite de Chimie*:—"On burning albumen in the combustion tube with oxide of copper, mixed with oxide of lead to retain the sulphur in the state of sulphate, the following results are obtained:—

	Found.	Atoms.	Calculated.
"Carbon	54·84	400	54·70
Hydrogen	7·09	620	6·92
Nitrogen	15·83	100	15·84
Oxygen	21·23	120	21·47
Phosphorus	0·33	1	0·35
Sulphur	0·68	2	0·72"

In the *second* edition of Fownes's *Manual of Chemistry*, published in 1848, at page 536, the preceding analysis of albumen by Mulder is again quoted, *but* the following formula deduced therefrom:—C_{400}, H_{310}, N_{100}, O_{120}, P, S_2. When such doctors as Mulder, Berzelius, and Fownes disagree, I must confess myself unable to decide; and such, indeed, would seem to be the feeling entertained by the editors of the later editions of Fownes's *Manual*, Doctors H. Bence Jones and A. W. Hoffman, who, doubtless, sensible of the caution and reserve with which the formula of albumen has been received by chemists, in the *sixth* edition of that work, which I have before me, furnish only the per-centage composition, and abstain from deducing any formula therefrom.

3. The numbers given in the article in question are correctly quoted from Mulder's analysis, published by Berzelius, and obtained by him, no doubt, in the usual manner followed when it is desired to deduce a *rational* from an *empirical* formula. For details on these points "Ignoramus" should consult some elementary work on chemistry.

INDICATION BY COMMENDATION.

To the EDITOR.

SIR,—Having left town just after writing you the note which appears in your journal of the 15th ult., I did not see your comments thereon till this evening. My communication was written hastily, and in an off-hand, unpremeditated manner, intended merely as a gentle remonstrance to yourself, and not as a formal accusation of either favouritism on the one hand or injustice on the other. I ought, perhaps, to have been more particular in my expressions. I should not, for instance, have used the word *constantly* as applicable to your praise of Mr. Williams; for I certainly am not prepared to respond to your challenge of looking out number and page where you have mentioned his name. I can only say that I am a very regular reader of your Journal (which no one values more than I do), and that the impression left on my mind is that you have very often lately spoken of Mr. Williams—or, what is the same thing, allowed your contributors to do so—in a way that has led me to believe that you recommend him as our best portrait photographer. Now I repeat that I do not for one moment question Mr. Williams's excellence: all I question is the propriety of extolling him by name in a public journal devoted to photography. Of course your readers suppose you to be a first-rate judge of such matters, and there could be nothing unfair in your recommending any one as earnestly as you might choose *in private;* but I still think it is unfair to do so, or to say anything which appears like doing so, in public print. I can say, for instance, for myself, that, from what I have read in your Journal, I shall recommend Mr. Williams, and I don't think I should have done so otherwise, simply because I have never happened to see any of his productions. As for M. Silvy, I had no idea that he wrote, or was in any way accessory to the writing of, the article in *All the Year Round;* and, if it be true, I can only say he ought to be ashamed of himself, and that he is placed far beyond the pale of *my* sympathy. I still contend, however, that he has published some *cartes de visite* which are very beautiful. Compare his portraits of the late Prince Consort and the Princess Alice with any others published of the same. Is there *any* comparison? But this is, perhaps, irrelevant. All I complained of (if you can call it complaining) is the praising or dispraising any one by name in a public journal supposed to be an authority on the subject. Even in this, however, I freely admit that my opinion is valueless in comparison with that of an experienced editor like yourself; and, if I have given offence by the expression of my ideas, I beg to apologise, and assure you that no one appreciates the manner in which your Journal is conducted more than yours, &c., AN AMATEUR.

[No apology whatever needed: we are always glad to have an outside opinion. We do not assert that M. Silvy wrote the article we quoted; but we have a strong opinion that it was written for him, or at his instigation, and that is all we stated. We have not seen the portraits to which you allude, and therefore cannot make the comparison; but we have seen, only yesterday, one, by M. Silvy, of the Prince of Wales, and readily accord to it our highest commendation: it is very good indeed. If you will again refer to such articles as contain the mention of Mr. Williams's name, we apprehend that you will find the approval is accorded to works *publicly exhibited* by him: how then can they be indicated with propriety except with his name attached?—ED.]

ANSWERS TO CORRESPONDENTS.

*** Several articles are left over, owing to pressure on our space. Among these are—*A Bit of Chat about Glass Houses*—*The Photographic Apparatus and Appliances at the International Exhibition* (by S. Highley)—A reprint of the new Act relating to Copyright in Works of the Fine Arts, &c., &c.

ERRATUM.—Norbiton—and not Narbiton, as printed in our last—is the proper name of the locality where Messrs. Russell Sedgfield and F. G. Eliot's photographic printing establishment is situated.

F. T. C.—See number 170.

C. W. SMARTT.—Received, with thanks.

GEORGE COOMBE.—Received. Inquiries being made.

C. REDMAN.—We are obliged for your offer, but must decline it with thanks.

R. D.—Disease: "Photographic measles." Remedy: Stronger solution of hyposulphite of soda for fixing.

AUGUSTE LEMOINE.—Recevez nos meilleurs rémerciements pour votre complaisance; les nouvelles seront bien interressente.

R. J. F.—The connexion hinted at "may or may not" exist; but we believe such "puffs direct" from the quarter indicated have little or no weight with the sensible portion of the photographic public.

CHARLES DAVIS.—A quiet hint was tried in vain upon more occasions than one. If you will forward the letter we will address it for you, so that it shall reach the gentleman indicated; but he objects to have his address given to strangers.

J. H. S.—Add dilute nitric acid continuously as you propose. An hour's exposure will do unless there be a large quantity of organic matter. It is a good plan to leave the bottle in the light all day, and pour off and filter on the following one.

W. H.—We have not *overlooked* the personal remarks to which you allude; but we invariably disregard everything of the same kind. We have little doubt that the writer entertains the poor opinion which he expresses; and, at any rate, in England every man has a right to his opinion, and usually expresses it. We shall most certainly not retaliate.

W. H. W.—The loss which you have sustained is serious. We fear the damage sustained by photographic exhibitors generally, owing to the effect of the damp walls of the "garret" on their pictures, will be considerable. It is a matter of regret that the Commissioners cannot be made liable for the wilful neglect of precautionary measures in anticipation of the ravages of the insidious enemy. The exercise of a little judicious foresight might have prevented such sad results.

——? (Montrose).—We cannot at all make out your initials, and have had a tough job in deciphering your query; but have at length come to the conclusion that you desire to know whether we advise a single or double combination lens for instantaneous sea and sky subjects. It is a class of subject upon which we have not personally experimented; but our opinion, based upon the results obtained by others, is decidedly in favour of *good single lenses* for this kind of work.

W. & P.—Artistically, enlarged positives are better than those taken of a large size at once by means of a large lens, and there is no end of advantage to the sitter. For colouring, especially, the advantage is all on the side of enlargement. A quarter-plate lens of either of the English makers you name will do for both purposes: the other makers' lenses are also excellent, but we prefer those of our own countrymen. Your note was forwarded to the address of the Publisher, who will reply privately to your business query—that not being in our department.

R. F.—The whole affair of Jury awards in the photographic department (so far as the pictures are concerned) is, in our opinion, such an absurdity as to put it beyond the pale of criticism. The Jurors had a difficult task to perform; but it was perhaps impossible for one, or even two, to make head against their coadjutors, backed by the Royal Commissioners, or the best plan would have been to have abstained entirely from awarding medals for the *pictures*, and to have apportioned them amongst the exhibitors of apparatus and chemicals only. This would have been a just rebuke to the Commissioners for their absurd classification.

J. BRAY.—We fear that the accident which you describe has quite unfitted your silver solution for the purpose to which you apply it, and unfortunately there is no remedy for it but reducing the silver, and reconverting it into the nitrate anew. First add to it some liquid ammonia, just enough to make it *slightly* alkaline; expose it to the sun-light; a dark-coloured precipitate will fall; filter this out by aid of blotting-paper; then dissolve some protosulphate of iron in distilled water, and add it to the solution. The silver will be thrown down in the form of a brilliant whitish powder. Wash this white powder in several changes of water, allowing it to settle between each change; then add dilute nitric acid, and, by the assistance of gentle heat, dissolve the powder. The solution will be nitrate of silver.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 173, Vol. IX.—SEPTEMBER 1, 1862.

Photolithography.—Mr. Macpherson—whose illustrations of Rome we noticed in our last as forming an exhibition at Conduit Street, Regent Street, London—has been successful also in the practice of photolithography; and, in a conversation which we recently held with him, he was good enough to describe his method of working, at the same time giving permission for its publication for the benefit of the art. As in many instances with valuable processes, this one also is enhanced by its simplicity, as the following description will demonstrate:—

Take a lump of bitumen of Judea (Jew's pitch), about the size of a walnut, and put it into a bottle, after having slightly broken it up. Pour upon it some ether—say about half filling the bottle—and shake the whole well up for several minutes. The ether will, of course, become coloured by dissolving a portion of the bitumen: this is to be poured off into another bottle, and is not of any service in photolithography, as it contains certain resinous matter not sensitive to the action of light. A second portion of ether is now to be added, the bottle well shaken up, and the bitumen allowed to settle. It must be repeatedly shaken, and left at rest many times during the day, and on the following one may be poured off for use. It is with the dark-coloured liquid thus prepared that the sensitive film is obtained.

A lithographic stone, properly smoothed and prepared as if for use in the ordinary manner, must next be procured, and is to be coated on the surface with a film of bitumen by pouring on its etheral solution, just as if forming a film of collodion. When dry, it is to be covered with a negative photograph on glass, and exposed to direct sunshine, if possible, for about an hour (more or less, according to circumstances), and is then to be removed, in order to fix the image which will have been formed. The negative should be one with abundance of detail, and free from fogging or other defects.

The fixation of the image is effected much in the same way as in other photographic operations—that is, by dissolving out the unaltered sensitive medium; and in the case before us this is readily performed by aid of the menstruum originally used for holding it in solution while coating the stone, viz., ether. But as this liquid evaporates with great rapidity, and it is requisite to take precautions against unequal action, we have to conduct the fixing process in a peculiar manner. For this purpose we make use of a gutta-percha tray or dish, very little larger than the dimensions of the stone to be operated upon. Two pieces of stout string are tied completely round the stone, one near to each end; and, for convenience, a third piece may be extended at the back of the stone, joining the other two, so as to act as a handle wherewith to raise the stone.

A sufficient quantity of ether to fill the dish to a depth of about one quarter of an inch is then to be poured in, and the impressed stone immediately to be inserted therein, face downwards, the pieces of string being sufficient to keep the face of the stone from coming in contact with the bottom of the dish. The whole is then to be waved gently backwards and forwards with a rocking motion, so as to cause the ether to wash the face of the stone free from the unaffected bitumen; after which the stone must be quickly raised, and turned face upwards, and a small quantity of fresh ether, kept in readiness for the purpose, must be dashed over the face of the stone, in order to prevent a new deposit from the evaporation of the ether which has just been used to dissolve off the superfluous bitumen. An ounce or so of ether, in a glass beaker, will answer for this purpose; and, until required for use, evaporation may be checked by keeping the beaker covered with a piece of glass.

If the various manipulations have been correctly performed, a very perfect positive impression of the original should now be visible upon the stone, and nothing further is required of the photographer; but the stone may be handed over to the lithographer, to be treated with acid and gum-water in the ordinary way,—the impression readily taking the ink from the roller.

We are informed by Mr. Macpherson that by this process every detail and proper gradation of half-tone can be obtained. His visit to London having been hastily undertaken, he did not bring with him his specimens; but he assured us that he had not seen photolithographs produced by any other process that equalled them in these respects.

It will, of course, be perceived that there is one drawback to the results obtainable as above described. The subject is necessarily reversed, as regards right and left sides; but this is a defect that can be met by taking negatives on purpose through the glass, instead of on the surface next to the subject.

To those of our readers who have a little time to spare, and are desirous of engaging in a promising field for experiment, we heartily commend a trial of this process, as likely to afford them much gratification. One recommendation that it possesses above most other photolithographic processes is, that it does not of necessity demand a knowledge of lithographic manipulation in the photographer.

Qualitative Analysis.—Amongst photographers, as a class, the majority are totally unacquainted with the science of chemistry; but of a large proportion of this majority many are eminently qualified to receive instruction therein, provided it be offered in an attractive and practical form. The desirability of making photographers acquainted with chemistry, as a science, we presume but few of our readers would question; and the habit of neatness and care in manipulation needful in photographic pursuits is conducive to facility in performing chemical operations; while the craving for information on chemical matters is evinced by the very numerous inquiries we are called upon to answer in every number of the Journal. As a step towards meeting an ever-increasing demand, we propose commencing a short series of initiatory articles *On Qualitative Analysis*, with a special view to affording assistance to our readers in testing the quality of the chemicals with which they have to deal; and to this end we have made arrangements with

a gentleman particularly well qualified to impart information of the kind desired—Mr. Emerson J. Reynolds—to write a short series for this Journal especially calculated to convey the requisite knowledge in a clear, concise, and natural manner. The enunciation of a proposition, followed by a demonstration, is generally pretty readily understood and remembered, and a step is gained which forms a firm starting-point for a further advance. At certain points we cannot progress without the aid of various pieces of apparatus, but by constructing these as they are required, and explaining their object to the students, we attain our end without requiring them to be embarrassed with them from the commencement of the journey. This is sufficient to indicate the course in contemplation, and we have only further to add that the first article of the series will be found at page 325.

Auld Lang Syne.—It is with no little gratification that we find ourselves enabled to present our readers with a contribution from the pen of our much-esteemed friend and late *collaborateur*, the Rev. T. F. Hardwich, who has for the last twelve months or more been restrained from indulging in photographic pursuits by the more urgent demands of duties of a higher calling. We are sure that our readers will accord a hearty welcome to one who has been called with truth "the photographer's best friend;" and we trust that, having once again "broken the ice,' he may now and then "put in an appearance" in our columns'

Photography in Glasgow.—We are happy to have it in our power to announce that the City of Glasgow is no longer without its Photographic Society. Our readers will recollect that the old Society was dissolved last May, and that at the time we notified this fact we stated that steps had been already taken to constitute one as its successor. This is now *un fait accompli*, and the new Society, instituted in the month of June last under the designation of the Glasgow Photographic Association, will hold its first meeting for ordinary business at No. 75, St. George's Place, Glasgow, on Tuesday, the 4th instant, under the Presidency of Mr. Kibble, upon which occasion he will deliver an opening address.

One of the Vice-Presidents has promised to give an account of a summer excursion with the panoramic camera, accompanied with illustrations of its use; some specimens, the result of a new process, will be exhibited; Mr. Spencer has promised to bring forward a new system of mounting lenses and other apparatus;—so that the bill of fare is an attractive one. Moreover, we have authority to intimate that gentlemen desirous of joining the Association are invited to attend, and will be received with a welcome. That the Society promises to be an active one we think will be admitted, especially when the names of those gentlemen holding office are known, a complete list of whom we append, viz.:—*President*, Mr. Kibble; *Vice-Presidents*, Messrs. Mactear and Macnab; *Treasurer*, Mr. Archibald Robertson; *Hon. Secretary*, Mr. Edmund Brace; *Council*, Messrs. J. Spencer, Jun., Duncan Brown, J. Stuart, A. Robb, J. Ewing, and J. Jex Long.

PHOTOGRAPHIC TROUBLES: THEIR CAUSES AND REMEDIES.

Dear Sir,—At the time we were working together in the conduct of the Journal I promised you that I would note down anything of interest which occurred to me, and occasionally send you a communication. I am sorry, however, to say that I have done very little photography this season beyond giving a general superintendence and advice to a friend residing in the neighbourhood.

Card-portraits appear to be as much in demand as ever, and it is evident that the bromo-iodised collodion succeeds remarkably well for pictures of that size. Working, as we have done, on small plates, no difficulty was experienced with the pyroxyline: any variety giving sufficiently intense negatives answered. If my practice in the art had always been similar, much vexation might have been spared, and various matters relating to flowing qualities, adhesiveness, straight lines, and a thousand other inconveniences, allowed to take care of themselves; for the sulphate of iron developer ensures the adhesion of the film, and if unevennesses and waves of bath solution are seen before development, they will not, as a rule, be visible afterwards. The iodide of silver, used alone, has many disagreeable propensities as regards developing; but when combined with the bromide the reduction of silver is rarely irregular. I quite agree with Mr. Dawson that the most exquisite sensitiveness is obtained by the iodide alone; but in this case there are many objections, for the pyroxyline suitable to such a result is a contractile kind, giving no intensity, and very liable to mishaps in development. A beginner would spoil the majority of his pictures by using it; and if he attempted to add to the intensity by employing an "organic" pyroxyline, so termed, all the extra sensitiveness would be lost, and the bromo-iodised collodion would then work more rapidly than the simply iodised. Taking everything into account, the bromo-iodised is evidently the better collodion for the card-pictures, and the definition is, as a rule, superior. I see, by examining the albums, that some operators still employ simple iodide; but the majority are evidently in favour of the combination.

My friend encountered a difficulty at the very outset: his first half-dozen pictures, in a new bath, developed well, but those that followed were covered with transparent pin-holes. Half-an-hour's consideration made it perfectly certain that the holes were caused by little pointed crystals of iodide of silver which slowly separated from the bath solution and projected visibly from the surface of the film. At least four minutes are occupied in forming these crystals, so that if the picture be completed in two minutes from the time of dipping the plate there are no spots. In three minutes they show slightly, whilst in six minutes the plate is thickly studded with them. If my memory serves me it was Mr. Thomas, of Pall Mall, who, several years since, attributed these spots to supersaturation of the bath with iodide of silver; but the question is whether a new or an old bath is the more liable to it. My experience teaches me that it often occurs in a newly-mixed solution, saturated with iodide in the usual manner, and then weakened by dipping many plates successively. The first pictures are clean, the last spotted; and if the bath be set aside until the following morning, it will correct itself, and the balance be restored by a deposit of iodide on the sides of the gutta-percha trough. Organic matter in the bath will enable it to retain more iodide of silver in solution—even alcohol exercising an appreciable influence in that direction. The spots disappear at once on adding to the bath a fifth part by bulk of a simple thirty-grain solution of nitrate of silver; but as this cannot always conveniently be done, it is well to know that the same object may be attained by working quickly and finishing the picture before the crystals have time to form.

Another difficulty was the following:—The negative became injured on applying the spirit-varnish. When the chemicals were newly mixed all went well; but, after a few weeks' keeping had caused a little decomposition and discolouration of the collodion, the varnish was found to attack the film. Those who study the chemistry of pyroxyline are aware that the varieties of that substance standing low in the series (near to xyloidine) dissolve in strong alcohol, but that the higher members do not. In collodion iodised with alkaline iodides there is a constant descent of pyroxyline from high to low, oxides of nitrogen being liberated, and entering into combination with the base in the form of an alkaline nitrite. Hence we can understand why a newly-mixed collodion should yield a film capable of resisting the varnish; whilst the same, after keeping, partially dissolves. The remedy which my friend found most satisfactory was the addition of *half-a-drachm of water* to each ounce of the varnish, so as to reduce the strength of the spirit to that point at which it loses its solvent action on the weaker kinds of pyroxyline.

I am sorry not to be able to send you a longer contribution; but placed as I now am in the midst of a population of 5,000 workingmen, I find it impossible to give the art that attention which is necessary for successful experimenting. Yet I may truly say that, although unable to take many pictures, I still retain pleasant reminiscences of photography, and recall old friendships with even more gratification than at the time experienced. Thus do we live in the past and in the future quite as much as in the present.

T. F. HARDWICH.

ON THE NATURE OF THE PHOTOGRAPHIC IMAGE.

By George Dawson, M.A.,
Lecturer on Photography at King's College, London.

It is easily demonstrable that the decomposition of any haloid salt of silver such as the iodide, bromide, &c., by the combined

action of light and what is usually called a developer, resolves it into metallic silver. On this point there is no dispute. A drop of nitric acid on a photographic image developed by gallic or pyrogallic acid, protosulphate of iron, or any other substance having a strong affinity for oxygen, will at once demonstrate the solubility of the deposit, and another drop of hydrochloric acid will convert the newly-formed nitrate into chloride of silver. It is not easy to trace the part played here by actinism, nor what molecular invisible change it has effected in the sensitive film. We only know that it is of such a nature as to encourage a deposition of silver from the nitrate present in the film or added thereto with the developer, and that in proportion to the duration and intensity of its action. If it were possible to ascertain the fact it would probably be found that the amount of pure iodide of silver in a sensitive film is the same before exposure to light and after the image has been fully developed, the metallic or opaque deposit being entirely derived from the free nitrate. Many circumstances favour this view. The actinic effects alone may not be, and generally are not, visible till the reducing agent has been added, and then only when nitrate of silver is present and has been decomposed. It is a singular fact connected with this that the haloid silver salts are sensitive to the direct action of light, so far as we can see, in an inverse order to their capability of producing a dense precipitate by the combined action of both light and a developer. Take, for instance, the two extremes—the iodide and the chloride of silver. However long we expose the former to light the visible effect is scarcely perceptible, but a momentary exposure followed by a developer in contact with free nitrate of silver ensures instant decomposition. With the latter it is very different. The prolonged action of light does indeed, more or less, visibly affect them all under certain conditions, but the nature of this change we can only at present guess at. The chloride blackens readily in daylight, but nitric acid or any other test we may apply fails to detect the presence of oxide or of metallic silver, and although many attempts have been made, both directly and indirectly, to ascertain the precise nature of the reduction, we are still very much in the dark. We know by most undoubted evidence that light abstracts chlorine from the chloride, thereby effecting some sort of decomposition; but whether by continued action it has the power of removing the whole, is the question not yet satisfactorily answered.

The following experiments bearing on the point were commenced in the early part of last year, and would have been published sooner had I been able to complete another series of a confirmatory kind, which, being interrupted by unforeseen circumstances, cannot now be proceeded with, this season, on account of the long-continued daily attention required to ensure a reliable result. They were made in the strictest good faith, with no bias on my mind towards the subchloride, metallic, or any other theory.

Experiment *A*.—In a Winchester quart bottle, made of thin and very transparent glass, were dissolved forty grains of pure nitrate of silver in forty ounces distilled water.

Experiment *B*.—In a similar bottle was dissolved an equivalent weight (fourteen grains) of chloride of sodium in the same amount of distilled water.

Experiment *C*.—The same as *A*, with the addition of one grain of gelatine dissolved in the water.

They were all exposed on the projecting ledge of a wall, directly facing the south, from about the 20th of March to the 15th of June, 1861, without intermission, and protected from the ingress of rain and other extraneous matter by loose cone-shaped covers, like extinguishers, placed over their mouths. Every morning during that period (not more than four or five days excepted) a small portion of very dilute chloride of sodium, in distilled water, was added to *A* and *C*, and a similar solution of nitrate of silver to *B*. The bottles were then well shaken up, and left in the light. In very bright weather, if the finely-divided chloride had nearly subsided before evening, the bottles were again shaken up, for the purpose of exposing the greatest possible surface to the action of the light, but no more silver nor sodium salt added.

In *A* and *C*, where the nitrate was in excess, turbidity never entirely ceased during the hours of daylight; but the liquid was always clear and transparent in the morning. Than this, nothing could more beautifully show the action of the disengaged chlorine in decomposing the free nitrate—an action always more energetic during the hours of brightest sunshine, and gradually ceasing towards nightfall. After a few days both had a decidedly acid reaction, and gave other evidence of the presence of nitric acid in a tendency to agglomeration of the precipitated chloride into clots.

On the other hand, in *C*, which was also acid from the formation of hydrochloric acid, the latter peculiarity was not so discernible, and the precipitate had always subsided within a few hours, without reference to the brightness of the day. Another fact worth noticing in the course of the experiment was the difference of colour in the blackened precipitate of each of the bottles. In the course of a week or so, in *A*, it had assumed a deep dead black. In *B*, the same with a slight tinge of blue. These characteristics they retained to the end. In *C*, which contained organic matter, the precipitate was black for some time, but gradually began to bronze, till at the end of the experiment it presented a dark coppery metallic lustre.

At the beginning of June *A* and *C* still contained a slight excess of nitrate of silver, and *B* of chloride of sodium. From this time I ceased adding any more chloride to *A* and *C* and nitrate to *B*, partly for the reason that the bottles were now full, and partly because I wished each to retain an excess of its original salt, so long as they were exposed to daylight. But I still continued them in the sunshine for another fortnight, shaking them up daily as before.

(*To be concluded in our next.*)

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.

By Emerson J. Reynolds.

In analytical chemistry, as in all other sciences, the progress of our knowledge has been slow but sure. We no longer burn the midnight oil in toiling after what we now know to be a "delusion and a snare;" and yet, to the labours of those veteran pioneers of science, the alchemists, we owe a great amount of our information, regarding the deportment of metallic bodies one towards another—in fact, many of the reactions by which we distinguish substances in the present day were in reality discovered in ages gone by, while endeavouring to torture the baser metals into gold. Since those early times, young science has been daily gaining strength and vigour until, in the present day, we may truly be somewhat proud of the beautifully philosophical method of analytical research of which we are now in possession. It is with the view of assisting those of our readers who are anxious to make themselves acquainted with the elements of qualitative analysis that we write the following paper. It shall be our endeavour to so treat the subject as to render it easily comprehensible by those who are but slightly acquainted with chemistry, and to enable them to follow up the study both as a youthful acquirement and an agreeable recreation.

Without further preface, we shall commence with a few words about apparatus.

The apparatus required in qualitative analysis is of an exceedingly simple and inexpensive nature; in fact, many of the articles in domestic use, such as tumblers, wine-glasses, saucers, &c., together with a small spirit lamp, a little glass tubing, and a few test tubes, will be found sufficient for almost all analytical operations. However, as some of our readers might probably wish to obtain their apparatus regularly from the instrument makers, we subjoin the following list:—One dozen test tubes, test tube stand, filtering-paper, spirit lamp, litmus-paper (blue and red), small retort stand, two or three small glass funnels, platinum wire and foil, blowpipe, two small German beakers, porcelain crucibles, glass tubing, glass rod, file, evaporating dishes, and wash bottle.

With a little ingenuity the student might easily substitute for, or dispense with, many of the pieces of apparatus enumerated above, and use those made by himself from simple and inexpensive materials. Thus, a spirit-lamp may be constructed by taking a small two-ounce phial and fitting it loosely with a cork, which is then to be perforated by means of a redhot wire, and the passage thus made enlarged by a round file until of a sufficient size to admit easily a piece of glass tubing, about the one-eighth of an inch internal diameter, and two inches long. The glass tube is now pushed through the aperture in the cork, and it then only remains to pass some cotton wick through the tube, nearly filling the phial with the spirit generally known as "finish:" insert lightly the cork, carrying the tube and wick, and—light your lamp. Again, to take another example:—A capital blowpipe may be made by taking an ordinary tobacco pipe and fitting the bowl with a cork, which is then perforated as before described, and a tube about two inches long introduced: this tube having previously had one extremity drawn out, in the flame of the spirit-lamp, to a fine point, the cork is then placed *in situ*, with the fine point of the tube projecting outwards, and the blowpipe is finished. With these two instruments we can then mould brass tubing into numerous useful pieces of apparatus, viz., test tubes, retorts, receivers, tube-funnels, &c., with some practice and a small amount of skill.

Such is a brief and necessarily very imperfect notice of the apparatus required in pursuing qualitative analytical investigations; however, we prefer to postpone the description of many pieces of apparatus until such time as they may be essential to the performance of the analytical process. We, moreover, intend to adopt, to some extent, the same plan in speaking of the method of performing the several operations of filtration, decantation, evaporation, fusion, &c., for two reasons:—In the first place, our space would not permit of our treating this part of our subject in detail; and, secondly, it would be to a considerable extent superfluous information, as photographers are continually in the habit of making use of these methods of separation, solution, &c., in the daily practice of their art. However, when any particular treatment is necessary in the course of analysis, we shall specify the method to be adopted.

We cannot impress too strongly on the mind of the student the necessity of cultivating habits of extreme cleanliness, neat and delicate manipulation, together with care and accuracy in the observance of results. "Nothing," says Dr. Johnson, "is to be considered a trifle, by which the mind is inured to caution, foresight, and circumspection. The same skill, and often the same degree of skill, is exhibited in great and in small things."

Qualitative Analysis may be defined as being the means whereby chemists are enabled to ascertain the existence in a body presented for examination of one or other of the constituents of the solid crust of the globe, without any reference to the relative proportions in which they may exist in the compound. Systematic qualitative analysis teaches a fixed scheme of procedure, of a purely inductive nature, by means of which, and the application of a few simple tests, we ascertain with certainty not alone the *presence*, but likewise what is often of equal importance, the *absence* of whole classes or groups of bodies.

Every reader of this Journal is, doubtless, well aware that the whole inorganic or mineral world is divided into two great sections, bases and acids—bases, such as potash, lime, or oxide of iron, having the power of uniting with acids, as sulphuric or nitric, with greater or less degree of energy or intensity, the result of the union in each case being the production of a neutral "salt," which is well exemplified in the sulphates or nitrates of potash, lime, or oxide of iron, in which the prominent properties, both of the acid and base, are completely destroyed, thus forming a connecting link between the two great classes. It is to be remembered that many different kinds of "salts" exist, such as double salts, acid, and basic salts, sulpho-salts and many others, about which we shall have something to say hereafter; for the present, when we speak of a "salt," we must be understood to mean a vinary compound possessing all the characters of strict neutrality, unless otherwise specified. In qualitative analysis it is the custom to make two separate examinations of the compound presented for analysis: one for the detection of the base or bases present; the second for the discovery of the nature of the acid or acids existing in combination with the basic constituents. Now, before enumerating the metallic bases and describing their distinctive characters, it may facilitate the comprehension of what follows if we state briefly the more important principles on which chemical analysis is based. For this purpose, then, it is to be understood—

1. That a salt is a compound of either two simple atoms—as chlorine and sodium in common salt—or else of two active compound molecules—as oxide of silver and nitric acid—which, when united, form the well-known salt, nitrate of silver. Either of these forms of combination is termed a "vinary compound."

2. When two salts, such as nitrate of silver and chloride of sodium, are dissolved separately in water, and the solution then mixed, under certain circumstances, a complete transposition of the constituents takes place, giving rise, in this particular instance, to the formation of chloride of silver and nitrate of soda. This is known as "reciprocal decomposition."

3. If, as in the case just cited, the solutions of two salts be mixed which are capable, by mutual decomposition, of affording a compound insoluble, or nearly so, in water, no doubt need exist but that such a body will be formed. On the other hand, if they cannot yield a compound insoluble in water, it is yet a debateable point whether complete decomposition or interchange of particles takes place or not.

4. Potash, soda, and ammonia, by reason of their superior affinity for all acids, are capable of displacing the metallic bases from their combinations with them; but, if certain forms of organic matter be present, this decomposition will frequently be interfered with.

The basic groups are five in number, each group being composed of the following metals:—

First Group.—Silver, sub-oxide of mercury, lead.

Second Group.—*1st Division:*—Antimony, arsenic, tin, gold, platinum. *2nd Division:*—Mercury, lead, bismuth, copper, cadmium.

Third Group.—Nickel, cobalt, manganese, iron, zinc, uranium, aluminium, chromium.

Fourth Group.—Barium, strontium, calcium.

Fifth Group.—Magnesium, potassium, sodium, lithium, ammonium (?).

It may be observed that many metals are omitted from this list for the simple reason that they are scarcely ever met with, except in rare minerals, and never in photographic chemicals. The above arrangement of the basic groups is not in the least arbitrary, nor depending on the fancy of the chemist for its construction, but is based on strictly philosophical principles, derived from our knowledge of the deportment of these bodies when placed in contact with others termed "class re-agents."

In systematic qualitative analysis we do not apply tests at random to the substance under examination, but proceed in a more methodical manner. Each of the groups above mentioned possesses a re-agent peculiar to itself, by which some characteristic effect is produced. If, for instance, we add to a solution the re-agent for the first group, and observe no change, we pass on to the second; and if this test does not produce any alteration, we pass on to the third; and so on until we obtain a definite result, which we *must* do if the water holds any mineral matter in solution. This method of analysis, therefore, "consists in adding to the solution of a compound of five, six, or more constituents, successively, other substances which enter into combination with one or other of these constituents, forming insoluble compounds. This is done in a definite order, just as if each were contained in a different drawer, the opening of which required a particular key, appropriated to itself."* Such is the particular value of *class* or *general* re-agents, though their use can hardly be said to end here, since the *colour* of the precipitate produced often saves us the trouble of looking for several members of a group. Thus, the general re-agent for the second group precipitates seven of the metals as dark compounds, and four of a yellow colour; if now we are analysing a solution, and add the class re-agent for the second group, and we obtain a yellow precipitate, we may at once assert positively that neither of the seven metals which produce dark compounds can be present, so that, by the principle of exclusion, we at last arrive at the wished-for result, with a far less expenditure of time and trouble than if we proceeded in an irregular manner. There are likewise a number of re-agents called "special tests:" these are used to distinguish the individual members of each group one from the other.

We have now arrived at such a point that we may lay before our readers the plan we purpose pursuing in teaching qualitative analysis. In the first place, then, we shall endeavour to make the student thoroughly acquainted with the means of detecting each of the *groups* with ease and certainty; we shall then pass on to the detection of individual members of each group. The acids—both inorganic and the more common vegetable acids, which are likewise divided into groups—will then be treated of in a manner precisely similar to that adopted with the metallic bases. Then, after making a few observations regarding analysis in general, we may pass on to the use of the blowpipe as a quick and ready general test. And, finally, we shall have something to say relative to the newly-discovered method of "spectrum analysis," as applied to the detection of the constituents of the baser groups, founded on personal experience with the spectrum apparatus. In most works on analytical chemistry the student is first made acquainted with an immense number of re-actions of different bodies; and, though *afterwards* the connexion is pointed out, yet the author has frequently remarked the puzzled expression of a junior student if asked how he would separate one body from another, by making use of his knowledge of their special re-action. We are of opinion that qualitative analysis ought to be taught as it is practised in the simplest and most direct manner possible—not cumbering descriptions with unnecessary details, but inculcating general principles first and specialities afterwards. It shall be our endeavour not alone to follow this course but likewise to constantly keep in view the one particular object of applying analytical chemistry to the detection of impurity and adulteration in photographic chemicals.

REMARKS ON THE TANNIN PROCESS.

By John Glover.

If we may judge from the numerous inquiries that from time to time reach the editors of the publications devoted to photography

* Liebig.

and also those individuals who, having given their attention to the subject of dry processes, have arrived at any amount of success, it needs no apology in bringing the subject of the present article before the readers of this Journal.

It has been asserted, and with some degree of truth, that excellent results may be obtained with any collodion when preserved with tannin. There is, however, a great variation in the sensitiveness and in the quality of the resulting negative. In the course of my investigations I was somewhat surprised to find that some preparations of first-class manufacturers most rapid when used wet, on drying proved the most insensitive, and gave unsatisfactory delineation of foliage, though precaution was taken to add some bromide salt to the usual iodiser.

At the commencement of the present season I entered upon a series of experiments with a view to ascertain the most suitable pyroxyline, and the result of my observations is that the most sensitive collodion for the tannin process is one prepared from cotton immersed in a mixture of acids of a strength just above the dissolving point, at a temperature not lower than 145°.*

Pyroxyline	4 to 5 grains.
Washed ether	4 drachms.
Alcohol (805°)	4 „
Iodide ammonium	3 grains.
„ cadmium	1 grain.
Bromide „	2 grains.

The above collodion can be used immediately after preparation, but works much better a month after iodising, with no diminution of sensitiveness. The presence of a small amount of chloride is beneficial, but this can be either effected by adding it to the final washing bath or to the collodion. Whether this has any effect on the sensitiveness is a matter of doubt, but I am satisfied that plates so prepared retain the latent impression for a longer period without deterioration, thus enabling us to defer the development for fourteen days or more after exposure—a great stress off the mind of the enthusiastic amateur on a photographic tour. The collodion prepared as above is perhaps not quite so tenacious as one less sensitive. On plates larger than stereoscopic size it will not adhere to the glass with certainty unless a substratum be employed. By preference I still use a solution of India-rubber, which never fails in my hands. I would also strongly recommend, especially for large plates, previous to development, the application of dilute spirit, not so much on account of the extra safety of cohesion as for other advantages, which are obvious.

With regard to the numerous accelerators which of late have been suggested in the development, &c., of dry plates, more especially the process under consideration, I am inclined for the present to rely for sensitiveness more on the character of the collodion, the judicious use of restraining acid, and the presence of honey, decoction of malt, or similar substance in the preservative. What the vapour of ammonia may effect, as communicated by the correspondent of the *American Journal of Photography*, it is difficult to say.

With the above conditions fulfilled, the tannin process exceeds the "resin" or any other published process in rapidity, certainty, and excellence of result.

COATING AND SENSITISING THE PLATE.†

By M. D. Van Monckhoven.

The nitrate of silver bath is prepared by dissolving 2½ ounces nitrate of silver (fused) in 35 ounces of distilled or rain water, filtering the liquid, and pouring it into a gutta-percha tray. The collodion is spread upon the glass, which is presently plunged into the nitrate of silver bath: the film whitens by the transformation of the iodide of cadmium into iodide of silver, which is sensitive to light, and it is in this state that it should be exposed in the camera.

Such is a general statement of the process: we will now enter somewhat into detail.

FIG. 30.



The collodion should be contained in a bottle with a wide mouth (*fig.* 30), which mouth should always be carefully cleaned before pouring the contents on the glass.

The box containing the cleaned glasses being placed in the dark chamber, a plate is withdrawn, and the dust removed from the polished side by means of a large badger-hair brush; then holding the plate by one corner (*fig.* 31) in the right hand, the collodion is poured upon it from the left hand, commencing at the corner B. It is then allowed to flow by inclining the plate from left to right, and finally draining back into a separate bottle from the corner D. If, at this moment, the plate is examined in a particular light it will be seen that it is covered with an infinity of small ridges in the direction B D (*fig.* 32.); but on inclining the plate rapidly from left to right these ridges will disappear. As soon as this happens the plate should be immersed in the nitrate of silver bath; but it is necessary always to wait a few seconds (and how many experience alone can indicate precisely) before the film is sufficiently set for immersion in the nitrate of silver bath. We would say, for the guidance of the reader, that there are certain characteristics by which it may be determined if the right moment has arrived. We will enumerate them:—

FIG. 31.
COATING THE PLATE.

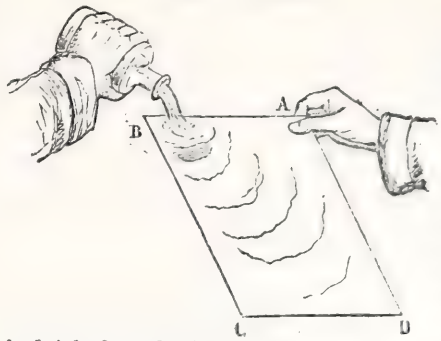


FIG. 32.
RECEIVING THE COLLODION INTO A SEPARATE BOTTLE.



1. If the plate be immersed in the bath while the film is still moist, it (the film) will become detached in fragments; and, in this case, it will become necessary to filter the bath.

2. If the immersion take place at the right time the film whitens gradually.

3. If, on the other hand, the film be allowed to become too dry before immersion, it whitens instantly, and a good proof is never obtainable under these circumstances.

Up to a certain point it is not difficult to determine when the plate should be immersed in the nitrate of silver bath. It will be found if the plate be looked at in a certain light that it has assumed a dull unpolished appearance. This, which is the right moment, will be arrived at in summer probably in about twenty seconds, while in winter it will probably take sixty seconds.

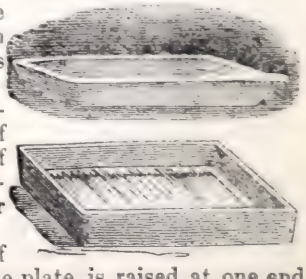
FIG. 33.
APPARATUS FOR FILTERING NITRATE OF SILVER BATH.



Nitrate of silver bath is very easy to prepare,* and the consideration of it shall not detain us long. It is quite as well for those whose operations are conducted on a somewhat extended scale, to have a considerable quantity of bath solution, and keep it in a large bottle to which is adapted a funnel and filter (*fig.* 33). The same filter will last a long time; and, on leaving work, the nitrate of silver bath which has been used during the day is poured into the filter, and in this way a solution in proper condition is always maintained at hand.

For the nitrate of silver bath, dishes in gutta-percha, porcelain, or wood with glass bottoms, are used (*figs.* 34, 35, and 38). Gutta-percha dishe are, perhaps, most frequently employed. As vertical baths in glass and gutta-percha are not much used, we shall say only a few words in reference to them.

FIG. 34 AND FIG. 35.
DISHES IN PORCELAIN AND WOOD, WITH GLASS BOTTOM.



The reason why we recommend a gutta-percha dish in preference to one in porcelain is, that the film itself can be better seen, as also the impurities which float in the solution.

There are several methods of immersing the plates in the nitrate of silver bath; and as this is one of the most important points in the present chapter, we will pause to consider it somewhat in detail.

The dish containing the nitrate of silver bath being much larger than the plate, is raised at one end (*fig.* 39) in order that the solution shall accumulate at the opposite

* See Nicol's formula in The British Journal Almanac for this year.

† From *Traité Populaire de Photographie.*

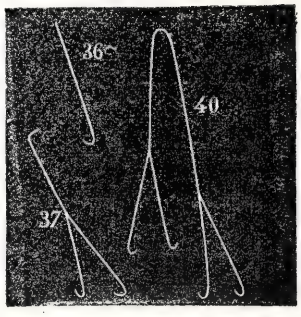
* In Note G we give details for the preparation of nitrate of silver bath.

FIG. 38.
GUTTA-PERCHA DISH.



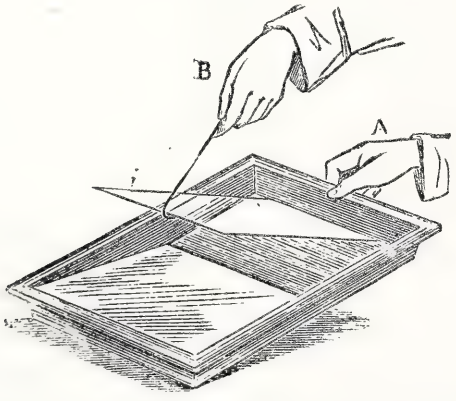
end; the plate, previously coated with collodion, is placed against the other edge, and held there by means of the finger or a silver wire hook; lowering then the plate by a continuous motion, and allowing the dish at the same time to assume the horizontal position, the liquid flows at once, and without stopping, over the whole of the plate. After this the dish should be raised and lowered during a minute or so; then introducing underneath the plate a hook made of flattened silver wire (*fig.* 36), and by its means withdrawing the plate from the bath, it will be seen to be covered by a number of veins which show that the nitrate of silver bath has not thoroughly penetrated the film, and that, therefore, the plate should be raised and lowered alternately until the silver solution flows evenly and smoothly over the whole surface of the film.

FIG. 36. FIG. 37. AND FIG. 40.
DIPPERS.



It is at this point that the plate should be withdrawn, the fingers being covered with India-rubber finger-stalls, in the absence of which box-wood forceps or an American clip should be used, as the nitrate of silver blackens the hands very strongly (Note 7). The plate is allowed to drain from the excess of adherent nitrate of silver solution, and is then placed in the camera frame. We shall treat of what follows in its proper time and place.

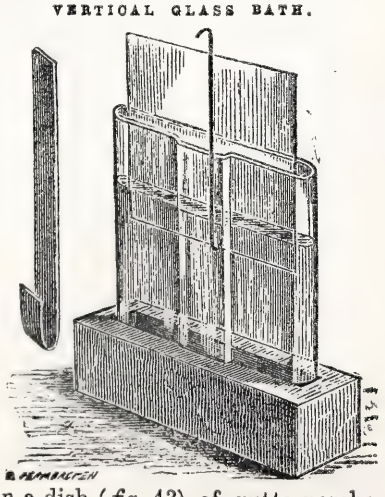
FIG. 39.



This method of operating requires only a small quantity of nitrate of silver bath solution, which is accordingly exhausted in a proportionately shorter time. The plan we are about to describe requires, on the contrary, a large bulk of solution, which has the advantage of becoming very slowly exhausted. Moreover, a vessel may be used which is only just large enough to allow the plate to be immersed and withdrawn with freedom.

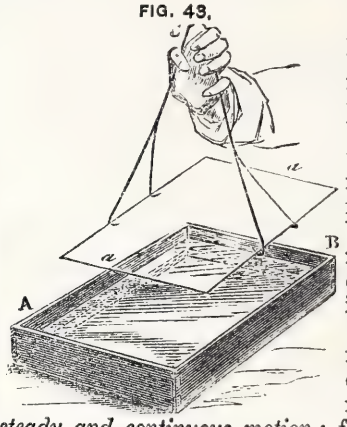
The solution is contained in a vertical bath, either of glass or gutta-percha (*fig.* 41); and, by means of a hook or dipper of gutta-percha, which is introduced on the lower side of the vessel, the plate is immersed by one continuous motion into the fluid, raising and lowering it alternately as before. The plate is finally withdrawn ready for exposure, when the ridges or lines thereon have disappeared.

FIG. 41 AND FIG. 42.
VERTICAL GLASS BATH.



This plan is not now generally in use, and the following will be found a better one:—Two silver hooks are first procured, made of flat sheet silver and bifurcate, of the shape shown in *fig.* 37. The nitrate of silver bath being contained in a dish (*fig.* 43) of gutta-percha, the plate is held between the two hooks, the film being uppermost, and plunged at one stroke beneath the liquid, taking care at the same time that one end is immersed before the other, for unless this be done the liquid will spirt out of the dish. The plate being once fairly covered by the solution, one of the hooks is removed; and with the other the plate is raised and lowered, in order to get rid of the veins or greasiness of which we have spoken above.

FIG. 43.



Instead of two hooks, it may be found more advantageous to use the two combined in one, as shown in *fig.* 43. We may observe, in passing, that the silver hooks may be replaced by others made of whale-bone. In order to bend these, it is necessary to hold them in the flame of a spirit-lamp until they bend, and to allow them to cool, maintaining pressure in the proper curve by means of the fingers, until it is quite cold.

Whichever method is followed in immersing the plate in the nitrate of silver bath, it is indispensably necessary that it be the result of *one steady and continuous motion;* for if this be not the case lines will be formed upon the film, which will become apparent very soon in irreparable stains.

To preserve the hands from the action of the nitrate of silver, some amateurs furnish themselves with India-rubber finger-stalls, or with gloves of the same material; but such appliances will be found very inconvenient; and those who wish to be successful in photography should make up their minds, before going into it, to sacrifice the delicacy of their hands and the whiteness of their shirt-cuffs.

We presume it is hardly necessary to observe that, at the time of sensitising the plate, the room should be made quite dark—an operation easily accomplished by moving the shutter in front of the yellow glass until the light is almost entirely excluded. With a little practice it will be found comparatively easy to work in absolute darkness.

As soon as the plate is placed in the camera-back (we shall return to this point), the window and door may be opened, and the bath covered with a plate of glass, in order to preserve it from dust.

Bits of Chat.

A CHAT ABOUT GLASS HOUSES.

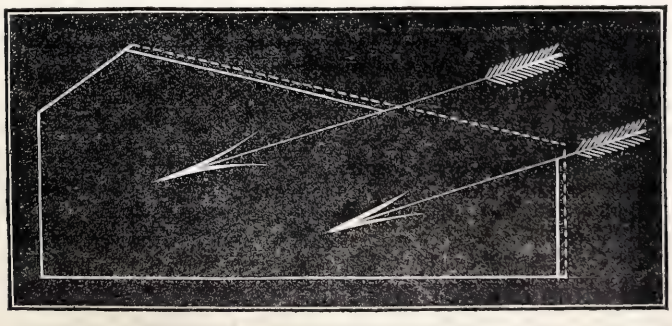
How very apt we all are to attribute to some one cause effects really due to the combined action of many causes! Like that popular old sage who confidently announced the building of a church steeple as the cause from which sprang the Goodwin Sands, we are never at a loss with our reason why. Tell us of a great crime, and few of us will fail to name *the* cause thereof. Tell us that Mr. So-and-so has failed in business, and we at once lay our finger on *the* rock he split upon, and are "not at all surprised." Tell us that Jack or Joe cannot succeed in life despite their most earnest and untiring efforts, and we wise folk shake the solemn head and sagely lament the *one* peculiar weakness or error to which Jack or Joe owe all their numerous and heart-sickening failures. For everything on earth we must have some *one* cause. So it is in photography. You have a certain amount of failure which puzzles and bewilders you. Recalling the various stages of your process and carefully retracing all the steps by which you arrived at certain unsatisfactory results, you feel lost in the attempt to account for the same. You pass in review your glass cleaning, your collodion, your silver bath, your treatment of the plate previous to exposure, the camera, the lens, the developer, the developing, &c., &c.; but none of these aid you in solving the enigma. At last you appeal to your photographic friends. Are they equally at a loss? Not a bit of it. Smith says at once, with a condescending smile of superior wisdom, "Of course, my dear fellow, it is all due to the condition of your bath: it is too weak." Jones unhesitatingly affirms that you should "add a little silver to the bath." Brown says briefly, "Your developer's too strong;" and Robinson says, with no more waste of time or thought, "Strengthen the developer!"

At length you discover, after long and painful experience, and many wearisome but futile efforts, that you are successful. *Everything has been modified.* The bath has been strengthened or

weakened to suit your light; your collodion has been modified to suit your bath; the developer has been altered to suit both; and work becomes a pleasure instead of a plague. You can then turn your thoughts to the art's more purely artistic aims, and you become a miracle of success to all who are passing through the same troubles and discouragements from which you have so happily emerged.

Then there comes to you "one more unfortunate," and he envies your success, and makes a very earnest, touching, melancholy appeal to your Christian charity; reaping the fruit of which, he writes down full particulars of your process, and carries away all your formulæ in a book. But, strange to relate, he does not succeed in any greater degree than he did before doing all this. So he calls on you again, and, striving to appear as unsuspicious, confiding, and ready of belief as he was at first, cross-questions you in an indirect way, which says as plainly as possible—"I don't think you told me the truth, or at any rate the whole truth, or how is it that I, working exactly as you tell me you work, and using precisely the same means, cannot arrive at the same results?" The simple fact is, your disciple has overlooked one important consideration—say his glass-room and your glass-room are two different things; and while you have been modifying and harmonising, dovetailing and uniting, as it were, one part with another, until the more or less perfect whole has been secured, he, on the contrary, has been working with antagonistic elements. Nor is this case at all an uncommon one; for, as a rule, we overlook the important part light plays in regulating the quality or character of our productions. We continually witness the generosity with which our successful brethren contribute to some photographic friend, acquaintance, society, or journal what they evidently consider as a full, true, and particular account of all their doings photographic; but we very seldom find them describing the peculiar quality, quantity, or arrangement of light, which is to their process what the character of *Hamlet* is to the tragedy of "Hamlet." And this brings us to the threshold of our present bit of chat, which is to be about glass-houses.

First, with regard to the aspect of a glass-house.—Well, we are pretty well agreed that for steadiness and uniformity a good, even sky-diffused north light is *best*, although most of us have seen first-class pictures produced in houses having all sorts of aspects, and perhaps have heard the proprietors thereof argue each one in favour of his own. We are not quite so well agreed as to the south being the *worst* aspect, although it is generally described as the worst. I have heard more than one good operator assert, on the contrary, that when well managed it is the very best, giving more detail and transparency in the shadows of a negative, and enabling them to take pictures of good average quality, when those working with the north aspect could not secure anything at all passable. One of the most successful amateur portraitists I know—Mr. N. E. Fitch—works entirely with a south light; and I remember reading in one of the American journals of a gentleman who, by using moveable screens of pale blue paper, sloped at an angle which cut off the direct rays and only allowed the reflected rays to reach the sitter, overcame the strong glare of a southern aspect, and converted a room which he had just despaired of making at all serviceable into a very famous one, in which he could secure light enough for work, by simply removing the screens, in the dullest weather, and by replacing the screens could work with as much ease on the very brightest day. The method of overcoming the difficulties of this aspect are not quite met by this or any other plan, however, for the changes in the quality and quantity of direct light must be far greater and more frequent than they could possibly be in working with the diffused light of the northern sky. Mr. Fitch meets these same difficulties in a somewhat different way. To explain this we shall need a diagram:—



The dotted line gives the place of the glass. The second line under the dotted line indicates that portion of the glass which is ground or stippled to diffuse and weaken the light before it reaches the sitter; and the long arrows show the line which the more purely direct light traverses in its passage to the sitter. To complete this description, I must add that the loftiest portion of the room is twelve feet and the lowest seven feet from the floor, and that its length is twenty-two feet. You will see by this that a very large quantity of such subordinate light as finds its way through the ground or stippled glass is present in the room, and reaches the sitter from the top and front, and that the entire absence of side light is more than compensated for by the long angle at which the direct or principal light is made to travel to the sitter. The glass-room used by Mr. T. R. Williams, again, is devoid of side light, and is, in other respects, very similar to that of Mr. Fitch. There is also no small amount of similarity between the productions of these two very clever photographers, which is a somewhat significant fact in reference to our present subject.

The front light, although such a belief is by no means popular, I have always held to be a very valuable addition to the glass-room, serving as it does to secure roundness and to penetrate and give detail to all, even the very deepest, shadows. When associated with side light of course this front light must be a *subordinate light*, weakened either by its distance from the sitter, or by being modified with ground, or dark blue, or stippled glass, as it is to some extent even in Mr. Fitch's house; but its importance is undoubtedly great. This is now becoming generally recognised. Mr. Window, a very clever and thoughtful photographer, has recently built a house in Baker Street having this front light. Mr. Fry's recently-built house in the city has it; and I could name many other good authorities who, in building or altering their glass-rooms, have taken care to secure a properly modified amount of front light.

Mr. Fitch, speaking of his arrangement of light, said, at the meeting of the South London Photographic Society:—Although the aspect of my room is certainly not the best, on account of the sun, I am almost of opinion that it produces greater roundness of feature than any other, and should certainly choose the same aspect in building another." I think Mr. Fitch was very right in asserting that his arrangement of a glass-room gave "greater roundness of feature" than any other; but I think he was decidedly wrong in supposing this to be due to the aspect of his room, and think it may be more safely traced to the absence of side light, which, with so large an amount of diffused sunlight from the top and front, would be altogether a mistake. It may be remembered, perhaps, that in my now concluded *Letters to a Young Photographer* I pointed out that shade gave a retiring effect, and light an advancing effect. This cannot be denied. Now, by the method of lighting adopted by Mr. Fitch, all the shadows must necessarily fall upon the retiring surfaces, and all the light upon the advancing or more prominent features—a fact in itself sufficient to account for the great roundness and relief displayed in all this gentleman's very excellent productions, without seeking for a reason in the peculiar aspect of his glass-room.

The objections usually urged against a front light are, to use the words of a contemporary, that "it has a tendency to give a flat, broad effect to the features, and make the eyes light, fishy, and expressionless." If the direct front light enters at a level with the face, and is not properly subordinated to the loftier light, this is undoubtedly a true statement of the case; but we must not entirely ignore a very valuable application, simply because thoughtless people have misapplied it. A front light falling at a long angle upon the face gives roundness, relief, and force of effect, even when, owing to the large amount of diffused light made use of, the shadows are so delicate and soft as to make one suspect that a weak, flat, feeble image must be their necessary result. You may get the strongest of black shadows, and most vigorous and well-marked gradations of tone, without obtaining anything like the same amount of relief and modelling to be found in the productions of Messrs. Williams and Fitch,* in which (to speak in a general way) the deepest shades are the merest touches of what is scarcely black, and the great mass of shadow is tenderly delicate and soft in all its numerous and insensibly-blended gradations.

Another argument, once urged by a friend of mine against the use of a front light, was, that artists invariably painted portraits with a side-light, and that both sides of the face would receive from the front light equal portions of light and shadow. This was not a very deep argument, because the artist's side-light

* I mention the names of these gentlemen because I am most familiar with their productions, and not necessarily because there are no other professional and amateur productions thus characterised.—A. H. W.

always enters in front of a sitter, and above the level of the sitter's head, and is, therefore, a top light. The amount of light, moreover, will always be weakest upon the side of a face which, in a three-quarter view, is farthest from its source; while in the case of a full face, in which both of its sides are equally distant, there is certainly nothing less picturesque in the two sides being equally illuminated than there is in an equal division of light and dark in a very common "half-and-half" way. As an illustration of a really side-light acting practically as a top light I may, in passing, just state that in the glass-house of Mr. Goodman, well known for his beautiful artistic studies and subject groups, there was no glass in the roof at all. But the room was so lofty that the light from the side fell upon the model at an angle which at once converted it into a top light.*

As I am the first, I believe, to argue in favour of a front light in the pages of a photographic journal, it is very possible that I have overlooked arguments which some of my readers may be prepared to urge in opposition thereto. If so, let us ventilate our reasons in the correspondent's pages. A little friendly controversy, carried on as warmly as need be, but with a kindly view of the common ends and aims which should influence its spirit, will not, I am sure, be objected to either by the Editor or readers of THE BRITISH JOURNAL OF PHOTOGRAPHY.

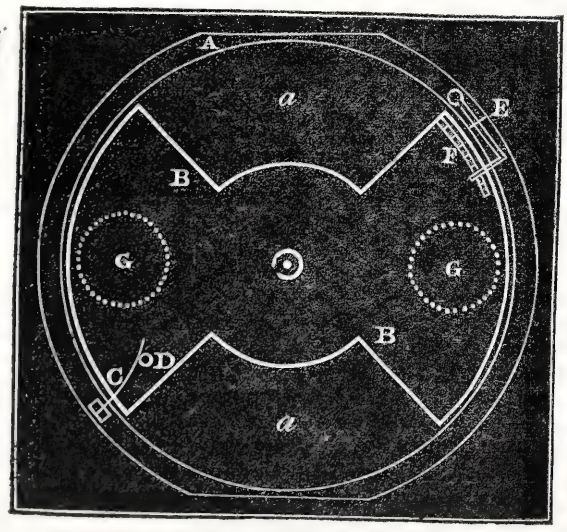
I have much more to chat about in connexion with this subject, which is a most important one by-the-bye, but must defer what I have to say until "our next." A. H. WALL.

INSTANTANEOUS SHUTTER.

By H. PETSCHLER.

THE annexed rough sketch illustrates a very simple and most efficient shutter, which I lately introduced to the notice of the Manchester Photographic Society.

It consists of a turned wooden disc, about three quarters of an inch thick, and six inches diameter, hollowed out in the centre *a*, about a quarter of an inch deep, forming a rim A.



In the centre of the hollow a brass disc is made to revolve, two quarters of which are cut out at opposite sides: this forms the shutter B. C is a spring fixed to the outer wood rim. D is a pin fixed to the revolving shutter. E is a spring catch, fitting into a rack F. G G are two holes in the wood disc, cut to fit on two stereoscopic lenses. It may thus be adapted to any lenses already fixed to the camera.

The diagram illustrates the shutter as being set, the two segments of the revolving disc at B B covering the openings of the lenses G G. The rim A excludes the light from between the shutter and the wood disc, both of which are painted black. When watching for an opportunity to expose keep your finger on the knob at E. A slight pressure will release the rack F from the catch, and the spring C, pressing the pin D, will spin the shutter round, and lock itself again on the opposite side on the spring. The exposure may be accelerated or diminished by straining the spring more or less, the catch being set more forward or backward in the rack. If a longer exposure be desired than the spring will allow, the hand is made use of to turn the shutter.

* I believe a top light so obtained to be preferable to light got from a glass roof, not entering a long angle, as in Mr. Fitch's room.—A. H. W.

The advantages which I claim for this shutter are—that it can cause no shaking during exposure, as it revolves on its centre; that it gives equal exposure over the whole opening; its simplicity and easy working; its easy application to any lenses or camera; and, *when no mounts for lenses are used, the opening may serve as the stop.*

[Mr. Petschler is evidently unaware that this is identical in principle and almost identical in form with Mr. Shadbolt's arrangement, exhibited at the London Photographic Society, 3rd April, 1860.—See Society's Journal, vol. VI., page 193; this Journal, vol. VII., page 115, and vol. VIII., page 128.—ED.]

PHOTO-MICROGRAPHS.

Executed by Dr. R. L. MADDOX.

WE mentioned casually in our last issue the receipt of some admirably-executed specimens of photographs of microscopic objects produced by Dr. Maddox; but want of space precluded our giving at the time any extended description of them.

The discovery of living animals in the nitrate of silver bath was an event of at least as much interest to students of natural history as to photographers, and readers of both classes, no doubt, made a note of the paper which appeared in our number for May 15, page 189, of the current volume, descriptive of the surrounding phenomena. We endeavoured to give our readers an idea of the interesting strangers then introduced to their notice by means of an excellent wood engraving, very carefully cut after one of Dr. Maddox's photographs; but though when properly printed the engraving was an exceedingly accurate representation of the original, the exigencies of a steam printing-press precluded the possibility of handling so delicate a cut with the care needful to reproduce all its details. Those, therefore, of our readers who are naturalists will be pleased to learn that it is in contemplation to have them re-engraved in a style more suited to such delicate subjects; but, should any insuperable difficulties present themselves, the photographs will be published, which will be more valuable to those unaccustomed to the use of the microscope than even the objects themselves—for they are not mere *silhouettes* of the originals, but abounding in the most delicate detail, as well as being clear and sharp in outline. There is a regular series of illustrations, consisting of male, female, and young, together with some of the special organs, such as those of prehension—some subjects being executed under different degrees of magnifying power, by which a clearer idea of their nature is conveyed; and, as standards of comparison, two other species of *Acari*, viz., that of the cheese mite, and that singular one known as the acarus of the *Abielle perce-bois*, are included in the series.

In addition to the preceding there are some few illustrations of the siliceous fossil remains of the *Polycystina* from Barbadoes, together with several *diatomaceous* forms which accompany them. These are executed in a style that gives a far better idea of the brilliant originals than any photographic representations that we have hitherto seen, and some specimens (proofs upon albumenised paper) bear with advantage a considerable magnifying power, even to the extent of twenty diameters, under which further details imperceptible to the unassisted eye become revealed—a fact which affords indisputable testimony to the very unusual excellence of the negatives. We would not be misunderstood as asserting that details are shown such as we have described exceeding what can be discovered by the eye alone in the microscope, but further than can be detected without the aid of a lens either in the negative or positive impression therefrom.

We have some excellent representations of *Diatoms* from other sources also. Several frustules of the *Triceratium favus* (very characteristically rendered); front views of the *Surirella bifrons*, from Lough Mourne; the *Terpsinöe musica*, from Mexico, under two kinds of illumination; and three specimens of *Coscinodiscus*, from Melville Bay. These are all taken with a one-fifth-of-an-inch objective by Smith, Beck, and Beck.

Of objects of other classes there are some very promising specimens, though one or two have presented difficulties not yet thoroughly overcome; for instance, there is a *Zygnema (spirogyra)* which presents no real indication of its cylindrical nature, though sufficiently recognisable by any one acquainted with the object. The pith of the stem of the *Hydrangea* is a little confused in appearance owing to the appreciable thickness of the section (transverse), but the nearer surface is very sharp and distinct. The red colour of two specimens of marine *algæ* has interfered materially, together with the thickness of the object itself, to prevent the successful photographic representation of one of them,

though we believe it to be a *Polysiphonia;* the other, apparently a *Corallina*, is, however, well defined, in spite of the difficulty mentioned.

We are much pleased that so able a manipulator as Dr. Maddox has turned his attention to a branch of our art affording so wide a field for the exercise of acuteness and skill as the delineation of microscopic objects, and we may add, also, which promises so fair a prospect of remuneration to the successful operator. We may mention, before closing this notice, that already this same gentleman has produced for the stereoscope photographic representations of an object as seen in the binocular microscope—that latest improvement by Mr. Wenham of physiologists' most important instrument of research.

In conclusion, we may observe that the specimens above described are to be obtained of Mr. Baker, High Holborn, London, and of several other optical and philosophical instrument makers, with the exception of the *Acari:* these are at present not ready for distribution, but we may shortly be able to state when they will be ready.

PHOTOGRAPHIC THEORY APPLIED TO RESEARCHES RELATIVE TO ACCELERATORS.*

By Eugene Sahler.

The following are the principal results arising from experiments that I have made conformably with the theoretical hypothesis which I advanced in my last communication.

Reducing agents can be employed as accelerating substances, but they have a tendency, more or less energetic, to fog the proofs in consequence of a reducing action which operates even before exposure.

Phosphite of potash employed in the collodion affords only good results, the phosphoric acid which is set free combines with the oxide of silver produced by the reduction of the nitrate, and prevents the fogging: the time of exposure is reduced one-half by its use. Hypophosphite of soda has afforded me similar results; but, as all the hypophosphites are soluble, it is needful to employ it in a different manner.

The best accelerating substances are the oxidating ones; chlorate of potash, in presence of free nitric acid, gives instantaneous proofs, with clouds perfectly rendered. This salt may be used in the collodion, and even in the silver bath, which, when pure, it does not even make turbid. The proportionate rapidity is as follows:—

On a dull, rainy day, collodion sensitised with iodide and bromide of cadmium gave a good negative in twelve seconds.

The same collodion with nitrite of potash required an exposure of only seven seconds, and with chlorate of potash from four to five seconds.

I expected good results from the chlorites, but I sought in vain to obtain them: their use entails the necessity of certain precautions, especially with the ammoniacal compounds.

M. Berland, a photographer at Montbéliard, has been so obliging as to repeat all my experiments, and with a perfect agreement as to the results attained. I should add that I operate with a neutral silver bath and a collodion containing an excess of iodine. I prefer this arrangement because the chemical affinity of iodine for silver opposes a very slight impediment to the decomposition of the nitrate by light when the plate is left a sufficiently long time in the silver bath.

International Exhibition.

THE PHOTOGRAPHIC APPARATUS AND APPLIANCES.

By Samuel Highley, F.G.S., F.C.S., &c.

All who may be impressed with a vivid reminiscence of the fairy structure of 1851, on making their first entry into the present Exhibition Building must be stricken with a feeling of heart-sickness and disappointment, similar to that experienced by emigrants from lands abounding with tree-covered hills and luxuriant plains who find themselves landed in a country monotonous in unfoliaged levels, where there will be nothing of the poetry of nature in the surrounding of their new Home to refresh the soul during the hours of toil, or after the labours of the day are done.

Who can ever forget Paxton's crystal hive, suggesting a design begotten in a dream of fairyland—a Palace framed of spiders' web, with the interlacings filled with entangled films of dew—or its endless vista, dotted with many a trophy and triumph of Science, Art, and Manufactures, extending apparently to infinity, typical of the endless labours of man and of ground yet to be conquered! Who can have traversed that building without bearing away an undying recollection of certain objects, such as *The Amazon*, *The Mourners*, *The Stuttgardt Horses*, *The Greek Slave*, or the glorious roll of the organs! Can the same be said of the present Exhibition? I think not! For, whether viewed from the inside or from the out, it is unsatisfactory from its want of grandeur, even though the interior be wonderfully modified since the day of opening, when the nave was an utter chaos of pinnacled and domed cases, grouped without any reference to symmetry, and without a single line of avenue wherewith to guide the eye to the extent of the building. It is not that noble groups of statuary are wanting on this occasion; but the space and the flood of light that contributed so much to do such objects justice is not provided for in the present structure—in 1851 such groups as we have indicated were isolated, therefore arrested attention; now, nearly every piece of sculpture is hemmed in with incongruous objects—nor are the arrangements such as to allow of the larger musical instruments producing such grand and impressive effects as in the magnificent nave of the Hyde-park edifice.

Those whose duty or pleasure it may be to compare the products of one country with those of another will soon feel convinced that the Royal Commissioners have succeeded in establishing under their rule the perfection of higgledy-piggledy, if they have failed in many other of their duties. Let any one attempt to discover the *locale* of the photographs, the chemical products, or the philosophical instruments scattered over the building in many a nook and corner, and they will find the search more difficult than that after Gammer Gurton's needle, and the labour as eternal as that of Sisyphus.

It is to be hoped that the difficulties in the way of making comparisons having been "found," will, according to Captain Cuttle's rule, "be made a note on," and that at all future Exhibitions it be insisted that objects of the same nature, to whatever country they belong, shall be classed together; for we hold that *facilities* for comparison ought to be one of the principal features of the arrangements of any such gathering together of objects as that now in existence; and we believe that such an arrangement *could* be planned that all objects of A class could be grouped together, without separating individual contributions from the country to which it belonged—in fact such an arrangement that, *at will*, the collective contributions of a country could be examined, or a class of objects contributed by many countries compared, and thus the prejudices of our Continental neighbours could be reconciled with the predominant wishes of our own countrymen.

The first portion of the building that claims the attention of the photographic visitor is that devoted to Class II., wherein will be found the following exhibitors, whose cases (as a rule) contain fine samples of the chemicals used in photography; such as recrystallised iodine, recrystallised nitrate of silver, cyanide of potassium—commercial, pure, and crystallised—gallic and pyrogallic acids, tannin, hyposulphite of soda, the iodides and bromides of potassium, cadmium, &c. These are exhibited by Messrs. Bailey, Cox and Gould, Dunn and Heathfield, Hopkin and Williams, Huskisson, Morson and Son, and Squire and Co., and will be found in a group at the top of the incline in the Eastern Annexe, where the path diverges to the Agricultural Implements on the left, and the Substances Used for Food on the right hand.

Fine samples of the Chemicals Used in Photography will also be found in the cases of Messrs. Bland and Co., Cox, Hopkin and Williams, Horne and Thornthwaite, and Rouch, in Class XIV. in the scientific cockloft, and also in many parts of the building in the collections of foreign countries; but a notice *en passant* is all that is necessary of this section of the Photographic Department, as little can be gained from a mere inspection of such specimens beyond what an experienced eye can gather as to their value, and their history has already been given in these pages in the valuable articles of Mr. Martin.

To assist our studies of Class II. we naturally turned to the pages of the Official *Descriptive* Illustrated Catalogue of that department, or, rather, what we expected to find the Official *Descriptive* Catalogue, bearing in mind the valuable production of 1851. We were again doomed to disappointment; for, upon turning over page after page of this official abortion, we found that its more fitting title would have been "The Royal Commissioners' Exhibition Advertiser," for as neither matter nor illustration were admitted *without being handsomely paid for* by exhibitors desiring a description of their goods, the result may be anticipated

* From *La Revue Photographique.*

by any person possessed of common sense who will give five minutes' thought to the matter.*

If it be desirable to produce an official description of the articles contributed to an International Exhibition — and, for obvious reasons, there is no question but that such a Catalogue *ought* to form part of the programme of every such Exhibition—making a proviso that the exhibitors themselves must pay the cost of its production is a very certain way of attaining that official goal,—"How not to do it!" How is it possible to secure, under such circumstances, the co-operation of a mixed class of men of many nations, who are exhibitors for *varied* motives? The majority, either from want of means or will, could not, or would not (as the result proves), send in descriptions of their goods, if it be a *sine quâ non* that they must pay at the rate of five guineas a page for insertion!

For the Catalogue of 1851 every exhibitor was requested to send in a description of his goods, subject to the supervision and curtailment of competent editors, *but free of charge* (except in the case of illustrations). The result was a work that is full of matter, and that will be valuable to all time. The production of 1862 is little more than a reprint, in large type, on fine paper, of the shilling Catalogue. The descriptions of articles are generally imbued with the advertising element, and contrast very unfavourably with the style of matter in the Catalogue of 1851.

Even if we turn to the illustrations they are, in many instances, discreditable to the work, which, emanating under the auspices of a Royal Commission, might fairly be expected to attain to the highest standard of excellence. At page 40 we have a ridiculous cut of a blacking-brush and blacking-bottle, wielded by a pair of swarthy arms; at page 45 a charming group of "flaming fusee" boxes, supported on one side by a gentleman lighting his cigar with a fusee, and on the other by a man at the helm lighting his pipe with the same—a very fitting cut for the back page of *Bell's Life*, or even the advertisement pages *proper* of the Illustrated Catalogue, for it will be seen that the work is divided into advertising pages proper, and *improper*. At pages 64, 71, and 79, we are favoured with artistic and unartistic designs of sauce and soda-water bottles—one group occupying the best part of a page. At page 99 there is a perfect eruption of brushes, "scrubbing," "deck clamp," "horse water," "horse body," down to "Scotch scrub," which last we take to be an invention of the celebrated and philanthropic Duke of Argyle of *posting* renown. At page 112 there is a fancy portrait of a Civet Cat that will enchant Dr. Edward Gray, of the British Museum, who is a Juror in the Educational Class, and who will doubtless be impressed with the progress of ideas on popular Zoology since 1851. At pages 97 and 101 much space is given (or rather paid for) to two large cuts of the Council Medal of 1851, the connexion of which with the Descriptive Catalogue of 1862, however, not being quite apparent. And, lastly, the best part of a page is given to a representation of the top of a tooth powder pot, and "such small deer." We feel quite assured that if this (which should be an important record of a great gathering of the inventions of nations) had been confided to the care of such houses as Longmans' or Murray's, either would at once have excised half the matter and most of the illustrations that have been "approved"† by a Royal Commission, in its feverish desire that something "should pay."

Exhibition Gossip.

THE BRITISH LANDSCAPE PHOTOGRAPHERS.

And now we are in the presence of an army of conquerors. Breese, Bedford, Wilson, Blanchard, England, Mudd, Robinson, Frith, and a crowd of other landscape artists stand foremost among the photographic victors—greater in number, higher in rank, than the landscape photographers of any other country. We have some glorious landscapes in the French Department; but how few they seem in proportion to the number of exhibitors when we look around our own department! Crowded together in their small lofty space—huddled up with all sorts of incongruous objects in the narrow passages between the screens—they yet attract the eye and enchain the attention.

Look at the visitors crowding eagerly to get their turn at the stereoscopes which contain those wondrously beautiful pictures taken by Mr. Breese, and listen to their exclamations of pleasure and delight.

Hear the heavy sigh of enjoyment with which that enchanted, sentimental-looking youth contemplates Wilson's rolling masses of sun-illumined vapour, and traces the golden path which, seeming to flicker and sparkle as he looks, carries his eager eyes over the vast plain of restlessly-heaving waters to the far-away horizon. Then listen to the loud, hearty laugh with which that "young man from the country" prefaces his honest, vulgar expressions of wonder, and anxiously inquires after "our Jane," that she, too, may share the delightful sight which has transported him with more than magic speed to a familiar scene "at whoam," and tickled him through pleasure into laughter, because it is "so loike." In the one case poetry asserts its influence, in the other fidelity of resemblance —in both we see how universal our art is in its varied and powerful appeals. There is an artist enraptured with Blanchard's exquisite bits of picturesque sky and water; there an architect pondering thoughtfully before Bedford's architectural productions; here a geologist carefully scrutinising the pictured rocks of some wildly-romantic scene, by Mudd, perhaps; and yonder an antiquary absorbed in thoughts called up by some lone relic-ruins of an earlier age.

On a crowded day at the Exhibition, and in the course of a very short visit to the Photographic Department, all these and many other classes of deeply-interested visitors may be seen, and a lesson read which may do those who have thought lightly and spoken contemptuously of photography's mission and value no small good.

Mr. W. W. Rouch exhibits some very charming little pictures, which are full of space, aërial delicacy, light, tone, and clearness. They are sharp without being hard, forcible without having staring contrasts, brilliant without lacking repose and harmony. Some, however, are under-exposed, and some have glaring white skies, which is a great pity.

Some capital large Talbotype pictures are exhibited by Brecknell Turner. They lack transparency and detail in the shadows, and are somewhat chalky in the lights; indeed, some are very chalky. Good, bad, and indifferent specimens are exhibited by Colonel Shakespeare. Some curious smears and streaks which mysteriously deform some tolerably good landscapes by the Hon. W. Vernon I suppose were intended for clouds. Mr. Branfill exhibits some very good pictures, one of which—a view of a rustic road winding between trees—from a tannin plate, is a gem of a picture. Some of this gentleman's pictures are rather under-exposed. Ebbage's photographs are hard and ugly. R. Gordon shows some beautiful specimens. Cade, of Ipswich, has some tolerably good photographs, which are, however, deficient in transparency and detail in the shadows. S. Thompson has some excellent pictures. Sidebotham contributes some exquisitely delicate, soft, and harmonious pictures. Artistically beautiful pictures are exhibited by Campbell, of Ayr, but most of these also exhibit effects due to under-exposure. Mudd eloquently asserts in his works the beauty and power of his art. An interesting view of Chichester Cathedral after the fall of the spire comes from J. Russell. Sir A. Macdonald contributes many specimens, good, commonplace, and very good: in several the great fault lies in a striking want of transparency in the shadows, and a general want of contrast and relief. Mr. Brownrigg, of Dublin, exhibits some pictures which, with one or two exceptions, are decidedly commonplace. The London Stereoscopic Company's contributions vary in quality, from the magnificent stereographs of Mr. England to others which range from very good to very queer indeed. Dixon Piper's pictures are remarkably fine.

Vernon Heath's pictures are very varied in their degrees of merit. Some are as fine as artist could desire—full of beauties—and all display most excellent photography. In most of this gentleman's productions, however, there is a want of interest, an absence of pictorial focus, a monotony, which, although distinct from that caused by a lack of contrast or relief, is no less readily felt. In other words, they want *subordination*. Two excellent pictures, *The Cottage Porch* and *The Castle Gate*, only require this charm to complete them. Scattered lights of equal intensity, and chess-board patches of dark, would destroy the picturesque beauty of the otherwise finest work by the most skilful operator. Mr. Heath should take a lesson in this from the neighbouring photographs by Mr. Bedford, which almost invariably exhibit an artistic breadth and principal focus of effect. Good photography, with exceeding delicacy, clearness, and softness, characterise Mr. Heath's productions; but they are strangely unequal in an artistic direction.

* Some one experienced in publishing matters must have anticipated the failure of this advertising venture; for we find that the title of the production stands "Official Illustrated Catalogue," and not, as in 1851, "Official Descriptive and Illustrated Catalogue." Are the Commissioners indebted to the *acumen* of Mr. Cundall for this loophole?

† "Exhibitors must provide their own woodcuts or engravings, which, if *approved* by the Commissioners, will be inserted." *Vide* Prospectus of Official Illustrated Catalogue.

H. White's, although sometimes rather stiff and formal from the choice of view, discovers excellent photography, and in many cases very high artistic merit.

Mr. W. D. Hemphill contributes a somewhat large number of excellent landscapes, which, unfortunately, are deformed by the frequent presence of that breadth and truth-destroying enormity, white "skies" (?). For choice of subject, light, and effect, most of this gentleman's pictures deserve the highest praise.

As so many of the landscapes here exhibited have already received notice in these and in contemporary pages, we shall here quit this branch of the art until our next number, when it may be resumed in connexion with the foreign departments.

A. H. W.

WHERE TO GO WITH THE CAMERA.

By Our Own Pioneer.

EXETER—THE TAW AND TORRIDGE.

Exeter—formerly known as Caer-Iske (the fish castle or city of the fish river, now called the Exe)—is in itself well worthy a photographic visit; and will, with the neighbourhood, fully maintain the claim to its generally acknowledged title of the "Queen of the West." As regards art, graphic and photographic, various professors in the city, and some in the districts round, will be found entitled to places in the first and foremost ranks. In the earliest days of the silver-plate process Exeter stood conspicuous. Beard, the original patentee of the Daguerreotype process in England, was at one time settled at Newton; while the right to "exercise the art" in the northern division of the county was secured by a printer and stationer at Barnstaple. Cousens, the unrivalled engraver of *Bolton Abbey in the Olden Time*, comes from the "Ever-faithful City." Danby, the gorgeous painter of sun-sets and historical subjects of the Martin school, lived for some years at Exmouth. Various other painters and engravers could be mentioned fully entitled to honourable distinction; while one artist in a peculiar branch—the scenic—and whose panoramic views of the Lakes of Killarney, at the Lyceum Theatre, in *Peep o' Day*, have attracted thousands, and are pronounced as unsurpassed in beauty by anything of the same kind ever produced, was at one time the scene painter of the Exeter Theatre.

That photography is well patronised in the west is evident from the number of operators in the city, and from one or more being located at each of the principal towns and in many of the smaller. There is a Photographic Society in Exeter, though not represented by any recognised organ. This is to be regretted, as many of the professional and amateur members are well up in chemistry and optics, and second to none in the practice and application of the art generally. The professional photographers stand out as most distinguished in portraiture, and produce first-rate specimens of enlargement by the solar camera, and highly finished subjects on ivory and paper in miniature. Landscape photography is not represented to the extent it might be, though the high quality of the numerous stereoscopic views of the district fully prove their capability; but then it does not pay like portraits—there is not the demand for it—and, as "those who live to please, must please to live," the professionals cannot be blamed for following up that branch of the art most remunerative and in accordance with the public taste. "Time works wonders," and the approaching year of sixty-three may do something of the same kind in regard to photographic landscape-art in the west.

The Bath and West of England Agricultural Society hold their next meeting in Exeter; and as this association is noted for the high standing they have attained, the encouragement they offer, and the prominence they give to their fine-art department, it is to be hoped the profession and the amateurs of Exeter and the neighbourhood will not neglect the opportunity they will have of distinguishing themselves. They have a wide field in antiquarian treasures, objects of interest, and places of note, that have fortunately escaped the destruction of time and the ravages of the fanatic. The fine-art arrangements of the Society are under the control of a committee of gentlemen long known as encouragers of art and possessors of private collections of much that is good and rare. I need only mention the Squire of the Grange, near Cullompton, the owner of Bradfield-hall, and the Baronet of Pynes, with many others of taste, courtesy, and discrimination, that will ensure artists and exhibitors from the annoyances and insults the great body of photographers have been subjected to at the hands—we cannot say heads—of the great "International Incapables." The Exeter Exhibition has every favourable point on its side:—time to select and prepare subjects—no hurrying for the last moment—and no dust, dirt, and—"such a getting-up stairs."

Exeter can be reached from the Waterloo-bridge Station in a few hours, and the following places noted down and looked at, and, if needed, taken:—First, the cathedral, as it now stands, dating from the time of Henry I., 1112. The foundation of the see is, by some historians, fixed at Bishops Tawton, near Barnstaple (where there are some remains of the old palace), removed thence to Crediton, and finally settled at Exeter.

The west point is a fine piece of stone-work—a sort of gallery of figures. It is much defaced by dirt and time, but makes a good picture. Permission should be requested to go into the grounds of the palace, close at hand. it was the head-quarters of royalty in the troubles of 1646, and the birth-place of the Princess Henrietta, afterwards Duchess of Orleans. The palace inside and out is interesting. The east end of the cathedral, from the grounds, appears to great advantage, taking in the chapter-house, &c., &c. In the hall and library are some fine bold specimens of carved work in chimney-pieces and enriched mouldings. In the palace, and those parts of the cathedral best seen from the gardens, and in the interior of the cathedral, there is much to interest the photographer—much that has fortunately escaped the Puritan visitors of the Reformation. A private etching was circulated some five-and-twenty years back in Durham, consisting of a centre view of its cathedral, with the churches of the city arranged round as a border. This idea might be worth the attention of some local professional, and made remunerative by bringing out a view of Exeter Cathedral (dedicated to St. Peter) with border views of All-Hallow's-in-the-Walls, St. Mary's Steps, St. James's, St. Martin's, St. Laurence's, St. Mary Arches, St. Mary Major, St. Olave's, St. Sidwell's, and the rest of the twenty-one parish churches of the "Ever-faithful City." The authorities were sadly at fault in allowing the bridewell and county-jail to occupy their present position, completely spoiling the otherwise fine picture that could be taken from Northernhay and the castle walls. For a general view of the city, embracing its best buildings and most peculiar characteristics, there is no place better than the field behind St. Thomas's Union. Visits could be paid to numerous places within a few miles and returning to and from, such as Sidmouth, Exmouth, Budleigh, Salterton, Honiton, or Crediton. The photographer who is bent on collecting interesting bits in connexion with ecclesiastical remains will find the College-hall, in South-street, used for the meetings of the Exeter Architectural Diocesan Society, worth a visit, as a large volume, the *Scrap-book of the Society*, contains a great variety of sketches and drawings of cathedrals, churches, chapels, abbeys, mansions, halls, castles, fonts, doorways, &c., &c.

On inquiring at the hair-dresser's shop, directly facing the College-hall, the person there will direct to the curator in Southern-hay, who will readily give permission for the drawings and books, &c., to be looked over. By this means collectors will be enabled to decide on the merits of various architectural subjects in the locality, and see at once if it is the sort of thing they may be desirous of photographing. A walk is also recommended into the Cowick-fields, either from the Alphington-road or the lane by the end of the Church of St. Thomas the Apostle. Go on for about half-a-mile, then turn and look in the direction of the city, when one of those fine medium line pictures will be met bringing forcibly to mind some of the sepia tinted effects of "Girtin and Sheppard." Returning to the foot of the bridge, and following the Okehampton-road for a short distance, there is the decorated Chapel of Exwick, close to the railway; while, further on, are Cowley-bridge and the view from the same—two effective summer subjects. One of the most interesting routes that can be taken will be one through Crediton and Copplestone into the far-famed Taw Vale.

Crediton can be reached by rail or road. If by the latter, Newton St. Cyrus will be met about four and a-half miles, where the church and village will be found to be well adapted for photographing, and will yield interesting pictures from several points of view. Then comes Crediton, on the river Creedy, with its old pointed church of the fifteenth century, fine west windows and door-way, with some good interior bits, not forgetting the remains of the old Bible chained to the reading desk. The place was of much consequence in the olden time, previous to the union of the sees of Devon and Cornwall, and their final establishment at Exeter. The noteworthy points are the school and alms-houses lately erected; then from the high ground, at the back of Downes, a view of the church and town, and a visit to Shobrook-park, where there are noble groups of trees, and an ornamental lake with some splendid specimens of rare water fowl. On the outskirts a good glade subject and an old cottage will be met with on the left of the path. Creedy and Creedy Park will also afford, at this time of the year, some special features; and, as the places are only some two or three miles from Crediton, they can be most conveniently reached, and a choice series may be secured.

THE NEW COPYRIGHT (WORKS OF ART) ACT.

An Act for Amending the Law relating to Copyright in Works of the Fine Arts, and for Repressing the Commission of Fraud in the Production and Sale of such Works.

[29*th July*, 1862.]

Whereas by law, as now established, the authors of paintings, drawings, and photographs have no copyright in such their works, and it is expedient that the law should in that respect be amended: Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:

Copyright in Works Hereafter Made or Sold to Vest in the Author for his Life and for Seven Years after his Death.

1. The author, being a *British* subject or resident within the dominions of the Crown, of every original painting, drawing, and photograph which shall be or shall have been made either in the *British* dominions or else-

where, and which shall not have been sold or disposed of before the commencement of this Act, and his assigns, shall have the sole and exclusive right of copying, engraving, reproducing, and multiplying such painting or drawing, and the design thereof, or such photograph, and the negative thereof, by any means and of any size, for the term of the natural life of such author, and seven years after his death; provided that when any painting or drawing, or the negative of any photograph, shall for the first time after the passing of this Act be sold or disposed of, or shall be made or executed for or on behalf of any other person for a good or a valuable consideration, the person so selling or disposing of or making or executing the same shall not retain the copyright thereof, unless it be expressly reserved to him by agreement in writing, signed, at or before the time of such sale or disposition, by the vendee or assignee of such painting or drawing, or of such negative of a photograph, or by the person for or on whose behalf the same shall be so made or executed, but the copyright shall belong to the vendee or assignee of such painting or drawing, or of such negative of a photograph, or to the person for or on whose behalf the same shall have been made or executed; nor shall the vendee or assignee thereof be entitled to any such copyright, unless, at or before the time of such sale or disposition, an agreement in writing, signed by the person so selling or disposing of the same, or by his agent duly authorised, shall have been made to that effect.

Copyright not to Prevent the Representation of the Same Subjects in Other Works.

2. Nothing herein contained shall prejudice the right of any person to copy or use any work in which there shall be no copyright, or to represent any scene or object, notwithstanding that there may be copyright in some representation of such scene or object.

Assignments, Licenses, &c., to be in Writing.

3. All copyright under this Act shall be deemed personal or moveable estate, and shall be assignable at law, and every assignment thereof, and every license to use or copy by any means or process the design or work which shall be the subject of such copyright, shall be made by some note or memorandum in writing, to be signed by the proprietor of the copyright, or by his agent appointed for that purpose in writing.

Register of Proprietors of Copyright in Paintings, Drawings, and Photographs to be kept at Stationers' Hall as in 5 & 6 Vict., c. 45.

4. There shall be kept at the Hall of the Stationers' Company, by the Officer appointed by the said Company for the purposes of the Act passed in the sixth year of Her present Majesty, intituled *An Act to Amend the Law of Copyright*, a book or books, entitled "The Register of Proprietors of Copyright in Paintings, Drawings, and Photographs," wherein shall be entered a memorandum of every copyright to which any person shall be entitled under this Act, and also of every subsequent assignment of any such copyright; and such memorandum shall contain a statement of the date of such agreement or assignment, and of the names of the parties thereto, and of the name and place of abode of the person in whom such copyright shall be vested by virtue thereof, and of the name and place of abode of the author of the work in which there shall be such copyright, together with a short description of the nature and subject of such work, and in addition thereto, if the person registering shall so desire, a sketch, outline, or photograph of the said work, and no proprietor of any such copyright shall be entitled to the benefit of this Act until such registration, and no action shall be sustainable nor any penalty recoverable in respect of anything done before registration.

Certain Enactments of 5 & 6 Vict., c. 45, to Apply to the Books to be Kept under this Act.

5. The several enactments in the said Act of the sixth year of Her present Majesty contained, with relation to keeping the register book thereby required, and the inspection thereof, the searches therein, and the delivery of certified and stamped copies thereof, the reception of such copies in evidence, the making of false entries in the said book, and the production in evidence of papers falsely purporting to be copies of entries in the said book, the application to the Courts and Judges by persons aggrieved by entries in the said book, and the expunging and varying such entries, shall apply to the book or books to be kept by virtue of this Act, and to the entries and assignments of copyright and proprietorship therein under this Act, in such and the same manner as if such enactments were here expressly enacted in relation thereto, save and except that the forms of entry prescribed by the said Act of the sixth year of Her present Majesty may be varied to meet the circumstances of the case, and that the sum to be demanded by the officer of the said Company of Stationers for making any entry required by this Act shall be one shilling only.

Penalties on Infringement of Copyright.

6. If the author of any painting, drawing, or photograph in which there shall be subsisting copyright, after having sold or disposed of such copyright, or if any other person, not being the proprietor for the time being of copyright in any painting, drawing, or photograph, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply for sale, hire, exhibition, or distribution, or cause or procure to be repeated, copied, colourably imitated, or otherwise multiplied for sale, hire, exhibition, or distribution, any such work or the design thereof, or, knowing that any such repetition, copy, or other imitation has been unlawfully made, shall import into any part of the United Kingdom, or sell, publish, let to hire, exhibit, or distribute, or offer for sale, hire, exhibition, or distribution, or cause or procure to be imported, sold, published, let to hire, distributed, or offered for sale, hire, exhibition, or distribution, any repetition, copy, or imitation of the said work, or of the design thereof, made without such consent as aforesaid, such person for every such offence shall forfeit to the proprietor of the copyright for the time being a sum not exceeding ten pounds; and all such repetitions, copies, and imitations made without such consent as aforesaid, and all negatives of photographs made for the purpose of obtaining such copies, shall be forfeited to the proprietor of the copyright.

Penalties on Fraudulent Productions and Sales.

7. No person shall do or cause to be done any or either of the following acts; that is to say,

First, no person shall fraudulently sign or otherwise affix, or fradulently cause to be signed or otherwise affixed, to or upon any painting, drawing, or photograph, or the negative thereof, any name, initials, or monogram:

Secondly, no person shall fraudulently sell, publish, exhibit, or dispose of, or offer for sale, exhibition, or distribution, any painting, drawing, or photograph, or negative of a photograph, having thereon the name, initials, or monogram of a person who did not execute or make such work:

Thirdly, no person shall fraudulently utter, dispose of, or put off, or cause to be uttered or disposed of, any copy or colourable imitation of any painting, drawing, or photograph, or negative of a photograph, whether there shall be subsisting copyright therein or not, as having been made or executed by the author or maker of the original work from which such copy or imitation shall have been taken.

Fourthly, where the author or maker of any painting, drawing, or photograph, or negative of a photograph, made either before or after the passing of this Act, shall have sold or otherwise parted with the possession of such work, if any alteration be afterwards made therein by any other person, by addition or otherwise, no person shall be at liberty, during the life of the author or maker of such work, without his consent, to make or knowingly to sell or publish, or offer for sale, such work or any copies of such work so altered as aforesaid, or of any part thereof, as or for the unaltered work of such author or maker:

Penalties.

Every offender under this section shall, upon conviction, forfeit to the person aggrieved a sum not exceeding ten pounds, or not exceeding double the full price, if any, at which all such copies, engravings, imitations, or altered works shall have been sold or offered for sale; and all such copies, engravings, imitations, or altered works shall be forfeited to the person, or the assigns or legal representatives of the person, whose name, initials, or monogram shall be so fraudulently signed or affixed thereto, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as aforesaid: Provided always, that the penalties imposed by this section shall not be incurred unless the person whose name, initials, or monogram shall be so fraudulently signed or affixed, or to whom such spurious or altered work shall be so fraudulently or falsely ascribed as beforesaid, shall have been living at or within twenty years next before the time when the offence may have been committed.

Recovery of Pecuniary Penalties.

8. All pecuniary penalties which shall be incurred, and all such unlawful copies, imitations, and all other effects and things as shall have been forfeited by offenders, pursuant to this Act, and pursuant to any Act for the protection of copyright engravings, may be recovered by the person herein-before and in any such Act as aforesaid empowered to recover the same respectively, and herein-after called the complainant or the complainer, as follows:

In *England* and *Ireland*, either by action against the party offending, or by summary proceeding before any two Justices having jurisdiction where the party offending resides:

In *Scotland* by action before the Court of Session in ordinary form, or by summary action before the Sheriff of the County where the offence may be committed or the offender resides, who, upon proof of the offence or offences, either by confession of the party offending, or by the oath or affirmation of one or more credible witnesses, shall convict the offender, and find him liable to the penalty or penalties aforesaid, as also in expenses, and it shall be lawful for the Sheriff, in pronouncing such judgment for the penalty or penalties and costs, to insert in such judgment a warrant, in the event of such penalty or penalties and costs not being paid, to levy and recover the amount of the same by poinding: Provided always, that it shall be lawful to the Sheriff, in the event of his dismissing the action and assoilzieing the defender, to find the complainer liable in expenses, and any judgment so to be pronounced by the Sheriff in such summary application shall be final and conclusive, and not subject to review by advocation, suspension, reduction, or otherwise.

Superior Courts of Record in which any Action is Pending may Make an Order for an Injunction, Inspection, or Account.

9. In any action in any of Her Majesty's Superior Courts of Record at *Westminster* and in *Dublin*, for the infringement of any such copyright as aforesaid, it shall be lawful for the Court in which such action is pending, if the Court be then sitting, or if the Court be not sitting then for a Judge of such Court, on the application of the plaintiff or defendant respectively, to make such order for an injunction, inspection, or account, and to give such direction respecting such action, injunction, inspection, and account, and the proceedings therein respectively, as to such Court or Judge may seem fit.

Importation of Pirated Works Prohibited.—Application in such Cases of Customs Acts.

10. All repetitions, copies, or imitations of paintings, drawings, or photographs, wherein or in the design whereof there shall be subsisting copyright under this Act, and all repetitions, copies, and imitations of the design of any such painting or drawing, or of the negative of any such photograph, which, contrary to the provisions of this Act, shall have been made in any Foreign State, or in any part of the *British* dominions, are hereby absolutely prohibited to be imported into any part of the United Kingdom, except by or with the consent of the proprietor of the copyright thereof, or his agent authorized in writing; and if the proprietor of any such copyright, or his agent, shall declare that any goods imported are repetitions, copies, or imitations of any such painting, drawing, or photograph, or of the negative of any such photograph, and so prohibited as aforesaid, then such goods may be detained by the Officers of Her Majesty's Customs.

Saving of Right to Bring Action for Damages.

11. If the author of any painting, drawing, or photograph, in which there shall be subsisting copyright, after having sold or otherwise disposed of such copyright, or if any other person, not being the proprietor for the time being of such copyright, shall, without the consent of such proprietor, repeat, copy, colourably imitate, or otherwise multiply, or cause or procure to be repeated, copied, colourably imitated, or otherwise multiplied, for sale, hire, exhibition, or distribution, any such work or the design thereof, or the negative of any such photograph, or shall import or cause to be imported into any part of the United Kingdom, or sell, publish, let to hire, exhibit, or distribute, or offer for sale, hire, exhibition, or distribution, or cause or procure to be sold, published, let to hire, exhibited, or distributed, or offered for sale, hire, exhibition, or distribution, any repetition, copy, or imitation of such work, or the design thereof, or the negative of any such photograph, made without such consent as aforesaid, then every such proprietor, in addition to the remedies hereby given for the recovery of any such penalties, and forfeiture of any such things as aforesaid, may recover damages by and in a special action on the case, to be brought against the person so offending, and may in such action recover and enforce the delivery to him of all unlawful repetitions, copies, and imitations, and negatives of photographs, or may recover damages for the retention or conversion thereof: Provided that nothing herein contained, nor any proceeding, conviction, or judgment, for any act hereby forbidden, shall affect any remedy which any person aggrieved by such act may be entitled to either at law or in equity.

Provisions of 7 & 8 Vict., c. 12, to be Considered as Included in this Act.

12. This Act shall be considered as including the provisions of the Act passed in the Session of Parliament held in the seventh and eighth years of Her present Majesty, intituled *An Act to Amend the Law relating to International Copyright*, in the same manner as if such provisions were part of this Act.

Meetings of Societies.

MANCHESTER PHOTOGRAPHIC SOCIETY.

A MEETING of this Society was held at the Literary and Philosophical Society's Rooms, on Wednesday, the 6th ult.,—Mr. Parry in the chair.

The CHAIRMAN called the attention of the members to the subject of the circular—namely, that it was proposed to consider the desirability of framing a rule to prohibit any discussion in the Society as to patents or matters connected with trade; but, as many members of the Society who took a great interest in the matter were absent, and, as it was thought better for the subject to be thoroughly discussed, it was, after some conversation, moved by Mr. Offer, seconded by Mr. Young, and carried, that the discussion of the subject named in the circular be postponed until further notice.

Mr. Petschler exhibited a new shutter for taking instantaneous stereoscopic views, which could be adapted to any camera. [See page 330.] This contrivance was very highly thought of by the members, and a vote of thanks was passed to Mr. Petschler for explaining and exhibiting the apparatus.

Mr. Young exhibited several large photographs of waterfalls by the collodio-albumen process, which were very much admired.

A general and interesting conversation took place among the members, and after a vote of thanks to the Chairman the meeting closed.

Notes of the Month.

THE crowded streets of the great Metropolis present little indication to the uninitiated eye that "the season" is over; yet, nevertheless, it is quite concluded, and *everybody* who is *anybody* is out of town. It is but the adventitious attractions of the Great Exhibition which makes them wear the semblance of that which "is not."

Some ancient wells have been discovered at Paris, near the Boulevard de Sebastopol, together with a large quantity of old Roman relics. Much regret has been expressed in all countries at hearing that these wells have been destroyed without any plan or drawing of them being secured. Where were the Parisian photographers that their commercial instincts did not lead them to secure such valuable negatives?

We saw, the other day, a lady's fan—beautifully painted, exquisitely finished and elaborately carved in ivory—in the handle of which was a very elegantly inserted photograph of the owner, who stated that it had frequently been the means of restoration when lost at both public and private assemblies. This being a perfect novelty the mention thereof may serve as a valuable hint to the fan manufacturers.

To the American Department at the International Exhibition a number of photographs have been added, including a series called *Brady's Incidents of the War*—remains of railway depots presenting little but masses of *debris*, a melancholy spectacle of the sad havoc of war—forts, entrenchments, and *Father Mooney Administering Mass to the 69th Regiment; Bridge at Bull Run*, &c. Mr. Brady also exhibits some interesting portraits of very large size, 18 by 16, though much worked upon, including His Royal Highness the Prince of Wales, Fremont, Seward, Jefferson Davis, and others.

Some exceedingly large views of the lakes, valleys, gigantic trees, and almost untrodden solitudes of the interior of California—where do not photographers penetrate?—by C. E. Watkins, are worth attention, though much faded.

A work is in the press by the Rev. T. R. Birks, *On Laws of Atomic Force*, intended as an introduction to a perfect theory of "light, heat, electricity, and the nature of the chemical elements."

We learn from *Le Bulletin de la Societé Francaise de Photographie* that M. Mazac (a druggist) announces the discovery of a bromo-iodo-cyanide metallic salt suitable for sensitising collodion adapted for taking very rapid proofs, and not liable to deterioration by keeping, the composition of which, however, is not disclosed. "Instantaneous" work is evidently attracting much attention, as evinced by the numerous schemes brought forward for effecting rapid exposure. M. Adolphe Martin brought forward at the last meeting of the French Photographic Society a new formula for a developer, indicated by M. Collin, and calculated to increase the energy of pyrogallic acid. The formula stands thus:—Prepare a solution of alum 25 grains to each ounce of pure water (distilled or rain). For use mix two measures of the preceding with 38 of water (free from lime), and one part of alcohol. This is to be shaken up and allowed to settle till the air bubbles are dissipated, and to 410 cubic centimetres of this mixture add 15 grains of pyrogallic acid. It is to be poured on to the plate without any addition of silver solution; and when the image has been developed it may be strengthened by a further quantity, *with* the addition of a few drops of a solution of nitrate of silver and citric acid in the proportion of about 15 grains of the former to 20 of the latter to each ounce of water.

The most important event of the past month worth recording is the fact of the new Copyright Bill coming into immediate force. The inclusion of photography in this Act will do more for the recognition of photography as a Fine Art in the public mind than all the ingenious, hair-splitting argumentation ever devoted to the subject. It is better—wiser—always to give the widest interpretation to the term "fine art." Nothing is more difficult to define, even by the most subtle artistic theorist, than the point where industrial art ends and fine art begins. No doubt the faculty for art, through its whole range, is essentially the same, however much it may differ in kind or degree. The extreme division and subdivision of walks of art in the present day is a distinguishing and, perhaps, baneful feature. In antique times men were sculptors, painters, architects, goldsmiths, workers in metal, engravers, and even potters, at one and the same time. Such was Michael Angelo, Raffaelle, Della Robbia, beside a host of lesser lights too many to enumerate. Now we have engravers upon copper who know nothing of wood, and painters in water-colours who cannot work in oils, &c., &c. S. T.

Scraps and Fragments.

PHOTOGRAPHY AT THE BOTTOM OF THE SEA.—A curious discovery has been made by a photographer of Paris, by which he possesses (as he alleges) the means of producing a picture of the bottom of the sea.—*Parthenon.*

PHOTOGRAPHY AND BOOK ILLUSTRATIONS.—There is now in course of preparation an album of Swabian Poets, with photographs and biographical sketches of Uhland, Kerner, Meyer, Schwab, Hölderlin, Mörike, Hauff, and Fischer.—*Parthenon.*

THE PHOTOGRAPHERS' MUGGY WEATHER.—To most persons this kind of weather is most oppressive—not fit to do anything upon; but a photographer takes a very different view of it. He calls that weather "muggy" which is best adapted for taking a person's "mug."—*Punch.*

A BIT OF GOSSIP.—We extract the following from the letter of a very respectable provincial photographer, and leave to time the duty of confirming or refuting the statement to which it refers. Our correspondent says:—"I was told by ———" (a distinguished gentleman, who *very* recently received his first lesson in photography, but who is, nevertheless, one of the Jurors in Class 14) "that a sealed packet had been sent from France, said to contain photographs in colours, which were not yet permanent in light, to be opened by the Jurors previous to making their awards."

WARNING HINT TO PROFESSIONAL PHOTOGRAPHERS.—A new trick to which many photographers have fallen victims is now extant. A respectable looking personage calls upon you, soliciting advertisements for a new and attractive work, issued in monthly parts, of which he exhibits a copy. Your advertisement will be inserted, if you become a subscriber for the work, without further cost. Struck by the idea, you give the order, and receive monthly two copies of the work, one for the past and one for the coming month in which your advertisement duly figures with many others; but a few inquiries will soon convince you that these advertisements only appear in the copies supplied to you and your more immediate neighbours, while in copies printed for other neighbourhoods your advertisements will be found wanting.

ANOTHER KICK FOR THE ROYAL COMMISSIONERS.—The *Athenæum*, discoursing of the cartoons and stained glass in the International Exhibition, has the following:—"It is needless to say what great works are unrepresented even by photography, and how more than one series of characteristic and noble designs, the most ambitious of modern productions that decorate the great cities of Germany, is here undiscoverable. With regard to stained glass, its position amongst ourselves is so characterised that it does not appear in the Fine-Arts Catalogue at all, but must be sought for in the same section which comprises table and garden glass, ventilators, and the like. If this rule was observed, why do we not find the pictures set down to the artist's colourmen who prepared their pigments, and the cartoons to the paper-makers' stalls?"

PHOTOGRAPHY AND THE WITNESS BOX.—We notice in a recent report in *The Times* of the trial in which Mr. W. Roupell, late M.P. for Lambeth, is implicated, under his own confession, in a charge of forgery, that, in order to avoid the chance of any clerical error, a photograph of the forged will was taken as "copy" for the compositor. Some of our readers will remember a similar case cited by our friend Mr. Forrest, of Liverpool. When an account for glass supplied by him to the order of a certain nobleman was sent in it was disputed, on the ground that he had not ordered it, and that the builder was liable. Fortunately Mr. Forrest had a written order, in the form of a letter, from the disputant, and, instead of parting with the original, he prudently sent him a photographic copy of it, which so thoroughly satisfied the writer that he immediately discharged the disputed account.

REPRESENTATIVES OF SCIENCE.—Messrs. Walker and Zobel have published a large group of fifty figures, designed by Gilbert, representing the more eminent scientific men of the last century. The portraits are from original paintings by first-class artists, save in two instances in which the engraving is from "that artistic application of chemistry and actinism—the photograph." Bryan Donkin, the Northumbrian engineer, lived in a day late enough to sit for a Daguerreotype by Beard; and the venerable Francis Ronalds, who, half a century ago, gave the first demonstration of the practicability of the electric telegraph, by sending a message through a coil of wire ten miles long, insulated in a trench which he had dug in his garden at Hammersmith, has also been depicted by means of heliography.* The grouping is a fine study for the photographic portraitist, and the background, being the library of the Royal Institution, is appropriate and suggestive.]

* *Daily Telegraph.*

THE THEOLOGICAL SOCIETY.—In his review of the scientific meetings, *Mr. Punch* informs us that at the last meeting of the above, "Signor Fuoco exhibited a photograph of the edict in revocation of that of Nantes, and Mr. Fyer Brand exhibited photographs of Mr. Miall and Dr. Vaughan."

THE INTERNATIONAL EXHIBITION.—We learn that the Commissioners have declined to undertake the publication of the reports made by the jurors on the progress of industrial arts since the Exhibition of 1851; and they will, with their sanction and concurrence, be published by the Society of Arts. Dr. Lyon Playfair has undertaken to superintend their publication. They will form one volume, to range with the reports of the Great Exhibition of 1851. Then, too, we hear that a very important step has been taken by the Commissioners towards repairing the alleged injustice of some of the decisions of the juries. The merit of establishing a precedent for re-opening the decisions must be conceded to Mr. Trotman* * * This is a most important concession, and a most equitable one, and will, no doubt, lead to a rather extensive revision of the list of awards.—*Illustrated London News.*

PHOTOGRAPHY AND THE PRINTING ARTS.—Electricity and Photography seem destined to work great changes in the printing arts. Though they can never supersede the artist or the handicraftsman, they may modify his operations. As regards the enlargement or reduction of prints by photography, and their reproduction, those exhibited by Sir H. James, of the Ordnance Department at Southampton, bear the closest scrutiny. His photo-zincographic prints from the *Doomsday Book*, and a print—*The Election*, by Hogarth—are repetitions to astonish a connoisseur, it only being by size and texture that a difference is discernible. Photographs from nature mounted in printed books have never been happy, rarely suiting as illustrations of the text, or according in tone with the type. Apart from their liability to fade, they make volumes look clumsy, anything but solid, and apt to gape open. Of processes to supersede the labours of the wood-engraver—a long-cherished idea with inventors—we are shown one or two examples, Mr. W. J. Linton showing one he terms "kerography," producing brilliant results in the hands of an artist, but somewhat speculative for general use in pictorial effects.—*Athenæum.*

THE SOCIETY'S CATECHISM.—The Council of the Society of Arts have sent *Mr. Punch* a set of questions upon the subject of awards for merit. Any man who can write can answer a letter, says Mr. W. SHAKSPEARE, and *Mr. Punch's* caligraphy being indisputable, he can hardly escape from replying to the Council, but he is by no means certain that his responses will give unlimited satisfaction to the querists:—

Questions.	*Answers.*
1. Are you of opinion that awards for merit, by medals or otherwise, in International Exhibitions are desirable?	1. No, Council.
2. State the reason for your opinion?	2. Because, Council, they are always given to the wrong people.
3. Ought works of fine art and designs to be excluded from the awards.	3. Yes, Council, because a party capable of such works wouldn't thank stupid judges for twopenny medals.
4. Can you suggest any better method than the appointment of jurors for making the awards.	4. Anybody is better, Council, than a juror, as juries go in these days.
5. Can you suggest any improvement in the constitution or proceedings of the juries?	5. Yes, Council, kick them into the street.
6. Is any appeal from the decision of juries desirable?	6. Yes, Council, to *Mr. Punch* and common sense.
7. If you think awards undesirable, can you suggest any other means by which meritorious productions may be brought to the notice of the public?	7. Yes, Council, let the best specimens be presented to *Mr. Punch.*
8. Have you any further suggestion to offer on the subject?	8. Yes, Council, that *you* abstain from meddling in the matter.

If the above replies, given with *Mr. Punch's* usual ready affability, prove of the least use to the Council, he is satisfied. He has certainly embodied the popular opinion on the subject. To judge by the incessant and angry protests against everything that has been done, it would seem that the public have a fine classical sense of the derivation of the word Jury, and regard it as meaning a Party to be Sworn at.—*Punch.*

* An exhibitor whose very important invention was most unfairly described in the list of awards.

New Books.

Photographic Difficulties: How to Surmount Them.— Instantaneous Pictures: How to Obtain Them. By T. Cadby Ponting.

(Bristol, Ponting, 32, High-st. London, Bland & Co., 153, Fleet-st.)

Mr. Ponting's name is sufficiently familiar to photographers as a celebrated maker of collodion, and his collodion is well known to possess qualities differing somewhat from those pertaining to the products of any other maker.

As a practical photographer we are not familiar with this gentleman—we do not remember having met with his works in any photographic exhibition; but it is scarcely to be presumed that one whose attention has for so many years been devoted to improving and trying to make perfect the "chief corner stone" of modern photography, should be other than well acquainted with the practical manipulation so necessary to the pursuit of our art. And, accordingly, we find on perusing the work before us evidence that he does possess the needful knowledge—whether acquired in the field or the operating-room, in producing pictures or in making mere experiments, is of little moment.

In addition to personal information we perceive, also, that Mr. Ponting has not neglected photographic literature, as several disputed questions of recent date have met with attention and examination at his hands. We are much pleased at finding that in nearly every case the decision at which he arrives corresponds very closely with our own; and with regard to one in particular—viz., the use of bromides in collodion—we cannot forbear expressing much satisfaction at the frank and straightforward manner in which the author avows a modification of the opinion formerly entertained by him, dependent, however, upon modified conditions of the premises.

In the preliminary observations we find very sound advice given. As a sample we take the following:—

"The inevitable trials and difficulties of the young photographer are quite enough without his having to contend with the additional one of imperfect apparatus, &c., and, as the selection of the lens is of paramount importance, it should be strongly impressed upon him that he cannot have one lens that will answer all purposes. A lens that is declared to be adapted for all purposes is nothing but a delusion and a snare, and it would be a very false economy to invest in one; for be assured of this, that it cannot do so well as the lenses prepared for only one purpose, and it is not possible in the nature of things that it should."

There are ample but not redundant instructions relative to taking negatives, with a record of a few telling experiments in illustration of some of the points insisted on. Then follows a chapter on failures, their causes and remedies; and another on taking positives on glass, of which we have only to remark that the matter is generally good.

The chapters on printing, toning, fixing, and washing, are specially to be commended. We have very little exception to take to any of the directions given, and heartily concur in most of them—that relative to washing the prints especially deserving attention, the advantage of frequent changing of the water over the practice of keeping the proofs for a long time in running water being forcibly illustrated. Our readers will remember that this is a point upon which we have frequently insisted.

The closing chapter is on "Instantaneous Pictures," and a very excellent one it is. In it is discussed the question of the value of bromides as accelerators, and certain crucial tests applied to decide the point which are so interesting that we are tempted to make the following short extract:—

"This alleged fact of bromine being an *accelerator* was quite contrary to my own previous experience; for, in all experiments with this material, I found that it not only retarded the action, but produced a thin, weak negative. But, considering the known ability of these gentlemen, and the high-class works produced by them, it appeared worth while to go over the ground once more, to endeavour to find, if possible, where the discrepancy on such a matter of fact as this could possibly arise.

"Five samples of collodion were prepared as follows:—

"No. 1, iodised collodion, containing 4 grs. of iodide to the oz.
No. 2, the same iodised collodion, with ½ gr. of bromide added.
No. 3, " " " 1 " "
No. 4, " " " 2 " "
No. 5, " " " 4 " "

"Three nitrate of silver baths were also prepared, of the strength of thirty grains to the ounce.

"No. 1. This bath was made according to the formula at page 22, with acetate of soda and acetic acid.

"No. 2. To this bath was added a quarter of a drop of nitric acid to each ounce.

"No. 3. This was left neutral, or nearly so, having a very minute proportion of acetic acid to prevent fogging.

"The developer was made with—

"Protosulphate of iron ..... 10 grains.
Glacial acetic acid ..... 6 drops.
Water ..... 1 ounce.

"Two negatives were taken with each sample of collodion: one exposed two seconds, and the other four seconds, in the three baths in succession—being thirty negatives in all. A landscape lens with a small stop was used, in order to secure complete accuracy and uniformity in time of exposure, which it would have been difficult to obtain with so many negatives, had a shorter exposure been tried.

"Without wearying the reader with a detailed account of all the negatives, it will suffice briefly to state the results that came out.

"First, as to the baths. With the ordinary iodised collodion No. 1, the bath No. 1, with acetate of soda and acetic acid, was unmistakeably the quickest of the three—the nitric acid bath, No. 2, being very slow. This, it will be remembered, is the precise result of the experiments detailed at page 19, except that a bath with nitric acid was not then tried. But with the collodions containing bromide, the No. 2 bath with nitric acid proved to be much quicker than the other two baths, their slowness, as compared with the nitric acid bath, increasing as the proportion of bromide in the collodion increased. No increase of sensitiveness was gained by the large doses of bromide. On the contrary, the collodion No. 5, with four grains of bromide per ounce, worked much slower than either of the other samples. The proportion of one grain of bromide to four grains of iodide gave the best results: larger doses of bromide imparted a wavy appearance to the film that quite spoiled the picture, and no increase of sensitiveness was obtained.

"On comparing the negative taken with the No. 1, on iodised collodion, in the bath No. 1, with the negative taken with bromo-iodised collodion, in the nitric acid bath, the latter was markedly the better. The first was a very intense negative, with strong contrasts of light and shadow, and would have printed hard: the latter was a soft, though a sufficiently forcible negative, giving full details in the shadows, and hardly wanted further development; but, with *instantaneous* pictures, the development will have to be continued by using a weak solution of pyrogallic acid, with a little silver added, say—

"Pyrogallic acid ..... 1 grain.
Glacial acetic acid ..... 6 drops.
Water ..... 1 ounce.

Solution of nitrate of silver (strength, fifty grains to the ounce) five or six drops, or more if great intensity be required.

"The iron developer must be previously washed off.

"These experiments, which have since been fully confirmed in practice, clearly demonstrate that, for instantaneous pictures, it is necessary not only to use bromide in the collodion, but a small proportion of nitric acid in the bath. These, with an iron developer as strong as the operator can use, as descibed at page 30, strengthening by the use of the pyrogallic developer, is all that is requisite in the way of chemicals; but it must be borne in mind that everything must be of the highest degree of purity, and prepared with the utmost care."

The little work is a very useful one—is very unpretending; and, though the author disclaims any intention of attempting to instruct those already acquainted with our art, many useful hints may be gathered from it even by some professional photographers.

There is a good index, and, what in our opinion is of nearly, if not quite, equal value, a breviate of each paragraph appended in the margin, after the fashion of Acts of Parliament—a convenience which removes nine-tenths of the trouble, and all the annoyance, dependent upon reference to any particular part of a work.

We have said enough to show that our opinion indicates a pretty extensive circulation for this little work.

Foreign Correspondence.

Paris, August 26th, 1862.

In some of my former letters I have given an account of the different shutters recently invented to facilitate the obtaining of instantaneous proofs. M. Darlot has just invented another, intended for the same purpose, which I will now proceed to describe. The instrument consists of a hollow disc, 2 c. (8-10ths of an inch) thick, in the centre of which there is an opening equal to the diameter of the object-glass. Inside the disc there is a small barrel containing a watch-spring and ratchet wheel, with a catch to hold the barrel when the spring is wound up. The axis of the barrel projects outside in front of the apparatus, and on its extremity is a brass plate, with an opening in it like that in the disc. When the spring is uncoiled, this plate covers the object-glass. By turning it round, the two openings are brought to coincide, which allows the operator to get his focus. By continuing the rotatory movement, the opening is again closed by the brass-plate. By gently pressing on a small lever behind, when operating, the catch is raised from the ratchet, and the spring runs down. The plate in returning to its first position thus masks and unmasks the object-glass, with greater or less rapidity according to the strength of the spring or the tightness with which it is wound up. To deaden the shock produced by the stopping of the plate M. Darlot has introduced a small piston, something like the buffer of a railway carriage, which bears on the end of a steel spring.

This apparatus can be fixed over any object-glass by means of a collar and screws.

Of all the shutters which produce useful effects in the hands of their inventors, but still do not satisfy the generality of operators, the most complete, in my opinion, are the sliding ones invented by Mr. England. Many persons, however, are still actively engaged in experiments on this kind of apparatus, and we shall, no doubt, have a satisfactory instrument ere long.

Some impatience is manifested to know what decorations will be granted here to those who have exhibited in the Photographic Department, in London. Several have valid claims which it may not be uninteresting to notice here.

In the first rank I place M. Claudet, who was passed over in 1851 and 1855. You know his claims as well as I do; and I am persuaded that his nomination in the Legion of Honour would be as well received in England as in France, for his labours have been profitable to all. As an inventor, M. Poitevin, too, has rights which, I think, no one will venture to dispute, with the exception, perhaps, of those who have been most benefited by his discoveries.

M. Bayard comes next by right of seniority. His first productions date from the time of Daguerre, and his reputation is based exclusively on them. He is the father of French photographers; but many persons, and myself among them, are inclined to reproach him for having kept all his photographic improvements too much to himself. Publicity alone can secure progress in any art, especially in one so near its infancy as ours. Le Gray's communicativeness would, no doubt, have already procured him the decoration if he had not disappeared from the photographic world, for none can forget the services his process has rendered.

As practitioners and artists, MM. Bisson Brothers have universally recognised claims to an exceptional recompense. The perfection of their works, the number of their productions, the boldness of their undertakings, and the development they have given to photography as an industrial art, render them especially worthy of distinction. The ascent of Mont Blanc would be alone a sufficient title. They are also among the veterans of the Daguerreotype.

In France the choice must necessarily fall among these I have mentioned; but we shall, no doubt, know the decisions very shortly.

The action between Poitevin and Charavet, the purchaser of Fargier's patent, has been brought before the tribunals, and professional men have been appointed to report on the case. The joke of this affair is that Charavet is the plaintiff, and also cleverly demands the annulment of Poitevin's patents; but, on the other hand, this same Charavet, not wishing to pay M. Fargier the 30,000 francs he owes him for his patents, also attacks the very patent he has himself purchased. The whole affair is incomprehensible. There is no doubt as to the issue. Fargier's patent will assuredly be annulled, for we all know what are its merits. We shall be none the less indebted to him for an ingenious process. As to Charavet, he will have profited by the labours of others, and have even obtained a reward at the International Exhibition without any other merit than a dexterous use of puffing. ERNEST LACAN.

Philadelphia, August 11th, 1862.

As my last letter closed without exhausting my memorandum-book it would be well to wipe out the old account before taking up fresh matter.

Dr. O. W. Holmes has had executed for him, by Mr. Whipple, of Boston, a good stereograph of one of the wonderful Japanese crystal spheres (pure quartz), and it has given pleasure to many of his friends who have had no opportunity of examining the curiosity itself. The sphere rests on a small table, and is the only object in the room in focus; but pictured on its surface can be seen all its surroundings, and even objects through a window and across a street, all quite sharp and distinct. He says also (speaking of the stereographs he so much wants): "I have a view of one of the entrances of Strasburg Cathedral, but I have never seen one of the spire, which I ascended many years ago. The towers of Bologna must have been taken a hundred times, yet I have never seen a stereograph or photograph of them or either of them."

Speaking of stereographs, Mr. Creemer, of the International Stereoscopic Company, in Philadelphia, says that the sale of these pictures has increased very much indeed, and has become once more a trade of some importance. The views of the Great Exhibition are anxiously looked for on this side of the water, and will, no doubt, meet with a ready sale.

Mr. Wilson, of the Wheeler and Wilson Sewing Machine Company, has contrived and patented quite an ingenious apparatus for working wet collodion in the field. It is described as being very portable and convenient to manipulate. No doubt a description of it has reached England before this. I have not seen it.

In the application of a new substance in photography, I would mention that, in the preparation of hard rubber goods, such as handles for cutlery, &c., the articles are made hollow, and contain within them a liquid which has been made to serve a curious purpose. Suppose, for instance, that the article to be produced is a ring of this hard rubber, six or seven inches in diameter of circle, and one inch diameter of rim (they are used in machinery for high balance or hand-wheels). To make them, leaden moulds of the proper shape are prepared, and a ring of the gum material is cemented up with some water in it, and is placed in the mould, and the mould, finely clamped, is shut. The heat of the oven in which they are baked converts the water into steam, and presses the gum out against the mould in every direction, and in this condition they gradually harden, and some of the water remains in them after they are cold. Holes are drilled into the rings to let out this water, and the fluid discharged seems to have a pressure of gas in it within, and is saturated with sulphuretted hydrogen. It is of a greenish-yellow colour, and answers admirably for strengthening purposes after the use of bichloride of mercury on wet collodion. I mention it as new only in regard to the source from which the liquid is obtained.

A memorandum of "Patent Laws" reminds me that some allusion has been made of late in THE BRITISH JOURNAL OF PHOTOGRAPHY to the loose way that patents are granted in England. In a former letter brief mention was made of essential differences between the English and the American Patent Offices. It may have been inferred from what I then said that in America worthless claims were of less frequent occurrence than in England. This is not so, however. The low patent fee prompts many to apply who could not afford to pay the large English fees. Every week we see published in the *Scientific American* a long list of patents, very few of which will ever pay their owners a single dollar, and many of which have been forced through the office by claims to some trivial device which may be new, but of no avail, as this one will conflict with other claims covering the whole invention; just as if a man claiming some special device for tipping the front of a camera could be debarred from using it by one whose claim broadly covered the so arranging the camera that the axis of the tube may be square with the plate, or capable of being adjusted in any angle to it. The admirable system of publishing all the English specifications puts it in the power of any one desiring so to do to be well assured through their agents of the originality of their inventions. But inventors are too apt to think that a patent once obtained their fortune is made. In England the examination is made by the people interested after the patent is issued: in America as thorough an examination as can be made under the circumstances is instituted by the officer, and a very large proportion of the claims are rejected, and some after-litigation is avoided.

Professor Edwin Emerson, of Troy, with Professor C. Himes, of the same place, passed through Philadelphia a few days ago, and spent the short time they were here with your correspondent. Mr. Emerson will sail for England in the same steamer with this letter, and he will be the bearer of letters from me to my friends abroad. He tells me that an article from his pen and also one from Professor O. N. Rood: the first *On the Appearance of Relief*, and the latter *On the Spectroscope*, will shortly be published. Professor Rood sends a stereograph of his two-prisms spectroscope; but I hear he is now making one with four separate prisms. All seem to concur in praising Mr. Rood's ingenuity and originality. He is a most indefatigable worker, and yet finds time for much that is amusing. He has been photographing some of his original sketches made abroad, and one would imagine that he has a keen perception of the ludicrous. It is astonishing how much can be learned by photographers coming together and seeing one another's work. Talking does not do, and writing is no better. From Messrs. Emerson and Himes, who work in the same room, we learn that they dry their tannin plates by hanging them up on a line, one corner being caught in a patent clothes clip. They dry all wet plates in this manner, and it seems to answer a good purpose. They flow with tannin and do not immerse in a tannin bath as we do here. They also say that they have tried many experiments in keeping tannin plates after exposure and before development for a month at a time, and can see no deterioration. They use these tannin plates for transparent positives, but print them with the camera, and not by superposition. They do so principally because their stereoscopic negatives are taken on plates five by ten inches, and these five-inch square pictures can be thus reduced to the usual size, and will include a larger visual angle than usual. At first they were well pleased with the use of chloride of uranium in the toning-bath, but have now abandoned it as a needless complication.

Speaking of toning, a great cry was raised in all parts of our city last week by an universal attack of yellow fever in the prints. The disease seemed quite universal, and the epidemic may have had its origin in atmospheric causes; for the weather seldom has been hotter than it then was. Had the disease been sporadic in its appearance we could have shrugged our shoulders and exclaimed, as we are apt to do when no good reason can be given—"Some error in the manipulation!" Chloride of lime seemed to be the specific resorted to in this case with markedly good results. A toning-bath made of acetate of soda, common salt, and the gold neutralised with bi-carbonate of soda, is poured into the water impregnated with chloride of lime. The solution looks milky. The prints must be deeply printed, but not much overdone. They whiten rapidly in the bath—*i.e.*, the paper does—and they tone with great rapidity and uniformity. Oh! by-the-bye, Mr. Himes will make his first appearance in print shortly. I do not know the title of his article, but judge that the matter will be interesting.

Our Amateur Exchange Club has had some new members added to it, and a marked improvement is manifested in the proofs. The large majority of the last exchange were from tannin plates, but Mr. Dickenson Sargeant sent his exchange of the *Kennel* from a wet plate. His pictures of animals are wonderfully good. He seems to have made the portraiture of the brute creation a speciality, and no one will dare to compete with him here.

I see by the advertising columns of our daily papers that Broadbent and Co. have found a name for a new style of coloured photographs lately issued by them. They call them Wenderotypes, after Mr. Wenderoth, their inventor. They are albumen prints, so prepared as to receive the colours in successive washes, and they are finally protected by some kind of varnish which gives a good gloss, very similar to the gloss of albumen, but which is waterproof. I could not detect any smell of varnish, and the whites are very pure. They are colouring a very large number of card-pictures in this manner. Their solar camera is now in successful operation, and does all that is required of it. I saw it at work, and the negative in use at the time was quite strong enough to print in diffused light by contact. The operators walked about the room with impunity, and no tremor was observable either in the instrument or on the print. A proof will soon be ready, they promise, for Mr. Shadbolt to show his friends. Three spots of a brownish hue are observable while printing; but they do not seem to affect the print. They are due to some blisters which have come in the balsam between the glasses of the great condensing lens. As I have before said this lens receives the direct rays of the sun, no reflector being used.

Testimony is now fast accumulating to show that the writer of the article quoted in my last letter was right in saying that in his opinion a chromatic condensing lens could exert no deleterious influence over the copying tube. Mr. Wenderoth has shown me very sharp proofs made with his old condensing lens, which was not achromatic, and Mr. Rood's experiments in using a common burning-glass prove the same thing.

Regarding the ownership of negatives, some of our principal establishments are now making an extra charge for the negatives to those who wish to keep them in their own possession; and they say that, in nine cases out of ten, people are more apt to have extra prints made if they own the negatives, and will mostly have the printing done by the artist who made the negative. Besides, it saves much trouble in keeping a large stock of them on hand, and brings them in some more ready money; so that they now rather encourage the purchase of the negative by each person who has had a sitting.

Nothing new has come to light in instantaneous dry photography, and I have heard but little about hot water. Mr. Thompson, who has worked Anthony's solidified milk process, seems to consider it much better than tannin. Anthony's *Wind Gap* on that kind of plate is one of the gems of my collection. Some few of our amateurs have been using various strengthening solutions with the tannin plate, bringing out the detail with pyrogallic acid, and acquiring intensity by mercury, &c., instead of pushing the pyro., which they say fogs the distance too much. Some time ago all negatives were strengthened after fixing by alternate application of silver and iron.

An amusing incident has occurred with one of our friends who was photographing locomotives. He did not label all his bottles, and there was some uniformity in the shape of his vials. His negative was not quite strong enough. He asked his companion to hand him the silver bottle. The plate was flowed, then treated with iron and washed; still it was not what he wanted, but was *manifestly improved*. Some three applications being made it was pronounced perfect, and was ready to be treated with a weak solution of gum arabic before drying, to keep the film fast: when, lo! and behold! it was the *gum bottle* which had been doing service all this time for *silver*, and all the increased intensity was in the operator's imagination. Gum arabic has since been called "Burnham's intensifier!" He laughs, and says it does *strengthen* the negative—that it is not near so apt to *become transparent* by peeling off the plate.

Speaking of quick dry-plates the other day, one gentleman remarked that he had once placed his camera in a window, in such a position that when the plate-holder was in place he could not draw out the shutter. He thoughtlessly removed the shield, drew out the shutter in broad daylight, and replaced the exposed plate in the camera, and he knew in an instant how foolish he had been; but still, as a matter of curiosity, he completed his exposure, developed the plate, and got a good picture. He says slow plates are the best.

Some little correspondence has been conducted concerning the International Exchange Club, but the unsettled state of our country will delay any steps in that direction. We may all have to lay by our cameras and shoulder a musket; for, enjoying the blessings of so good a government, we must be ready to stand by it in its sore trial. The cities of the North are once more noisy with the tramp of armed men, as the last call for six hundred thousand soldiers is being responded to with hearty good will.

COLEMAN SELLERS.

Marriage of the Prince of Wales.—The dogmatic outburst of indignant abuse against photographers for giving point to a rumour in connexion with this subject, which recently appeared in the columns of that mighty self-constituted authority, the *Court Journal*, has now a comment in the fact that the photographers were right and the great fashionable oracle very ludicrously wrong. We quote the following from the *Daily Telegraph*:—"He (the Prince of Wales) will espouse, and at no more distant date than the ensuing spring, the Princess Alexandra of Denmark. The intelligence, welcome to all, will surprise none, for in these days of universal publicity, the name and rank of the young Princess upon whom so great an honour was to devolve have long been mentioned freely in society. What is more, the new and charming art of photography, which has made us familiar with the external appearance of everybody of note or importance, and of a great many people neither noteworthy nor important, has boldly discounted the announcement we now make to our readers by presenting to them in every other shop window the portrait of the affianced bride."

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

SCIENTIFIC RESEARCHES.

To the Editor.

Sir,—I had promised you an article on the theory of the formation of images in the camera; but, as I desire above all things to avoid repeating what others have said before me, I intended, before writing, to apply my new method of optical analysis to the clearing up of some important points in connexion with this theory.

While waiting to mature my thoughts and complete my experiments on this article, I propose to communicate to you some experiments, certainly very curious, and in which those of your readers who are engaged on the same subject will, doubtless, take a lively interest.

1. In the famous experiment of Mr. Young, who developed the picture after fixing, *the formation of the image is not due to iodide of silver*. Mr. Hardwich has distinctly shown that albumen forms a combination with nitrate of silver, which is sensitive to light, and that such compounds were also formed with several other organic substances. Moreover, in several processes, such as the albumen and waxed-paper, there is a visible image before the application of the developer, *i.e.*, on withdrawing the sensitive surface from the camera.

In the paper which I propose to send you I shall prove that this visible image is not due to the iodide of silver; and it is precisely this image which is, in the experiment of Mr. Young, the cause of development, even after the removal of the iodide of silver by hyposulphite of soda.

Regarding the subject from this point of view, it would follow (unless I had indubitable proofs to the contrary) that all those processes regarded as rapid—such as the collodion, calotype, cellulose, and Daguerreotye—would form exceptions; while the slow processes having the same base of iodide of silver, and an organic substance—such as albumen, gelatine,

serum, wax—give, notwithstanding, an image on development after fixing.

In order to avoid over-stating the matter, it should be added that the images hitherto obtained in this way have not been so satisfactory as those yielded by the ordinary method of development; but, were it not for this, the iodide of silver might be suppressed in practice. But we do not propose to consider this fact, except in a scientific light.

2. Here, Sir, is a series of experiments, if possible, more curious.

When, according to your illustrious compatriot Hoffman, acetic acid is treated with chlorine at a temperature of 120° centigrade, it is transformed into *mono-chloracetic acid*. On distilling the product and collecting apart that which comes over at 180° a pure product is obtained.

The chloracetate of silver is extremely sensitive to light. Heated with bases, it yields glycollic acid. During my researches on the salts of silver I had dissolved chloracetate of silver in ammonia, which I had placed in a stoppered bottle and exposed to direct sunlight. At the end of a few weeks and *under the influence of light, violet-coloured* crystallised chloride of silver was formed. The accuracy of this experiment I propose to establish by numerous repetitions. The following conclusions are deducible from it:—

a.—Light, in acting on the ammoniacal solution of chloracetate of silver, forms a violet crystallised chloride, and glycollic acid.

b.—This reaction was not induced by the *heat* of the solar rays, since no effect was produced on the mixture contained in a blackened bottle.

c.—The composition of the violet chloride was variable, and the more slowly the action proceeded the richer was the chloride in silver.

d.—That the violet chloride of silver was not a mixture of metallic silver and ordinary white chloride, because nitric acid at a temperature of 90° centigrade did not whiten it nor did it reflect light under the microscope.

These experiments will doubtless prove very interesting to the distinguished chemist who has so well described chloracetic acid.

3. Finally: valeric acid treated with a current of chlorine under the influence of light, yields chloro-valeric acid. *The chloro-valerate of silver is soluble in nitric acid. Light precipitates from this solution a violet chloride of silver*, and again, in this instance, with a variable proportion of silver. How can it be supposed that the violet chloride is a mixture of metallic silver and ordinary white chloride? We see it produced actually *in* nitric acid, the solvent *par excellence* of metallic silver! But this subchloride, unfortunately, is remarkably unstable. Bromide of silver is even still more unstable: it assumes, under the influence of light, the grey colour of reduced silver; but in the article which I am preparing for your Journal I shall cite some instances in which the bromide acquires the violet colour, hitherto regarded as peculiar to the chloride, and which would seem to indicate an analogy between these two salts, although it shows at the same time that this violet bromide is even still more unstable than the corresponding chloride.

I hope, Sir, that you will excuse me if I do not send you this memoir immediately. I would say again, that I have too much esteem for yourself and the Journal you so ably represent to write for you and it anything of an inferior character. I desire, above all things, to publish original articles, that is to say in which there is really something new.

I am, Sir, yours, &c., D. VAN MONCKHOVEN.

P.S.—I do not entertain the same view as yourself in reference to Moser's images. My opinion is that, if the glasses had been thoroughly treated with nitric acid, it is not possible that any trace of silver should remain. I do not either believe in the phenomena of "stored-up light," as described by M. Nièpce de St. Victor.

If I desired to advance a hypothesis on this subject, I should be disposed rather to favour the idea of a physical modification of the surface. Hundreds of instances are known in which a physical alteration of a solid surface determines either crystallisation or a more simple combination of certain bodies, &c. But what can be the nature of this modification? As I said in my note before the Academy of Sciences, many observations must be made before we can pretend to any certain knowledge on the subject.

SPOTS AND VARNISH.

To the EDITOR.

SIR,—I am more puzzled with my varnish than with anything else in my photographic practice. When I have succeeded well, to lose the film, or to have it covered with small spots, annoys one exceedingly. Sometimes the film comes off after the second or third impression—oftener after the first—and I have no security for it. I tried to print a positive without varnish, but the prints come out with spots. An exaggerated specimen I send of an old lady in her bed, which required a good deal of strengthening; but I had several prints of other subjects slightly spoilt. I use Sœhnée varnish and Rouch's collodion. Is the varnish too thick, or what is the cause?—I am, yours, &c.,

Dunskey, Port Patrick, N. B., AMATEUR.
18*th August*, 1862.

[If your film leaves the plate after it is varnished, the latter must be improperly applied—most probably poured on before the film of collodion is thoroughly dry. A collodion film soon becomes surface dry, but there is much moisture still retained, and this is only to be driven off by the aid of heat or the lapse of considerable time. Your varnish has also probably become too thick to penetrate the film, in which case you had better add about twenty-five per cent. of alcohol to thin it. Of course you warm the plate before applying the varnish, and perform the operation before the fire; the plate should be made at least as hot as the hand can bear. The other defect—that of the spots—almost invariably arises from printing with an unvarnished negative upon paper that is not properly dried after sensitising; and the worst of it is that both the negative and positive usually suffer under such a condition of things, so that after an accident of this nature it is hopeless to expect another proof from the same negative.—ED.]

PANORAMIC PHOTOGRAPHY.

To the EDITOR.

SIR,—In the Leader of your last number, on *Panoramic Photography*, your comments upon Mr. Parry's pictures would lead people to suppose that gentleman to be the originator of the process in question—a claim which I think the author of the paper does not make.

If Mr. Parry has made an improvement in the ordinary camera by which such pictures may be taken in greater perfection, by all means let him have the credit due to him; but I must claim for myself the origin of the idea, the working it out in practice with the usual stereo. camera, as well as the first publication of the plan—which you either have not seen or have forgotten.

You will find it described in a letter to the *Photographic News*, dated March 22, 1862 [1861?], and a copy of the picture sent in illustration of that letter is at your service.

About twelve months after this, Mr. Sidebotham exhibited, at Manchester, a picture taken in the same manner, which was received as something new. Doubt being expressed as to the possibility of uniting two pictures in this manner, and the details of manipulation being imperfectly given, I wrote a private letter to Mr. S., accompanied by one of my specimens, which he kindly exhibited at the following meeting.

From one of these sources Mr. Parry must have procured the suggestion, and added an arrangement having for its object the better or more certain adjustment of the two pictures.

I have not practised the system much, from the difficulty of finding subjects in which the false perspective is not apparent. Judging from your description, Mr. Parry's scenes are well adapted for this mode of working; but I cannot agree with you that "subjects almost totally excluding the sky are consequently very trying to the success of the plan adopted in taking them." In my experience it is in the sky that imperfect union is shown, unless, indeed, the sky prints absolutely white, which is not considered a *desideratum* in artistic photography.—I am, yours, &c., G. S. PENNY.

Cheltenham, August 23*rd*, 1862.

[We remember Mr. Simpson exhibiting a specimen (such as our correspondent describes) at the North London Photographic Association, some months back; but we were under the impression that it was obtained from Mr. Parry.—ED.]

OPTICIANS.

To the EDITOR.

SIR,—Dr. D. Van Monckhoven, in an extract which appeared in your last Journal, says:—"Everybody acknowledges Messrs. Dallmeyer, Morz, Secretan, and Voigtländer as opticians of the first rank in Europe." Although I do not wish to detract from the merits of the opticians named, I think it would have been but an act of justice of the learned doctor to have mentioned an English optician—Mr. Ross—whose reputation, not merely *local* but *European*, stands at least as high as the best of those he names. The passage I have quoted looks very much as if it had received its inspiration from the shop over the way.—I am, yours, &c.,

FAIRPLAY.

[The writer of the preceding encloses his name for our private satisfaction, and we know him to be a perfectly disinterested person, or we should not have admitted the note; he is, however, entirely mistaken both with regard to the *source* and *motive* of the "inspiration." We have no doubt whatever that Mr. Dallmeyer is perfectly innocent of any prompting in the matter, and that the desire to express his appreciation of an English optician's skill emanated *entirely* from Dr. Van Monckhoven's own courtesy. In fact, he had expressed to us, in several private letters, his high estimation of the lenses he had purchased from Mr. Dallmeyer some time before he wrote the article which he subsequently requested us to extract; and in further corroboration, we may, without breach of confidence, state that he had even previously proposed an original article for this Journal on the subject.

We can readily understand that the worthy doctor did not name Mr. Ross nor another English optician simply because he was not practically familiar with their lenses; had he been so, we fancy their names would have had precedence of some foreign ones that were indicated.—ED.]

ARTISTIC BACKGROUNDS.

To the EDITOR.

SIR,—A great pressure of business prevented our replying in your previous numbers to Mr. Wall's "china shop" letter. We trust that the same sense of fairness and justice which procured the insertion of our last letter will also obtain the insertion of this, which, as far as we are concerned, will close this correspondence.

That Mr. Wall is a clever man we are willing to concede, and that he at times "commits an error as regards good taste" is admitted by you in your note at the foot of our last letter.

We do not mean for one moment to assert that our photographic accessories are perfect, or even near it; but we do mean to say that we have been the first to bring these accessories (we do not mean the backgrounds) before the public, and we submit on this ground that we are entitled to some consideration.

There are many difficulties to contend with in perfecting new designs or ideas, and ours form no exception to the general rule. We cannot go into detail with regard to these difficulties, but will content ourselves with saying that they are entirely of a mechanical nature, and that we have already surmounted many of them; in fact, our present are very different from our first efforts. In time we hope to surmount all the difficulties: to this end our best attention and efforts are directed, and we are very sanguine as to the result.

We are happy to say we have received great consideration and encouragement, and we may add praise, from many of the leading photographers, gentlemen of true artistic attainments, who have kindly favoured us in some cases with valuable suggestions, but in no instance with censure.

That our productions so far answer their purpose satisfactorily is proved from the fact of the demand for them, which is so great that we cannot get them ready fast enough, notwithstanding that we have a good staff of *employés;* and that the same gentlemen who have had these "black abominations," as Mr. Wall kindly calls them (although in what other colours Mr. Wall would have them painted we cannot possibly imagine), favour us again and again with orders for the same class of work; and that our business is not confined to amateurs, but the greater part of our connexion is with professional gentlemen, very many of them, as we have said, of high artistic reputation.

Allow us to add that our productions have been praised both by your own (we cannot at the present moment lay our finger on the number) and by other photographic publications, and that we have just received "honourable mention" from the Commissioners of the International Exhibition. These facts speak for themselves, and require no comment.

We cannot but deprecate the taste which has led Mr. Wall into criticising our productions, and we are quite willing to let your readers judge between us on this point. Our premises will always be open to their inspection if they wish to form a judgment on the subject. We do not make these remarks in a hostile, but purely in a defensive, spirit, and we regret that they have been called forth.—We are, yours, &c.,

54, *Great Queen Street, Lincoln's Inn,* J. T. & G. BULL.
August 11th, 1862.

[We must, with this communication, close the discussion on this subject. We have already pleaded guilty to an error in not having cancelled the expression of an opinion which we know to have been honestly given, and which was only inadmissible under circumstances with which we were imperfectly acquainted. We are convinced that no malice was intended, and are pleased to find that at any rate no injury has been sustained.—Ed.]

"OUR WEAKLY CONTEMPORARY."

To the Editor.

Sir,—It would have been more congenial to the feelings of the writer to have followed the *retiring* example you have always set in these pages whenever the *personal* element has been introduced into controversy, and to have declined the honour of replying to the vituperation of my "friend Simpson;" and had he not added misrepresentation to personality I should have left this dignified "scientific journalist" to flounder in the turbid element he has stirred up, and have remained satisfied with quietly laughing—as I have often done—at his small exhibition of envy and malevolence. I might have commended your forbearance in having declined to insert my letter in your last issue, did I not feel that in so deciding you denied me that justice which you would have accorded even to an opponent; for you must not forget that in the unfounded charge of "imitation" made by the editor of your contemporary *I* am implicated as well as—if not more than—yourself. I therefore submit that I have a moral right to a hearing.

In reply to a remonstrance in this Journal against his propensity for "appropriation" without acknowledgment—an article in which there was not an offensive epithet employed—"friend Simpson," in his number for July 25th, felt it necessary to devote two pages of his small space to an exhibition of his malice, bad taste, and love for personalities. In his long, wordy, and offensive reply, this "fellow-labourer in photographic literature" was not content with simply answering, as best he could, your damaging article on his "cribbing" proclivities, but he thought it consistent with his "own self-respect" to resuscitate the memory of an old dispute about title which had not the most remote bearing on the question at issue, and hence my rejoinder to the uncalled-for allusion to that almost forgotten quarrel.

The recent attack—or rather series of attacks—was a worthy wind-up to our "fellow-labourer's" first *diatribe.* In his number for August 8th, page 373, he enacts a somewhat similar part to that of a well-known transatlantic member of the P. R., in a memorable fight described in *The Times,* who, when his eyes were closed up as the result of the heavy punishment they had received, "let out," right and left, on friend and foe indiscriminately. Our contemporary, smarting under *his* punishment, blindly attacks all connected with this Journal; and after his short but characteristic assault disappears—only to re-appear at page 383, where he again expends more of his wrath in a small-minded attack on a gentleman of scientific attainments, who had written to protest against the unwarrantable use made of private correspondence. But at page 384 "friend Simpson" again appears in a multiple character. In the first column of that page, devoted "To Correspondents," his strategetic talents are called into play. Here I have to fight a "triangular duel" with "Old Photo.," *alias* "Fairplay," *alias* "F. M. S.;" but whose more correct *alias* should be added, viz., the editor of "our weakly contemporary."

Firstly, I shall deal with my friend's primary *alias*.—"Old Photo." ("Old Muff" would have been more appropriate) charges this Journal with "imitating" the *News* in "almost" every feature! Well, "wonders will never stop ceasing!" as his friend, the "traditional Irishman," would say. The *News* came out as a quarto, and The British followed suit! I presume if I state that the Editor and myself had a little friendly controversy on the subject of enlargement of size *before* the *News* started into existence, my polite friend will say it is a mere "assertion or mis-assertion." However, such was the fact; and this enlargement took place in consequence of the constant pressure on both the literary and advertising portions of our columns, and not in consequence of "our weakly contemporary's" appearance in a quarto form. We had before us, for many years, the *Athenæum*—the size of which publication, by-the-bye, we followed, and not that of the *News*—but of course it *must* have been the latter we "imitated."

Again: The *News* commenced a series of articles on "Colouring Photographs," and was followed by this Journal with a similar series. I must leave it to our old and valued contributor, Mr. Wall, to defend himself against the exhibition of "sincerest flattery" involved in his offering for acceptance, to the Editor of this Journal, a series of important articles written with the intention of subsequent publication in a collected form, and which the publisher and *one* of the proprietors of the *News* has since published in a neat volume.

Again: "The *News* issued a series of articles entitled the 'Amateur Mechanic,'" and we followed with "Photographers their own Artificers." Here again I must refer my friend to Mr. Gulliver, of Swansea—the volunteer contributor of the few desultory articles which have appeared under that head—as to whether he "imitated" our contemporary or not. Mr. Gulliver—who is a gentleman of mechanical ability—has forwarded his articles without solicitation; and therefore, I presume, "friend Simpson" and Mr. Gulliver may be left to settle that question of "imitation."

Again: "The *News* commenced a series of articles, entitled the 'Dictionary of Photography,'" and we followed with the "Photographic Glossary." Who do our readers suppose we—or rather the *News*—"imitated" in this particular? Why—*ourselves.* Throughout the first volume of this Journal (1854), there runs a "Photographic Glossary," which, owing to the removal of the author, was left unfinished. We have, therefore, in following out and enlarging *our own* ideas "flattered" our contemporary by imitating him!

Again: "The *News* originated a column of gossiping fragments, as 'Talk in the Studio,'" and straightway we became "inundated" with "Scraps and Fragments," "Olla Podrida," "Entremets," &c. Truly, "Talk in the Studio" must have been a very prolific mamma! While *Mrs.* "*Talk in the Studio*" herself became *attenuated,* her offspring became numerous, and were *so* like the "old lady!" Now, in order of time, the *second* baby (euphoniously called "Olla Podrida") made his appearance *first!* And here, again, who did we "imitate?" Why—*ourselves,* to be sure! Mr. Highley, the editor of The British Journal Almanac, introduced into that little volume, under this head, a number of useful scraps bearing on photography. After the publication of that little *brochure* Mr. Highley, who was then sub-editor of this Journal, proposed to continue a column in the Journal under the same title. When, afterwards, from circumstances, Mr. Highley retired from the post of sub-editor, baby the second—"Scraps and Fragments"—came into existence, and is still healthy and *growing.* But surely my "friend Simpson" does not claim the paternity of baby the third!—the merry, rollicking "Entremets." Our contemporary belongs to the "*serious* family"—*so* mild, *so* dignified, but, alas!——*so* vain! If he claim this healthy, laughing youngster as his offspring—the latter is *very* unlike his parent, that is all I can say!

But, once more, and lastly: The *News* commenced a series of articles on "Photographic Chemicals," and this we followed by "Notes on Photographic Chemicals." What will Mr. Martin, the author, say to this charge of "imitation?" I fancy his good-humoured smile when he read that scrap of nonsense. Mr. Martin had, as you are aware, collected the *materiel* for this important series long before the birth of *Mrs. News,* and, without reference to that "lady," *offered* the MS. to the Editor of this Journal sometime since. I, therefore, refer "Old Photo." to the author.

Thus have I "destroyed the web of sophistry" so ingeniously, but so *softly,* woven on the subject of "imitation" by "friend Simpson." Perhaps I might be allowed gently to hint that *Mrs. News* herself has attempted something in the imitative style. "Photographic Notes and Queries" are immensely original in a double sense. Again: when our series of articles on "Photographic Apparatus" had been "commenced"

and finished for the time being, our *original* contemporary commenced a similar series, under the modest title of "Apparatus." We announced, in our last number, a series of articles to appear on the "Photographic Apparatus in the International Exhibition." In the following number (that for August 15) the *News* came out with one on the "Apparatus" at the Exhibition. Of course, we shall again, by imitating *ourselves*, be offering the "sincerest flattery" to the "weakly one."

In the second of his replies "To [sham] Correspondents," under the *nom-de-plume* of "Fair Play," our contemporary attacks the good-humoured and pointed sarcasm in the communication of our "Funny Contributor"—a "fellow of infinite jest"—such an one as Goldsmith has pictured in a couplet as a

> "Rare compound of oddity, frolic, and fun,
> Who relished a joke, and rejoic'd in a pun."

My friend's mental organs of vision must have been still suffering most severely from his late "punishment," when he so seriously attributed that bit of sarcastic fun to your own "fine Roman hand!" (I wish he knew what a scrawl it is) and "elephantine playfulness!" He must surely be like the Dublin cabman's "poetic horse," that went "faster in imagination than in reality." I almost envy you the merry laugh that followed your perusal of that bit of editorial foolery.

No. 3 of my friend's fictitious replies—that addressed to "F. M. S."—is aimed at myself. I am glad to think that our contemporary is not likely to test the reality of the "mere fudge" of the Act 5 and 6 Victoria, cap. 45, which relates to periodical literature and not to newspapers.

In his number for August 22nd my friend once more plays with his paper *marionettes*, and in his favourite column. Here he again displays his usual small tactics in replying to an imaginary correspondent for the purpose of falsifying facts. "Lex Talionis" is the little figure now brought on the stage, said *little figure* being, no doubt, our contemporary himself, who has a peculiar *penchant* for the "says-I-to-myself" style of controversy. He is still evidently ill at ease about the charge of appropriation without acknowledgment; for, after an interval of a fortnight, he gratuitously assumes that this Journal has done likewise, and asserts that a detail of our "blunders or shortcomings would not interest" his "readers." He adds:—

> "The article in question did not originally appear in *Cosmos*, it is erroneously quoted from that journal by our contemporary. Appearing in two or three French journals without any acknowledgement of its original source, in the uncertainty thus created we simply accredited the author, not knowing to which journal it really belonged. Our contemporary, probably only seeing it in one credited that one, and made a blunder, as the article originally appeared, we have since ascertained, in *Les Comptes Rendus*. In a letter from the writer referred to, we learn that he had alluded to the matter for entirely another purpose, in no sense as a complaint, and that he regretted the misuse made of his incidental remark."

When "friend Simpson" or "any other man" trifles with the "logic of facts," floundering must ensue. I have no doubt that "blundering or shortcomings," at any rate, do *not* include crediting the article of Dr. Monckhoven to *Cosmos*.* Notice the admission above, that he *subsequently* ascertained it to have appeared in the *Comptes Rendus*. It is to be presumed *he knew from which journal he copied it*. Again: Mark the accuracy of the last clause in the tissue of nonsense with which poor "Lex Talionis" is treated as above. If the writer refers again to the article in this Journal to which allusion is made, he will find at page 265, first line, the words, "We have a communication *drawing our attention* to the fact," &c. There is no mention of Dr. Monckhoven having made a "complaint." Then, where is the "misuse" of the "incidental remark?" As, however, the contents of Dr. Monckhoven's reply to my friend's prying note to that gentleman is given *in the third person*, it is just possible that the inaccuracy is to be placed to the account of the editor of the *News*, and not to that of Dr. Monckhoven. Truly is it said that *some people* should have "long memories."

In conclusion.—An apology is due to your readers—and I hereby tender it—for again occupying so much space in reply to the editor of the *News*. I confess that to notice the silly personal nonsense that "my friend" occasionally writes is unnecessary. Whenever he remains satisfied with spirting offensive epithets at the Editor of, and others connected with, THE BRITISH JOURNAL OF PHOTOGRAPHY, his paper pellets, which fall harmless, shall remain unnoticed. But whenever he foolishly fulminates what is untrue in connexion with a Journal that was in existence long before this "Photographic Teacher" began to study "What to Do, and How to Do it," and which it has been my aim, for nearly nine years, to make useful to the ever-increasing number of its readers and to the art-science to which it is devoted, he shall certainly "hear of it again." If, therefore, he refrain from misrepresentation, I wish him "a long farewell." As an antidote to his excessive vanity I recommend him to go back mentally a few years, and, by recalling to mind the teachings of his youthful literature, to avoid the melancholy fate of the frog in the fable. I hope that "friend Simpson" will learn wisdom, as well as study literary honesty, and thus, in the future, he may also "achieve greatness" as the editor of what he has himself laboured to make known as—"our weakly contemporary."—I am, yours, &c.,

THE PUBLISHER.

* It appeared in that publication simultaneously with the *Comptes Rendus*, doubtless because the Abbé Moigno, being a member of the *Academie des Sciences*, heard it read and obtained a copy before it was published. When it was copied into the *News* it had not appeared in any other of the French journals. We accredited it to *Cosmos* simply because we translated it from that paper; and we have not hitherto detected the editor misappropriating articles without authority, according to the practice of the editor of the *News*.—ED.

ANSWERS TO CORRESPONDENTS.

RED GOLD.—Add one drop of hydrochloric acid.

R. E. C.—Omit the alcohol in the developer: it is that which causes the mischief in your case.

W. SAVAGE—One ounce of crystals of hyposulphite of soda to five or, at most, six ounces of water.

B. S. (Belper.)—1. A port wine colour is correct. 2. Both are good; but we prefer the first-named of the two.

PHOTO.—We cannot assist you in disposing of negatives: we have nothing to do with photography as a business.

A SUBSCRIBER.—R. P. C.—Your several letters have been forwarded to the respective contributors as requested.

OLD HYPO.—Declined with thanks. It is quite useless setting up a "bogie" again only to prove his non-existence.

W. S.—M. Joubert's address is 35, Porchester Terrace, Bayswater. We have forwarded your letter to him as requested.

A MEMBER OF THE NORTH LONDON PHOTOGRAPHIC ASSOCIATION.—The next meeting will be held on the 17th instant.

THEODORE.—We will inform the gentleman of your desire, and, should he respond, communicate with you through the Journal.

L. M. C.—Chloride of sodium and hydrochlorate of soda are two forms of nomenclature for the same substance, viz., common salt.

RUDOLPH.—We have no cause to doubt the genuineness of the experiment described, though we admit that it scarcely accords with former experience.

VERDANT GREEN.—Reduce the quantity of phosphate of soda by two-thirds. The paper exerts much influence on the result. Most probably your paper is not sufficiently salted: try it with more.

T. P. Z.—To three parts of plain collodion add one part of the following solution:—Bromide of ammonium four grains; iodide of ammonium nine grains; iodide of cadmium nine grains; alcohol, S.G., ·816, one ounce. Let your bath be slightly acidified with *nitric* acid. Fix with hyposulphite of soda.

MEASLES.—It is not sulphur, as you can readily prove by immersing the print in bisulphide of carbon, which is a solvent of sulphur. Mr. Dawson has proved it to be sulphide of silver in combination with organic matters, probably the size.

J. H. S.—There should be no precipitate of bromide of potassium from the formula you propose; but we should advise the bromide of cadmium in preference. See notice of Mr. Ponting's book and short extract in the present number.

AMATEUR.—We have so frequently given the details for recovering silver from waste solutions that we must refer you to some of our back numbers, especially to an excellent article on the subject by Mr. Corey, pages 266 and 267 of the current volume; also to Mr. Hardwich's *Manual*, sixth edition, page 540. The error you notice was simply a typical one of the compositor's, and, as you say, of no consequence.

P. W. S.—We cannot answer for your carbonate of silver being suitable for a positive bath when converted into the nitrate. It may do, and it certainly will, for a negative bath. To utilise it, dilute largely some nitric acid with distilled water, and add the carbonate of silver until no more will dissolve, then add a few more drops of the dilute acid to make the bath slightly acid. Four grains of carbonate of silver will produce about five grains of the nitrate.

C. N.—If you wish to take *carte de visite* portraits, you had better procure a lens specially constructed for the purpose, rather than a short-focus quick-acting one such as you describe. The ordinary portrait lenses of the best quality are calculated rather for sitting than for standing figures. The sketch of a greenhouse which you enclose indicates that it would do for a photographic room; but we should not advise you to erect one like it on purpose. We cannot recommend any one to construct a glass-room for you; but we noticed, the other day, a very good one in course of erection a little to the north of the Great Northern Railway, in the Holloway Road (which we perceive by your address is accessible to you), and on the east side of the way. Doubtless you can ascertain the address of the sash-maker who is building it.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 174, Vol. IX.—SEPTEMBER 15, 1862.

Purification of Water for Photographic Use.—Our attention has been called to certain chemicals capable of application to the purpose of rendering water, contaminated with organic and other impurities, fit for use in most of the operations of the photographer. To those of our readers located in remote districts, where it is no easy task to obtain distilled water, the knowledge of the means whereby they may render almost any kind of water within reach available will be no inconsiderable boon. This desirable result is to be brought about by the judicious use of one or other of Condy's disinfecting and deodorising fluids, consisting of the manganates and permanganates of potash, soda, lime, &c.,—which substances have been long used in various chemical operations, being chiefly useful for their powerful oxidating qualities. A small pamphlet *On the Purification of Water by Means of the Alkaline Permanganates*,* by Henry Bollman Condy, has recently been published; and, after having carefully perused it, we are of opinion that—although written with a view to demonstrate the practicability of economically purifying water for drinking and culinary purposes—water purified by means of the re-agents employed will be equally applicable for photographic use,—an impression diametrically opposed to what we might have anticipated at the first casual glance at the subject.

Few photographers, having any pretensions to a knowledge of the principles upon which their labours are conducted, would entertain any doubt about the injurious effects likely to arise from the presence of organic matter in the water employed in almost any of their operations, while in some of them it would be fatal to success—as, for instance, its presence in large quantity in the nitrate of silver bath; but when we reflect that nitric acid is a powerful oxidating agent, and that the presence of this substance in conjunction with large quantities of organic matter in solution does not remedy the defect nor remove the organic matter from the solution, we are inclined to question the applicability of an oxidating agent for removing dissolved organic matter. But if we look at the subject a little more carefully, we shall perceive that the conditions are not the same under the influence of the alkaline permanganates as they are with the nitric acid; for, although oxidised organic matter is soluble in excess of nitric acid (hence its injurious influence in the nitrate of silver bath), it is not so in pure water, but becomes insoluble, and is consequently precipitated and may be filtered out. That this is so our own experience proves; and, though the experiment we shall detail was performed many years before our attention was devoted to photography and with reference to quite a different object, it is so corroborative of the views advanced that it may be appropriately given here.

It is well known to microscopists that guano, especially that which comes from Ichaboe and from Callao, contains a certain small per-centage of the microscopic organic remains of the *Diatomaceæ*—being, in fact, the siliceous cuticle of various forms belonging to this natural order of minute plants—and as these forms are usually adorned with elaborate and elegant markings, not unlike engine turning, they are sought as interesting objects for examination under the microscope. We may remark, so minute are most of the diatomaceous bodies that, singly, they are quite invisible to the unassisted eye, and that the only chance of isolating them is to find some solvent for the organic matter in which they are found that is inoperative upon the silex of which they are composed. Such a solvent is nitric acid, which acts by first oxidating the organic matter and then dissolving it. Now, the great object of the microscopist is to keep in solution that which has been dissolved, and here his difficulty first commences; for it is manifest that the *Diatoms* are of no use to him while suspended in nitric acid, and in order to get rid of this fluid the natural course of proceeding is to wash it away with distilled water; but, on attempting to do so, as soon as the dilution reaches a certain point a precipitate of flocculent matter is formed (of course a portion of the oxidated organic matter), which entirely mars his object of isolating the *Diatoms*. This annoying deposit was subsequently avoided by the ingenuity of our friend, Mr. Henry Deane, who suggested several preliminary washings with fresh nitric acid, pouring off each portion as closely as possible before the next addition; but without adopting this course the organic deposit was invariably formed. We think this fact corroborative of the assertion that, in order to eliminate organic matter from solution in water, oxidation to cause precipitation thereof is the remedy to apply, while the inutility of nitric acid as the oxidating agent for this purpose is sufficiently explained.

The following short extracts from Mr. Condy's pamphlet will supply the several links in the chain of reasoning:—

"But the action of the permanganates is not limited merely to the testing of water for organic impurities; the properties possessed by those substances, of rapidly decomposing organic matter, and making manifest to the eye their effects, render them admirably suited to the *purification of water* employed for drinking, cooking, and general domestic purposes. Composed of oxygen in combination with manganese, the mildest and most wholesome of the metals, and one or other of the alkalies, the alkaline permanganates can hardly be supposed capable of proving injurious even when, from haste or carelessness, a trace of them in solution or a minute portion of binoxide of manganese in suspension may remain in the water treated. Indeed, it is extremely probable that manganese is a requisite constituent of the human frame, and that its entire absence is not conducive to health. The nature of the re-action which takes place between those compounds and organic matter is, moreover, such, that when they are used with caution, and not in excess, the whole of the metallic ingredient present is separated by precipitation in the solid form, leaving in the water only the alkali which had been in combination with it. As most waters, by reason of a certain portion of carbonic acid which they contain, hold in solution, in the form of bicarbonate, a small quantity of carbonate of lime, the presence of this free alkali is rather an advantage than the contrary, since by neutralising the excess of carbonic acid it converts the more soluble bicarbonate into a less soluble carbonate, which then subsides as a deposit, leaving an alkaline carbonate in its place.

"In certain special cases where the presence of alkaline matter might be objectionable, permanganate of lime may, with much advantage, be employed instead of the true alkaline permanganates. When this is the case the oxide of calcium, which constitutes its base, is converted into carbonate by union with the carbonic acid held in solution by the water, and is precipitated along with binoxide of manganese and sulphur. There

* John W. Davies, 54, Princes Street, Leicester Square.

then remains a fluid of very remarkable purity, which, so far as organic matters are concerned, surpasses even ordinary distilled water, which is seldom entirely free from impurities of an organic nature. Nor is this all, for the oxidising properties which enable the permanganates to consume organic impurities give them the power of removing from water, when held in solution by it, those metals which are susceptible of being converted into peroxides.

"The permanganic acid of one equivalent of permanganate of lime converts three equivalents of protoxide of lead into peroxide, and resolves itself into two equivalents of binoxide of manganese, all of which, from being in a state of solution, become insoluble, and are precipitated. Water can thus be readily and completely freed from lead, which is the most poisonous of ordinary metallic contaminations, and by reactions of a similar nature from all metals capable of assuming the form of peroxides.

"It is evident that by the same means water containing ferruginous impurities may be purified so as to render it fit for use in dyeing and other industrial and economic processes. The avidity which iron exhibits for oxygen makes this re-action absolutely certain. The same thing holds with regard to copper, which, though rarely met with as an impurity in water, is not less injurious in its effects than lead.

"Nothing proves so distinctly the superiority of those substances for purifying water as the certain and delicate way in which they discover the imperfections of all other methods of purification, whereas no substance that I am acquainted with is capable of revealing the presence of organic matter after their use as purifiers. The permanganates, then, not only afford a ready and efficacious means of doing what charcoal is supposed, in a tedious and imperfect manner, to perform, but likewise of producing changes similar to those effected by most of the other modes of purification which are usually recommended or occasionally practised. Thus they do all that alum, caustic, alkalies, alkaline carbonates, and caustic lime are capable of accomplishing; while they even surpass ebullition and distillation in their power of removing organic matter, at the same time that, by the formation and precipitation of oxide of manganese which take place at all points of the water during their contact with substances of an organic origin, they have the effect of mechanically drawing down impurities held in suspension. Add to this, that water purified by the permanganates is, in most instances, pure enough for every ordinary purpose, and so charged with oxygen as to be highly agreeable to the palate, and beneficial to digestion. When absolutely pure water is required for some special scientific object, it can be readily procured with one distillation by the use of an alkaline permanganate.

"To Test Water for Organic Impurities.—Take any number of tumblers; fill up one with distilled water, another with ordinary drinking water from a pump, rain water butt, or other supply, and the rest with various samples of water more or less contaminated with organic impurities, such as sewage water. Add to each of them, drop by drop, Condy's Fluid (crimson) till the contents begin to assume a decidedly pink hue. This effect will be produced, in the case of the distilled water, if pure, by a single drop: more will be required by the drinking water, which, after standing a little while, will show some signs of muddiness; and a still larger portion by the other samples, in which a brown precipitate will soon form. The quantity of fluid required and the amount of muddiness produced in each will be the measure of the relative impurities of the several waters.

"To Purify Water on a Practical Scale.—Pour into a hogshead of offensive drinking water one wine-glassful of Condy's Fluid, and mix with a stick or lath. Generally this quantity will render it as sweet as fresh water: should it require more, add half a wine-glassful. So long as organic matter remains—which is known by the pink colour of the fluid gradually vanishing—add the fluid. If a trace too much has been used, continue stirring, or immerse a stick or lath, and the colour will disappear. Let it stand, and any suspended matter present will subside or filter."

Aërial Photography.—Immediately after Mr. Glaisher's first balloon ascent for the purposes of metereological observations, we suggested to him the idea of attempting, on another occasion, to take a photograph of the scene below, described by him as being grand, impressive, and beautiful; and, in return, he immediately sent an invitation to the Editor of this Journal (whose aspirations, however, were not quite so elevated as to induce him to accept it) to accompany him on his recent voyage, alleging that his own time was so fully occupied while in the higher regions, in attending to the various instruments under his charge, that he could scarcely find leisure to allow him to add photographical operations to his other duties, but at the same time promised to do his best to expose a plate if one were arranged ready for him in a camera. In order that proper effect should be given to this last suggestion it would have been needful to have constructed a camera specially for the purpose, with an arrangement for instantaneous exposure, as the rapidity of movement, as well as its rotating character, would preclude any other method of operating being successful. There was no time to construct the needful apparatus. However, an ordinary camera, furnished with Dr. Hill Norris's sensitive dry plates was taken up; but, from the cause foreseen, it could not be successfully applied, as the following from Mr. Glaisher's own account in *The Times* will show:—

"On the earth at 1h. 3m. the temperature of the air was 59°; at 1h. 13m., at the height of a mile, it was 39°; and shortly afterwards we entered a cloud, which was about 1,100 feet in thickness, in which the the temperature of the air fell to 36½°, and the wet-bulb thermometer read the same, showing the air here was saturated with moisture. On emerging from the cloud at 1h. 17m. we came into a flood of light, with a beautiful blue sky without a cloud above us, and a magnificent sea of cloud below, its surface being varied with endless hills, hillocks, mountain chains, and many snow-white masses rising from it. I here tried to take a view with the camera, but we were rising too rapidly and revolving too rapidly for me to do so; the flood of light, however, was so great that all I should have needed would have been a momentary exposure, as Dr. Hill Norris had kindly furnished me with extremely sensitive dry plates for the purpose."

ON THE NATURE OF THE PHOTOGRAPHIC IMAGE.*

By George Dawson, M.A.,

Lecturer on Photography at King's College, London.

I now precipitated all the nitrate of silver in A and C with an excess of chloride of sodium (B already had an excess), and subjected it to the following treatment:—

The three precipitates, after separation from the solutions, were carefully washed in many waters. They were then digested for two hours in slightly diluted nitric acid, free from impurity, at a temperature not over 212°. The resulting action was so imperceptible to the eye that I imagined none had taken place. In my anxiety to determine this I poured a few drops of dilute solution of chloride of sodium into A, when a decided but not very copious precipitate of chloride of silver fell. In B it was much less marked, but still perceptible and considerably more abundant in C than in either of the other two—that is to say, in C, containing throughout an excess of nitrate of silver and organic matter, more metallic silver had been reduced by the force of actinism than in A, which contained no organic matter; and still more than in B, which only contained chloride of silver. It had been my intention to determine quantitatively the exact weight (if any) of fresh chloride thus obtainable from each, and thence to calculate the weight of silver reduced, and I had prepared a standard solution in a pipette graduated to the 960th part of a grain. In my anxious haste all this was forgotten. But, even had I ascertained the fact, the knowledge could scarcely be of any practical value except as an illustration of the comparative difficulty with which metallic silver is reduced under the different conditions mentioned.

The remains of the original precipitates (still black) being now carefully separated from the nitric acid and well washed, were thrown into three saturated solutions of hyposulphite of soda, and stirred about occasionally for upwards of an hour. Extremely little, apparently, was dissolved. Again washed, they were treated with the strongest liquor ammoniæ for the same time without any being dissolved. Yet, after the application of all these solvents, their bulk, colour, and general appearance were nearly the same as before their treatment with nitric acid. C had lost considerably in bronzing, and perhaps A was not so intensely black as before.

The impression left on my mind from carefully watching the foregoing experiments is a strong conviction that the ultimate effect of a chemical ray acting on chloride of silver is the reduction of the latter into metallic silver by the liberation of all the chlorine. According to close observation the very first particles of chlorine liberated induces a visible change of colour in the mass, the coloured portion being some sort of subchloride, perhaps, of no definite composition. We see the colour deepen as the chlorine is removed, but still without any trace of metallic silver; and experiment shows that an immense accumulation of actinism is required to dissipate the last traces from a particle, or aggregation of particles, so that it may be soluble in nitric acid—if that may be considered a test of complete decomposition.

It may be questioned how far this notion is consistent with the atomic theory upon which all our ideas of chemical composition and decomposition are founded. It may be urged, for instance, that a compound atom of silver and chlorine Ag Cl, if acted on by light at all, cannot have *less* than one particle of chlorine taken away, which must necessarily leave the atom Ag free to combine with any element for which it had an affinity, or with nitric or any

* Concluded from page 325.

other acid strong enough to convert it into a base, and effect combination. This undoubtedly would be true when we are dealing with a compound isolated atom. But that such is not the immediate effect of light on a mass is very evident from the fact that chloride of silver blackens readily under nitric acid, after a short exposure in the sun, and when removed into the dark remains discoloured for any length of time, the surrounding nitric acid at the same time not indicating by the most delicate test the slightest trace of nitrate of silver. The Ag therefore is not free to combine with the nitric acid, although chlorine can be proved to have been removed, but must be held prisoner by some more powerful agent.

I may here venture a probable explanation, forced on my notice from a patient, unprejudiced attention to the phenomena presented, and which is not by any means inconsistent with the theory of atoms, viewed in its strictest sense. Let us suppose a single compound atom of Ag Cl subjected to the chemical ray. The first impulse would necessarily remove the chlorine, and leave also the Ag free. In other words, if it were possible to submit at the same time a multitude of isolated compound atoms of Ag Cl to the influence of sufficient actinism, complete separation would instantaneously ensue. But as we can in our most finely-divided precipitates only throw down an aggregation of atoms—each aggregation invisible to and inappreciable by the senses, and possibly by the finest instruments—we may have an atom Cl set free from its Ag; but the latter being in contact with, or in chemical proximity to, other compound atoms of Ag Cl, may be detained by them, and forced into a new combination. All the facts with which we are familiar, and the appearances that present themselves, furnish a strong presumption that the Cl has the power of combining with many atoms of Ag, forming a series of sub-chlorides; thus Ag, Cl, Ag_2 Cl, Ag_3 Cl, Ag_4 Cl, and so forth, until the final detaining atom of Cl in the aggregation is dissipated by the force of actinism. With what great difficulty this last "break-back feather" is imposed we may readily learn from the fact of the blacks of our deepest prints giving no evidence by the most sensitive tests of the presence of metallic silver, and from my own observation of the barely perceptible manifestation of silver from finely-divided chloride (with chloride of sodium in excess), after an exposure of three months to sunshine.

Contemporaneous with the foregoing experiments, and to some extent confirmatory thereof, another series was conducted as under:—

From a mass of dried chloride of silver three small parallelopipeds were smoothly cut and placed in separate small transparent bottles—two being filled with dilute pure nitric acid, and the other with distilled water. The latter and one of the former were exposed undisturbed for three months in the sunshine on the same ledge as the large bottles in the previously detailed experiment; the other was locked up in a dark cupboard for the same period. The mass of chloride in both of those exposed to sunshine immediately commenced to blacken; but, after two or three weeks, the one covered with nitric acid showed symptoms of slight disintegration, and long before the expiration of the three months the bottom of the bottle and the surface of the block of chloride were covered with an extremely fine black powder. The one covered with water bronzed completely, but throughout preserved its original smooth surface; while the one in nitric acid, in the dark, remained in every respect unchanged.

I conclude from these latter experiments that the action of light on chloride of silver under nitric acid does finally reduce some portion of it to the metallic state, which, being dissolved by the nitric acid, is again precipitated by the liberated chlorine; and thus the action would go on interminably. On no other principle can I account for the disintegration of the chloride and the formation of the fine black powder in the one case, which were both absent in the other two.

What, then, are we to say is the composition of the photographic image? If by "photographic image" we only mean the picture formed on a sheet of paper containing chloride and nitrate of silver, exposed under a negative for the ordinary time to the action of light, I should pronounce it to be a sub-chloride of silver of no definite composition, having less chlorine in proportion to the depth of the blackening. Doubtless, if the action of light were continued indefinitely, some metallic silver would eventually be formed; but this precludes the idea of any photographic image at all, and I cannot find a particle of evidence to show that the first point of complete decomposition occurs till after a protracted action under circumstances much more favourable than an immobile surface of chloride of silver on paper can possibly be.

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.*

By Emerson J. Reynolds.

GENERAL RE-AGENTS.

Our introductory remarks being concluded, we now arrive at that portion of our subject in which it is necessary to treat of the deportment of the several basic groups with "general re-agents." Before doing so, it may be better to devote a little space to the consideration—first, of the preparation of (when necessary), and secondly, of the detection of impurities in, the class re-agents.

These general tests are four in number, viz.:—*Hydrochloric acid, sulphuretted hydrogen, sulphide of ammonium*, and *carbonate of ammonia*. In actual analysis these re-agents are applied to the solution under examination in the order above laid down; and in the same order we shall now speak of them more in detail.

Hydrochloric Acid (Muriatic Acid, Spirits of Salts); symbol, H Cl.—This acid, as usually met with in commerce, is seldom pure, being of a straw-colour, indicative of the presence of perchloride of iron: the yellow tint being wanting is, however, no sure indication of the absence of that metal, as it is quite possible to purchase an acid which has been freshly prepared and colourless, yet containing a considerable quantity of iron. As a pure acid can be easily obtained to buy, it is unnecessary to describe the mode of preparation here; but, before admitting a specimen of acid into use in analysis, it ought to stand the following tests:—

1. Place a few drops, together with some water, in a test-tube, and add a little solution of *chloride of barium*. If a white cloud appears, *sulphuric acid* is present.
2. Evaporate a single drop gently on a slip of glass. No solid residue should be left.
3. Boil a little in a test-tube with some water and a bright piece of *copper* wire. If the wire becomes covered with a steel-grey coating, *arsenic* is present.
4. Nearly neutralise some acid with *ammonia*, and add a drop of solution of *yellow prussiate of potash*. If a precipitate of Prussian blue takes place, *iron* is present.

Sulphuretted Hydrogen (Hydrosulphuric Acid, Sulphide of Hydrogen); symbol, H S.—In preparing this gas we require a piece of apparatus, which may be made as follows:—Take a four-ounce phial, and fit it with a very sound cork; then bend a piece of glass tubing in the flame of a spirit lamp, thus—  We then introduce the end *a* into the cork, which has been previously bored, leaving *b* free to dip into whatever solution we wish to pass the gas through. We next have to make some *sulphide of iron*. In order to do this, we must take any rods or bars of iron which we can lay hold of to a neighbouring smithy, and have one of them heated very strongly in the forge. When the temperature is sufficiently high it is taken out of the fire and held over a tub of water, and while there a piece of roll sulphur or cane brimstone is brought in contact with it: immediate combination ensues, and the fused sulphide of iron falling into the water is at once cooled. It should now be collected and dried. When we want to generate some sulphuretted hydrogen, it is only necessary to place a few pieces of the sulphide in the phial; then add about two and a-half ounces of water, and finally a drachm or so of oil of vitriol; considerable and very regular evolution of gas then takes place, which may be easily recognised as sulphuretted hydrogen by its offensive odour, strongly resembling that of rotten eggs. We must caution the student to allow as little as possible of the gas to escape into the apartment in which he may be working, as it often gives rise to headache, sickness, &c., and, above all things, never to let it near his dark room.

Sulphide of Ammonium (Hydrosulphate of Ammonia); NH_4S, HS.—Take one ounce of the strongest "liquid ammonia" of the shops, and pass a current of sulphuretted hydrogen through it, until a drop when added to a solution of sulphate of magnesia (Epsom salts) no longer causes a white precipitate. When this point is reached the stream of gas may be stopped, and the ammoniacal solution being mixed with three ounces of water, it is ready for use.

Carbonate of Ammonia; NH_4O, CO_2.—The ordinary sesquicarbonate of ammonia of the shops, if free from non-volatile matter, is sufficiently pure for use. One part of the salt is dissolved in four of water, and one part of liquid ammonia added constitutes the test solution.

These are all the class re-agents. However, there are two other solutions required which are not actually tests themselves, but

* Continued from page 326.

serve to prepare the way for the group re-agents. It may, therefore, be useful to say a few words respecting them.

Ammonia (NH_4O).—This may be purchased in a sufficiently pure state for analysis. It should not contain non-volatile matter, or sulphates, chlorides, or iron.

For use, dilute one part of the "liquor ammoniæ" of the shops with two of water.

Chloride of Ammonium (Sal-ammoniac); NH_4Cl.—The rough sal-ammoniac should be dissolved in boiling water, using as small a quantity of the latter as possible; the solution should then be placed close to a fire (but protected from dust), so as to induce slow evaporation. After a short time, beautiful plumose crystals will be found to have formed. These must be taken out of the vessel, washed quickly with distilled water, and then one part of the crystals dissolved in eight of water, to form the test solution.

In every case where we speak of water we must be understood to mean distilled water, quite free from extraneous matter. To ascertain this, the following simple tests should be tried:—

1. A drop evaporated on glass should leave no residue.
2. When added to solution of *chloride of barium* no white precipitate should make its appearance, indicating the absence of sulphates or sulphuric acid.
3. Add to a little placed in a test-tube a few drops of solution of *nitrate of silver*. No cloudiness should be produced, proving that chlorine or chlorides are not present.

DISCRIMINATION OF THE BASIC GROUPS.

First Group.—On referring to our list of the members of each group, it will be found that *silver*, *mercury*, and *lead* comprise the first group. Now, supposing we make a solution containing nitrate of silver, sub-nitrate of mercury, and nitrate of lead, and we then add a few drops of *hydrochloric acid*, we at once get a white precipitate, which increases in quantity as more acid is added, until we arrive at a point when no further change is produced. What is this precipitate? It is a mixture of our old friend chloride of silver, calomel (sub-chloride of mercury), and chloride of lead. The two first are quite insoluble in water, and the third nearly so. Therefore, since, under these circumstances, the chlorides of all other metals are soluble, if we add hydrochloric acid to a solution and get no precipitate, we may at once infer the total absence of silver and sub-salts of mercury, and very probably of lead. Hence, owing to this peculiar action of hydrochloric acid, it is called the "general re-agent" for the first group.

Remarks.—It may seem extraordinary to the junior student that both lead and mercury should be members of this group and the next likewise; so we must endeavour to explain the apparent mystery. The chloride of lead formed on adding hydrochloric acid to a solution of a salt of that metal is partially soluble in water; so that if we have but a small quantity of lead present, it will be at once perceived that the acid may fail to cause a precipitate, owing to the presence of sufficient liquid to hold the chloride formed in solution. However, though the lead may not be detected under these circumstances, it cannot escape in the examination for the second group. The reason is quite different in the case of mercury, since there exist two distinct states of oxidation of the metal, each oxide forming salts with acids. There are likewise two chlorides: one, corresponding to the protoxide, is known as the highly-poisonous "corrosive sublimate;" and the second, to the grey oxide, is called "calomel." Now, corrosive sublimate is soluble in water, and calomel is not; so that we are at once in possession of a simple means of separating salts of one oxide from those of the other. Therefore, the mercury detected with the first group must exist in the solution as a salt of the grey or sub-oxide, and that found in the second as a salt of the red or protoxide.

Second Group.—The separation of this class of metallic oxides from all others depends on the fact that the sulphides—or sulphurets as they are sometimes called—of all the metals which constitute the group are totally insoluble in an *acid* solution: we may also subdivide the group into two sections, one being soluble and the second insoluble in sulphide of ammonium. Let us now suppose that we have a solution under examination and we have added hydrochloric acid to it in testing for the first group, we now pass a stream of sulphuretted hydrogen until the liquid, even on shaking, smells strongly of the gas; the solution is now warmed gently, and any precipitate which may have formed is allowed to subside;* the clear supernatant liquid is then poured off, and reserved to be examined for the remaining groups; some water must be then thrown over the precipitate and the whole well stirred up, then allowed to subside, and again decanted; we now pour a little *sulphide of ammonium* over the precipitate and warm the mixture; it should then be thrown on a filter, and hydrochloric acid added in excess to the liquid which passes through. If a coloured* precipitate is produced the test has dissolved a portion of the mixed sulphides. We thus ascertain, in the first instance, whether any member of the group is present or not; and next, if present, of which division it is a member.

The following table shows at a glance the constituents of the group, the colour of the sulphides, and the division to which each belongs:—

Precipitated from acid solution by sulphuretted hydrogen.			
1.	Antimony, *Orange.*	Arsenic, *Yellow.*	†Tin (1), *Black.*	Tin (2), *Yellow.*	Gold, *Black.*	Platinum, *Black.*	Soluble in sulphide of ammonium.
2.	Mercury, *Black.*	Lead, *Black.*	Bismuth, *Black.*	Copper, *Brown.*	Cadmium, *Yellow.*		Insoluble in sulphide of ammonium.

Remarks.—To a beginner, the detection of this class of metallic oxides may appear a matter of considerable difficulty when compared with the simple test for the first group. Such is not really the case, since nothing can be easier than this method of recognising the presence of these bodies. There are, however, at the outset, a few slight difficulties which we shall try and clear away. To begin, then: in commencing an analysis it is always neccessary to test for the first group, which, if present, must be completely thrown down by adding hydrochloric acid until a precipitate ceases to appear: of course a little *lead* remains in solution, but this is discovered in the second division of the group we are at present engaged with. If free *nitric acid* be present the solution must be evaporated nearly to dryness to expel the acid, and then water and a little hydrochloric acid added. Finally, assure yourself by test-papers that the liquid is moderately acid, but not too much so. If these few and simple precautions be attended to, the student may, with a little practice, convince himself of the presence or absence of these two groups of bodies, with very slight expenditure of time and trouble.

If we plunge into a *separate portion* of the solution under examination a brightly-polished blade of iron or steel, and after allowing it to remain for a few minutes in the liquid, we find it coated with a red deposit of *copper*, we must use *sulphide of potassium* for the ammonium compound, in consequence of the sulphide of copper being somewhat soluble in the latter but not in the former. The sulphide of potassium may be made in exactly the same manner as that of ammonium, substituting "liquor potassæ" for "liquor ammoniæ."

Third Group.—The general re-agent for this group is *sulphide of ammonium* employed with an *alkaline* solution. In actual analysis we must have freed the liquid under examination from the first two groups (if present), then a little solution of *chloride of ammonium* is added, and next *ammonia*, until the liquid has an alkaline re-action.‡ We now pour in an excess of *sulphide of ammonium*, and observe whether a precipitate is produced or not: if not, this group is absent.

The constituents of the group when precipitated under the circumstances above mentioned are in three different conditions, viz., as sulphides, as oxides, and as salts. Since the last mentioned compounds are not likely to come much in the way of a photographer, and as they would only complicate matters, we will not notice them further.

This table will give some information regarding the appearances of the members of this class:—

Precipitated by sulphide of ammonium from alkaline solution.			
Iron, Nickel, Cobalt, *Black.*	Zinc, *White.*	Manganese, *Flesh-coloured.*	Uranium, *Brownish-Black.*	As Sulphides.
Aluminum, *White.*	Chromium, *Green.*			As Oxides.
Baryta, strontia, and lime, in combination with phosphoric, oxalic, or boracic acids, or magnesia with phosphoric acids, *White.*				As Salts.

Fourth Group.—The carbonates of the members of this class are all insoluble in water; so that, when we are certain of the absence of the constituents of the first three groups, it is only necessary to

* If *peroxide* of iron exist in the solution a precipitate of *sulphur* will be produced (though none of the members of the second group are present) owing to the power which sulphuretted hydrogen possesses of reducing *per*-salts of iron to the state of *proto*-salts. The same reduction takes place if certain other oxides are present, but of this more will be said hereafter.

* If only a pale yellow precipitate is produced, which fuses into a yellow liquid and finally disappears completely when heated on platinum foil, it is simply *sulphur*, the formation of which is due to the action of the acid on the sulphide.

† Tin (1), if existing as a compound of *protoxide*—(2), if of *peroxide*.

‡ If, after the addition of the ammonia in slight excess, any turbidity appear, it may be disregarded, as the subsequent treatment with the sulphide will set matters right.

add a few drops of solution of *carbonate of ammonia*, and observe whether a white precipitate is produced: if so, it is caused by the presence of *barium*, *strontium*, or *calcium*, all or either.

Fifth Group.—This comprises the following metals:—Magnesium, potassium, sodium, lithium, and ammonium (?). There is no actual precipitant for all these bodies; so that their existence has rather to be inferred from the fact that the solution contains no other metallic oxides, but yet, when evaporated to dryness, leaves a fixed residue, which is not dissipated by strong heat.*

Such are the rules to be adhered to in systematic analysis. Let us now see how they are put in practice. Suppose we take a dilute solution of each of the following salts:—1. Nitrate of silver. 2. Tartar emetic (double tartrate of *antimony* and potash†). 3. Iodide of cadmium. 4. Protosulphate of iron. 5. Chloride of barium. 6. Chloride of sodium. We shall now examine each separately.

1. About half a teaspoonful is placed in a test-tube, and tested with *blue* litmus-paper: no alteration of colour is produced. A slip of reddened litmus, when immersed in the liquid, gives the same negative result; therefore the solution is that of a neutral salt. On adding a drop of hydrochloric acid, a white precipitate is at once produced; more acid is added, and the mixture shaken after each addition until further precipitate ceases to appear; the whole is then thrown on a small filter, and a few drops of the liquid which passes through evaporated gently over the spirit lamp on a slip of glass. No non-volatile matter is left; therefore we need not apply any further tests for other bases. Now, as we obtained a precipitate with hydrochloric acid, the compound examined must be a member of Group 1. To determine which constituent of the group, would require the use of special tests, which we shall refer to more particularly in our next article, our only object at present being the detection of the *group* to which the compound belongs.

2. Solution is neutral to test-papers. Gives no precipitate with hydrochloric acid. A current of sulphuretted hydrogen is now passed to excess through the acidified liquid; an orange-coloured precipitate is produced, which is warmed with the solution, then allowed to subside, and decanted; it is then washed, as before described, with water, and, after pouring off the latter, a little *sulphide of ammonium* is added, and the mixture warmed; the precipitate completely dissolves, indicating the presence of a member of the first division of the second group.

3. Neutral to test-paper. No precipitate with hydrochloric acid. Absent, Group 1. Sulphuretted hydrogen causes a yellow precipitate, *insoluble* in *sulphide of ammonium*, and permanent when heated on platinum foil. This can only be cadmium, as will be seen on referring to the table of the second group.

4. Affords no precipitate with hydrochloric acid or sulphuretted hydrogen. A little *chloride of ammonium* and slight excess of ammonia are now added, and, finally, *sulphide of ammonium:* a *black* precipitate is produced. Present, some member of the third group, certainly one of the black sulphides.

5. No alteration produced by hydrochloric acid, sulphuretted hydrogen, or sulphide of ammonium in alkaline solution, but gives a white precipitate on the addition of *carbonate of ammonia.* Present, some member of the fourth group.

6. Gives no precipitate with any general re-agent; but since, on evaporating a drop of the solution, a solid residue remains, one or other of the constituents of the fifth group must be present.

The student should practise on solutions such as these, until he has acquired facility and experience in the detection of these groups, before he commences to separate the individual constituents of each class.

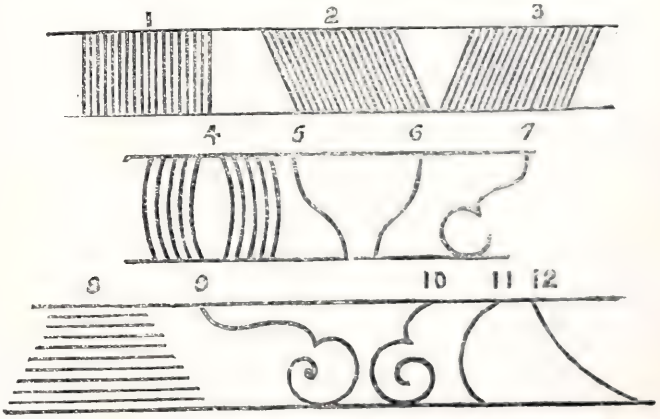
Errata in previous Article.—Page 325, nineteenth line from top of article, for "*youthful*" read "*useful;*" third line from bottom, for "*brass*" read "*glass.*" Page 326, thirty-sixth line from bottom, for "*vinary*" read "*binary;*" twenty-first line from bottom, for "*vinary*" read "*binary.*"

THE PENCIL AND ETCHING NEEDLE.

By an Old Hand.

Every individual in any way connected with art—graphic or philosophic—should be able to use the black lead pencil. Every-one of moderate capacity may make himself in a short time capable of doing so with advantage and often with profit. To the photographer in particular these remarks apply; and many pictures might be preserved and made presentable if the operators had but a little skill and freedom of hand so as to touch up their productions and hide some accidental blemish or defect. This, in a commercial point of view, is of some consequence, and well worth the attention of all engaged in the photographic art. How many positives on glass are refused, from specks, flaws, stains, and other blemishes on and round the plate that no mat will cover. In fact, a good, bright, clear mat makes the defect worse! Then, with landscapes on paper, how many might be preserved that are now rejected, owing to stained white skies, spots, finger-marks, &c.! The attempt to remove or hide any of the above-named defects by those wanting dexterity of hand is just making bad worse; for decision and firmness in the use of the pencil or brush can only be attained by practice, care, and attention. Like many other neglected things it only wants a beginning; and, in a short time, the novice following the directions laid down in this article would fairly surprise himself. The writer does not propose to go in for a "great cram," and make people wonderfully clever in no time; nor does he intend to touch upon high art, nor any of its attributes; but to give plain directions in plain terms, calculated to lead all followers to successful results. The experience of many years as a sketcher and antiquarian draughtsman has fully convinced him that much may be done by a little perseverance; and that photographers may occasionally assist their pictures without knowing anything of or about the manipulations of Vandyke, Reubens, Rembrandt, or Sir Joshua. Let it be understood the use of these resources is only advocated in cases of emergency and necessity. If a photograph be clear, clean, and presentable—either on glass or paper—let it alone; do not attempt to make good better. As, however, photographic proofs are liable to mishaps beyond the control of the most skilful or cautious, it is prudent to have means at hand, and to be competent to apply them in a way that will, in some measure, repair the defects. I shall, therefore, as regards the black-lead, the camel-hair pencil, and the etching point, endeavour, if possible, to condense the experience of a lengthened period in their use into a narrow compass.

Thirty or forty years back a good black-lead pencil was not to be obtained under sixpence, and then the lead was hardly half-way up. The drawing-pencil trade of the period referred to was a great monopoly; but, in these days of free trade and competition, good articles in various degrees of hardness may be obtained for about two shillings the dozen. For general purposes and practice, select a pencil marked "HB." Cut the cedar away for about three-parts of an inch to a fine point. Never cut a pencil short and stubby. Rule a couple of lines on a sheet of cartridge paper, or stitch a few leaves of straw paper together for general practice: rule it through as a copy-book, and then practice the following:—



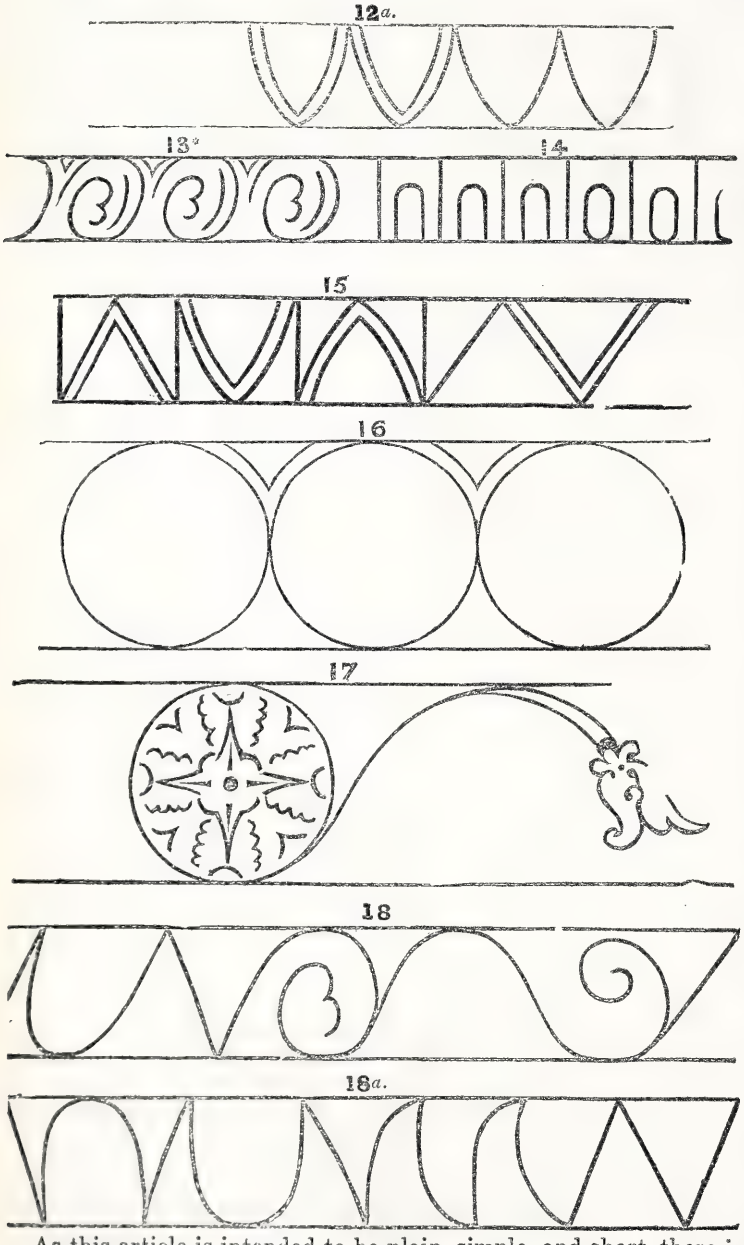
After a few weeks' practice between lines of half-an-inch apart, increase the distance to three-quarters, then to an inch, and finally to one inch and a-half or two inches.

As all drawing consists of upright lines, leaning lines, crooked lines, hollow rounds and curves, judiciously and skilfully mingled, the simplicity of the above examples will often cause the self-sufficient to neglect the practising their formation, and commence some large showy subject, such as a house or landscape. This is commencing at the wrong end—beginning at the roof and ending at the foundation. All such generally waste many years before the hand and wrist get firmness and the eye decision. In following up and carrying out the practice of the first twelve examples there is little difficulty. Most people carry a pencil in the pocket, and there are generally odd pieces of paper lying about: so rule lines, and practice away, going on steadily, from week to week, during any leisure half-hour. At the end of a few months' application, the hand will begin, as it is termed, to feel itself—to have acquired firmness and decision—so that when the mind thinks on a form, the hand catches the idea, as it were, and, guided by the eye, the pencil shapes it on paper.

* Ammonia must be tested for in the original solution.
† We may disregard the potash, and search merely for the antimony.

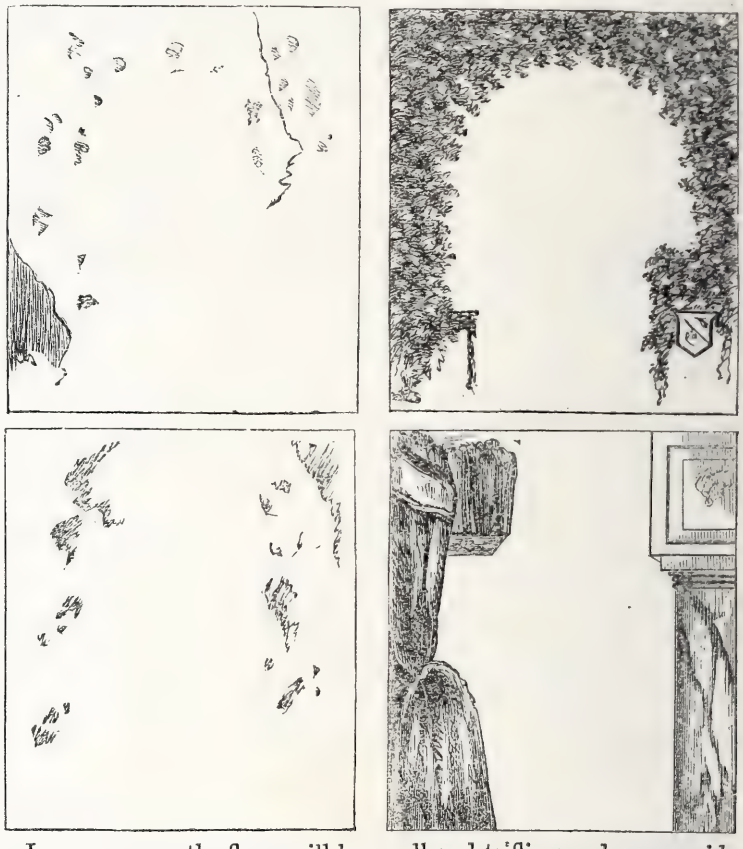
As regards music: does a violin-player begin attempting difficult pieces by Sebastian Bach, or a sonata in D, with variations? Certainly not: if well advised, he begins to learn the notes correctly. So with the examples: a ready use and knowledge of the same is of equal consequence to the student of the pencil as the notes are to a musician.

After having practised the first set of examples for some time, attempt any of the following, sometimes using the narrow lines and then gradually increasing the width, at the same time accustoming the eye to get the various divisions with evenness and accuracy. Attend to No. 13 in particular.



As this article is intended to be plain, simple, and short, there is no need of going further into the science of drawing, or at all trenching on the higher or more difficult branches. All who wish to follow up with the more advanced and difficult portions of the art can consult any of the excellent manuals published by the various dealers in drawing materials.

The etcher's needle, or sharp point, now comes under consideration. A very useful one may be made by sharpening up the end of a small file, so that you have two instruments in one. It will be found of much use in the following way:—Most photographers have taken many positive pictures, unsightly in appearance, owing to specks, flaws, and spots—being quite unpresentable, and certain to be refused by the sitter. Now, though no advocate for backgrounding a portrait at all if it be clear and clean, yet if faulty there, and the face and expression be good, and quite free from any of the injuries enumerated, an expert and practised hand might tint such picture up in oil, or flat colour, and so get out of the difficulty, and hide all blemishes. Now, the less experienced operator had better have recourse to the sharp point, and should proceed thus. Dry the picture well, and holding it firmly in the left hand, over a piece of velvet, or other dark foundation, proceed to etch in, with the point, either traces of ivy or foliage, or pillar and drapery, according to the position of the various specks and flaws. Reference to the illustrations will show, at once, the damaged plate, and the plate repaired and presentable.



In some cases the flaws will be small and trifling and on one side only: in that case a slight etching over and over in imitation of ivy will remedy the defect. The great use of this plan is its quickness. Colouring and painting out in oil or water takes a considerable time—this etching method only a few minutes. The dusty particles should be blown off with the rubber bellows: never on any account blow on a picture with the mouth.

DEVELOPMENT OF THE LATENT IMAGE, OBTAINED IN THE CAMERA OBSCURA.*

By M. D. Van Monckhoven.

It is obvious that, as soon as the proper time has elapsed for exposure, the sensitised plate should be withdrawn from the light, by closing the shutter and carrying it into the dark room. Carefully closing the shutter in front of the yellow glass window, the plate is taken out of the frame. The surface generally presents, on examination, no apparent image; but, as we have said in our introduction, this image can be made apparent by covering the surface, acted upon by the light, with the solution of a salt which reduces the salts of gold and silver to the metallic state. Amongst the substances used for this purpose we shall only enlarge upon the use of pyrogallic acid and sulphate of iron. Among the other reducing agents employed in photography may be mentioned protonitrate of iron, protosulphate of uranium, protosalts of osmium and titanium, and the hydruret of gaïcyle. The capabilities of all these latter salts were tested by M. Monckhoven in the course of the summer of 1860. Of all these salts not in common use we have been most successful with the protosulphate of uranium. Protosulphate of iron is little used, except for direct positives on glass, of which we shall soon have to speak, and almost everyone uses pyrogallic acid. As in a subsequent chapter we give all the necessary details for the use of sulphate of iron, we shall refer the reader to that, premising always that it is only in exceptional cases that he will succeed with salts of iron in developing negatives; and that above all, for a first attempt, the use of pyrogallic acid is far preferable.

* This example is an excellent one for general practice, and should be followed up between broad and narrow lines.

* From *Traité Populaire de Photogr*

We explain the preparation of pyrogallic acid in Note 10, mentioning here only some properties with which the photographer must necessarily be thoroughly acquainted.

Pyrogallic acid is a white crystalline solid, without smell; but in commerce it is generally obtained in an amorphous state—that is to say, not crystallised, and with a pretty decided empyreumatic smell. It is soluble in water, alcohol, and ether, and its solution in either of these menstrua becomes rapidly decomposed on exposure to air and light, especially if the solution be alkaline. This substance alters very soon even when it is dry. If a small amount of moisture be present, however, the decomposition proceeds with increased rapidity, being expedited by the foreign matter which it contains. Thus it is indispensable—first, to keep the pyrogallic bought in shops in small stoppered bottles; second, to keep it in the dark; third, never to prepare with it more developing solution than is likely to suffice for a day's consumption.

It is usual to add to the pyrogallic another acid, as much to preserve the solution as to develop the picture uniformly; distilled water also must be used, or at least rain water, well filtered. That which is obtained during a storm contains ammonia or nitric acid, and is unfit for use.

Solution of pyrogallic acid for developing is thus prepared:—A flask of about 16 ounces capacity is obtained, and made perfectly clean; to this is adapted a funnel, furnished with a filter as in *fig.* 11. Upon this filter throw fifteen grains of pyrogallic acid. Then 12 ounces distilled water being measured off, and half an ounce of crystallisable acetic acid being added thereto, agitating meanwhile with a glass rod, the whole is thrown on to the filter containing the pyrogallic acid, which latter dissolves as the liquid is passing through the filter. The filtration being complete, the funnel is removed and the flask stopped lightly with a cork, and set aside for use *in the dark*.

MM. Davanne and Girard have written a somewhat lengthy paper, with the view of substituting for crystallisable acetic acid another solid and less costly acid. According to these authors the preceding formula may be advantageously replaced by the following:—

Distilled water	300	parts.
Pyrogallic acid	1	„
Citric acid	1	„

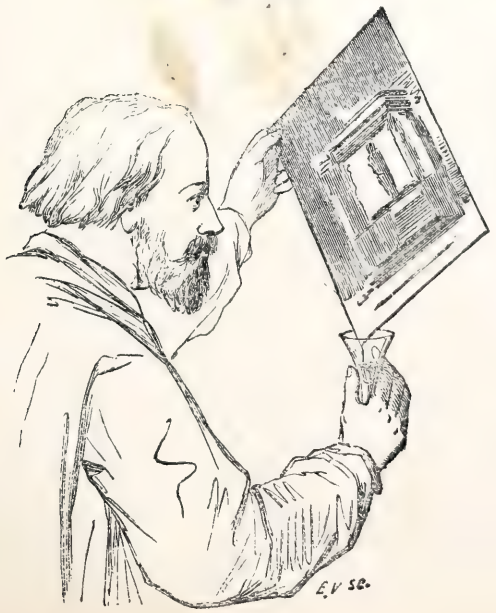
Whichever formula is adopted, the solution being prepared, the following is the method by which we must proceed to develop the image. Let us observe, in passing, that not more than five minutes should elapse between the moment when the plate is sensitised and that in which the picture is developed.

FIG. 58.



The plate, on removal from the frame, is held by one corner (the same by which it was held when the collodion was poured over it); then a small quantity of the developing solution being poured into a glass with a suitable lip provided for that purpose (*fig.* 58), it is poured by a continuous operation on the plate, which is inclined alternately in every direction, in order that the whole collodion surface may be covered without delay. We then suddenly turn the plate upright, holding it by the corner from whence the liquid flowed into the glass.

FIG. 59.



We pour the same solution once more on the plate, inclining it constantly from right to left, in order that the liquid may be kept in continual motion. The image gradually appears, and when it is considered sufficiently developed, the plate is washed by dipping it at first very carefully into a shallow porcelain tray, filled with water; it is then placed under a small stream of water: after which it is fixed. It is desirable, for washing the plate, to use a little apparatus represented in *fig.* 60. It is simply a flask, filled with distilled water. The cork is perforated, so as to admit of the passage of two tubes. The highest—that through which we blow—passes through the cork, and terminates directly under it; the other, on the contrary, rests in the water at the bottom of the bottle. The draughtsman has reversed this arrangement in the figure by mistake.

FIG. 60.
WASH-BOTTLE.



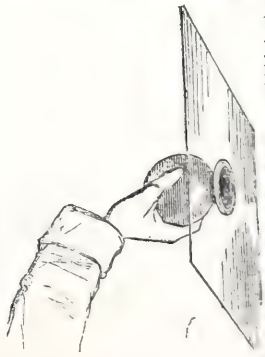
In using this wash-bottle, it is held by the neck while the operator blows through the higher tube, by which means the water is projected through the exit tube, and may be directed over the surface of the film, beginning at the centre and passing gradually to the edges, thus avoiding disruption. *Fig.* 61 shows the operation much better than we can describe it.

FIG. 61.
WASHING THE FILM.



In order to avoid taking the plate in the hand, an India-rubber plate-holder is sometimes employed with advantage. *Fig.* 62 shows a glass plate attached to such a plate-holder. To do this the plate is placed on a level table, and the holder grasped by the globe part in such a way as to force out all the air; the edges are then moistened, in order to make them adhere more perfectly, and the pressure is withdrawn at the moment of bringing the plate-holder in contact with the glass by pressing the edges on it.

FIG. 62.
PNEUMATIC PLATE-HOLDER.



Although the air has been forced out of the bottle, its elastic sides re-assume their shape, and the vacuum left inside causes the plate to adhere very firmly to the plate-holder. To detach it, it is only necessary to compress the bottle as before.

Thus, the operation of developing the picture is described in a few words; but as it is a delicate one, and one on which depends, in great measure, the success of the proof, we feel that it will not be out of place to enter a little more into detail.

The latent image produced by the action of light upon the iodide of silver is brought out by the action of pyrogallic acid, aided by the nitrate of silver, with which the collodion film is impregnated. If too much pyrogallic developing solution is poured from the developing glass on to the plate, the details of the picture appear but slowly, and if too little there will not be enough to cover the plate completely; thus the medium lies between the two extremes.

Sufficient developing solution should be poured into the glass to cover the plate freely and completely, and no more; and this should be poured on and off, and allowed to flow in various directions, in order to facilitate the mixture of the developer with the adherent nitrate of silver. By this method of manipulating it will be found that the development proceeds uniformly, and may be observed from time to time by examining the plate by transmitted light, as indicated in *fig.* 59. When the required amount of intensity is attained, the plate is washed; but, until this point is arrived at, the development is continued according to the preceding directions.

(To be concluded in our next.)

ON THE ADHESIVE MATERIALS EMPLOYED FOR MOUNTING PHOTOGRAPHS.*

By James Martin.

Dextrine—*British Gum, Torrefied Starch*, C_{24}, H_{20}, O_{20}.—This adhesive material occurs in nature in the process of germination, and is there produced by the action of *diastase* on starch. A similar result is also brought about in the process of artificial germination, called "malting." Dextrine is also produced by acting on starch by means of dilute sulphuric or oxalic acids, which have the property of bursting the granules and converting it into the substance in question. When starch is carefully heated to a temperature of 400°, Fahr., it becomes soluble in *cold* as well as in hot water, and loses the power of gelatinising. The solution, when evaporated, yields a translucent hard mass, much resembling some inferior varieties of gum arabic, from which circumstance it has acquired the name of British gum. It is often used as a substitute for gum arabic in calico-printing, and is also the material employed to render postage stamps adhesive. Its value, as a substitute for gum, consists in its being more flexible and less brittle when dry than that substance: it is also less prone to spontaneous change in solution than either starch or *ordinary commercial* gum. Its freedom from saline impurities would also present an additional reason for its adoption by photographers for mounting prints, and this fact will be more fully appreciated by studying the table we shall presently give of the comparative composition of several commercial varieties of gum. The atomic constitution given above will have shown the reader that dextrine and starch are isomeric: it may be distinguished from the latter body, however, by its colour, and its not being rendered blue by iodine, which gives with it a dingy purple tint.

Gum C_{24}, H_{22}, O_{22}, is another proximate constituent of plants, scarcely less universal in its occurrence than starch. In the form of *gum arabic* its ordinary physical appearance will be doubtless very familiar to the reader. It is further characterised by its solubility in cold water, with which it forms a thick mucilage, and is insoluble in alcohol, ether, and oils. Strong nitric acid converts it into oxalic and mucic acids.

For the sake of brevity it has been deemed expedient to tabulate the following facts connected with the six varieties of gum found in commerce:—

VARIETY.	SOURCE.	PROXIMATE CONSTITUENTS.				
		Arabine.	Bassorine.	Cerasine.	Water.	Saline Matter.
1. Gum Arabic ...	Acacia Arabica... Acacia Vera	70·40	——	——	17·60	——
2. Gum Senegal	Acacia Senegal	81·10	——	——	16·10	3·
3. Gum of Cherry-tree and other stone fruits ...	Cerasus Duracina and Vulgaris ...	52·10	——	34·90	12·	1·
4. Gum Tragacanth	Astragulus Tragacantha	53·30	33·30	——	11·0	3·
5. Gum Bassora	——	——	——	——	——	——
6. Gum of Seeds and Roots	*e. g.* Linum Usitatissunum	52·70	28·9 of an insol. matter.	——	10·3	7·11

It is unnecessary to consider in detail any of the above varieties besides the first two, which, from the large proportions of arabine or soluble gum which they contain, are best adapted for use as adhesive materials for mounting photographs, and are in fact in very general use for that purpose among photographers.

The first of these, *gum arabic*, may be regarded as the type of this class of substances, and the tree yielding it grows on the banks of the Nile and in Arabia. The purest commercial kinds are white or slightly yellowish small rounded pieces, generally hollow on one side: it has a smooth conchoidal fracture, and no trace of crystalline structure. It is free from smell, transparent, brittle, easily powdered, and has a specific gravity of 1·335. It is bleached by the action of direct sunlight at the temperature of boiling water, and when moistened with water reddens litmus paper, owing to a trace of supermalate of lime which it contains. Suitable re-agents also demonstrate the presence of traces of chloride of potassium, chloride of calcium, and acetate of potash; and, remembering that the two latter are *highly deliquescent* salts, although the quantity contained is a mere trace (from two to three per cent.), yet it is thought that the propriety of using a substance for mounting photographs which will be always absorbing the moisture of the atmosphere becomes highly questionable, especially when it is remembered what marked effects are produced by the joint action of air and moisture upon the oxides of the nobler metals in the presence of organic matter—all which conditions, it will be remembered, are combined in an ordinary positive proof.

* Concluded from page 305.

Gum Senegal.—The uses and chemical properties of this gum are the same as gum arabic; it occurs in commerce, however, in much larger pieces than gum arabic, some being as large as a partridge's egg, with a hollow centre. It has a specific gravity of 1·436, and is largely used by calico printers. Its proximate constitution is given in the table above.

Gelatine, Glue, Isinglass, Size.—The different substances known by these names possess so many properties in common they may be conveniently considered under one heading, the remarks made under which may for the most part be considered to apply to the whole of them.

Gelatine C_{12}, H_{10}, O_5, N_2 is a substance of animal origin, produced by boiling the skins, bones, horns, hoofs, &c., of animals in water. The liquor thus obtained assumes, on cooling, a semi-liquid tremulous condition, known in commerce as *size*. If, however, it be cut into slices and dried, by suitable means, it becomes hard and brittle from loss of water, acquiring the character of *glue*.

Both these are but rough and comparatively impure forms of the substance in question, which are, nevertheless, well adapted for the purposes to which they are applied. For photographic purposes a purer form should be employed: this may be found in isinglass, (a preparation of the air-bladders of a species of sturgeon, *Acipenser huso*,) and also in Nelson's, Cox's, and Swinborne's gelatine, and in a French preparation known as grenatine. All these are very pure descriptions of the substance under consideration. The method of preparing Nelson's gelatine, which will serve to illustrate the principle involved in the other processes, is as follows:—The parings of skin being well washed, and their surfaces scored, are digested during ten days in a dilute solution of caustic soda. At the end of this time they are placed in an air-tight vat, lined with cement, and maintained at a temperature of 70° Fahr.: they are then washed in a revolving cylinder apparatus with plenty of cold water, and afterwards exposed to the fumes of burning sulphur ($S O_2$) in a wooden chamber. They are now squeezed to expel the moisture, and finally converted into soluble gelatine by water in earthen vessels, enclosed in steam cases. The fluid gelatine is purified by straining it at a temperature of 100° or 120° Fahr.

Gelatine thus obtained is a hard, semi-transparent, coherent, substance, freely soluble in boiling water, but imperfectly soluble in cold water, in which it merely undergoes a kind of swelling. The concentrated boiling solution gelatinises on cooling: a solution, however, containing three grains to the ounce of water, although prepared by the aid of heat, does not gelatinise on cooling. The applications of this substance in the photographic art are very numerous, on account of the property it possesses of forming an insoluble compound with bichromate of potash under the influence of light. The reader will at once call to mind the processes of Photoglyphography by Talbot, Photogalvanography by Pretsch, and processes of a kindred nature by Poitevin, Salmon and Garnier, and others.

A reference to the composition of gelatine given above will show it to be a somewhat complex organic substance, and, as such, prone to spontaneous decomposition under comparatively slight disturbing influences; in view of which the propriety of using it as a material for mounting photographs is, to say the least, questionable; especially when it is remembered that mounted photographs are sometimes hung against damp walls, and that gelatine is a highly hygrometric substance, which, although it may be kept indefinitely in the dry state, undergoes putrefaction when moist. The result of this putrefaction would be in the highest degree disastrous to a photograph mounted with gelatine.

In stating objections to the use of a particular substance, or in noticing difficulties attending the preparation of photographic chemicals, the writer is desirous of meeting, as far as possible, the question which most naturally arises in the mind of the reader:—"Well, since I have *only* gelatine to mount my photographs, is there no way in which I can prevent its decomposition?" To amateurs so unfortunately situated (and there may be many such "up-country" in India and Australia), the answer is—"there is nothing like leather!" Convert the gelatine into leather by washing it over with a solution of tannin or infusion of catchecu or oak bark, and when dry no further decomposition will take place.

Sulphuric acid, oxalic acid, and long continued boiling, deprives gelatine of the power of solidifying on cooling. The solution so obtained has been termed metagelatine, and employed under that name as a preservative agent in a dry collodion process by Mr. Maxwell Lyte.

The most characteristic re-action of gelatine with re-agents is its formation of an insoluble compound with tannic acid and infusion of galls; and it is upon this property that the manufacture of leather is founded, leather being, in fact, for the most part, tannate of gelatine.

Alcohol precipitates gelatine from its aqueous solution by absorbing the water. Gelatine is also insoluble in ether and fixed and volatile oils. The usual re-action between chloride of sodium and nitrate of silver does not take place in the presence of gelatine, which forms an intimate union with the silver salt, requiring the addition of nitric acid before a precipitate of chloride of silver can be obtained. This fact has an important bearing on certain photographic operations; but this is not the place to enter into a detailed consideration of it, our attention being directed in this article especially to the adhesive properties of the substance brought under notice.

India-rubber dissolved in coal tar naphtha has sometimes been recommended for mounting photographs, but is not very generally adopted, probably on account of the somewhat unpleasant odour of the naphtha used as the solvent. The writer is not aware of any chemical objection to its use, since the menstruum for the caoutchouc is completely volatile, and leaves as the adhesive material after evaporation a substance of a most stable constitution and perfectly impervious to moisture.

A LESSON FOR THE LEARNED; OR, A FEW WORDS IN EXPLANATION.

By George Dawson, M.A.,

Lecturer on Photography, King's College.

A photographic teacher would find too much to do were he to fight with and overcome all the dragons and chimeras in the shape of false doctrines and misconceptions which are continually besetting his path in this photographic world of ours. However, I need no apology for doing battle with and, I trust, conquering one of these monsters, which put in an appearance lately in the pages of your contemporary—the *Photographic News*—in the guise of a letter from a correspondent. In that contribution I am stigmatised as a bad chemist, because, in an article published in your Journal, I stated that imperfectly-washed prints, after passing through the acetate of soda toning bath, have a tendency to generate sulphuric acid in the hyposulphite of soda. In order that there may be no misconception, I quote the words used:—"Now, though I perfectly agree with Mr. Dawson as to the importance of thorough washing, I think you will agree with me, Mr. Editor, that his chemistry is quite at fault, when he gives as a reason that 'free nitrate of silver is certain to generate SO_3 in the after fixing bath,' for I cannot perceive how any free nitrate of silver can pass through the toning bath of chloride of gold and acetate of soda without being decomposed; and if it be decomposed, how can it be present so as to generate sulphuric acid in the hyposulphite bath?"

The matter quoted I consider a good sample of those not uncommon *fallacies* in photographic chemistry which, arising from imperfect knowledge, having been once announced, are passed from mouth to mouth, till they begin to be regarded as established facts. The Editor, in a note appended, apologetic for my "thoughtlessness," seems to "agree" with his correspondent, and fully to endorse his opinion. Were he one of my pupils I would show him the following experiments, which may help to place the truth of the matter in a clearer light, and to convince the most sceptical of the chemical and practical correctness of my recommendation. I have occasionally to perform them myself before the students attending my lectures with the same object that I now publish them:—

In a test-tube or wine glass dissolve say five grains nitrate of silver in half an ounce of distilled water (the proportions are unimportant, provided the solution be not very concentrated). Add acetate of soda, in any quantity and of any strength: no precipitate of acetate of silver will fall, even though chloride of gold be present and the solution be kept for many hours. Acetate of silver has not been formed, for it is very insoluble in water; but the nitrate remains undecomposed, as may be proved by adding a single drop of hypo., which will at once precipitate hyposulphite of silver, passing through all the usual tints till the black sulphide remains and sulphuric acid is set free.

If we perform the same experiment, only substituting the carbonate for the acetate of soda, the whole of the nitrate will be decomposed, and hypo. may be added freely without the formation of sulphide of silver and sulphuric acid.

Another experiment suggests itself, which may be still more convincing to those unaccustomed to draw practical deductions from abstract experiments. Cut a newly-printed stereoscopic picture, on rather thick paper, into two parts; pour a solution of acetate of soda, no matter how strong, sufficient only to cover the bottom of a small flat-bottomed dish; add gold, and immerse one of the halves till toned, but do not shake it about, because the water may be in quantity to wash the print sufficiently to prevent the effect I am about to describe; treat the other half, after thorough washing, in a similar way in another bath. Now hang up both to dry, or, to save time, dry by artificial heat, in the dark; then touch any part of the whites or high lights of the unwashed picture with a very dilute solution of hypo., an almost instantaneous formation of a sulphur compound takes place, presenting the appearance of a yellowish brown deposit, insoluble in the strongest hypo., partially so in cyanide of potassium, but totally soluble in bisulphide of carbon. In the other part, which has been washed, no such appearance will be presented, simply because all the nitrate has been previously removed.

Experiments might be multiplied, all tending to the same conclusion. If any one require still further confirmation of the truth of my statement, let him tone a few unwashed prints in acetate of soda and gold: he will find, even after the lapse of days, abundant evidence of free nitrate in his toning bath, by applying any of the usual tests.

I am therefore compelled to repeat, emphatically, what I have before stated as an important precaution when using an acetate of soda and gold toning bath—*wash thoroughly*, otherwise you will incur the risk of decomposition of the hypo. and consequent sulphurising of the prints.

There is not much danger of free nitrate reaching the fixing-bath after the prints have passed through an alkaline solution of gold and bicarbonate of soda, provided the latter be in quantity sufficient to precipitate all the nitrate as a carbonate of silver. The carbonate is readily formed in any strength of solution of nitrate, but the acetate of silver with great difficulty in very strong solutions, and even then the whole of the nitrate has not been decomposed.

Exhibition Gossip.

ANOTHER ACCIDENT.—FOREIGN LANDSCAPE PHOTOGRAPHS.

In my last "Gossip" I chronicled an accident in the French Department, caused by the descent of glass and sash-work from the roof during a heavy fall of rain. In my present I have to chronicle a similar accident in the British Department, by which a group of the splendid stereographs of Mr. Breese, together with the instruments in which they were exhibited, and the strong top of the walnut-wood table on which they stood, have been destroyed. My friend, Mr. Sebastian Davis, had the case containing his ingenious manipulating camera also injured at the same time. It is fortunate that this accident occurred in the morning before the opening of the Exhibition, as otherwise serious injuries might have been inflicted on some of the visitors, the stand of Mr. Breese being seldom without a crowd about it.

In the British Department of Photography we find, since our last visit, various efforts have been made to re-dress the walls and partially fill the blanks caused by removing faded pictures, which blanks are still likely to increase in number if fading pictures continue to be removed.

Our present visit, however, is intended for the Foreign Photographic Departments, and we shall commence our tour of inspection with the French.

The French landscapes, to which our attention is now directed, are not so numerous as the specimens illustrative of other branches of the art; but there are some very excellent pictures of this kind nevertheless. A wild, artificial-looking landscape, by Silvy, has its principal merit in the attempt rather than the deed. Some enlarged instantaneous pictures of sky, water, and shipping are particularly striking from their picturesque and natural qualities. A. Poitevin exhibits good landscapes, some of which are executed by this gentleman's carbon process. E. Jouet, also, has some excellent pictures. A. Davanne contributes some capital landscapes by the Taupenôt process, and P. Gaillard is another successful photographic landscapist. But the great masters are to be found in Marville, Jouet, the Marquis de Bérenger, Aleo, Warnod, and Maxwell Lyte. Warnod's instantaneous views equal the very best and most artistic I have seen; while the grandeur and beauty of Maxwell Lyte's mountain scenes cannot easily be surpassed either as photographs or works of art.

It is evident that, although British photographers have borne away the palm of landscape art from all comers, their French rivals are not so far behind them in the race that in the future they can safely rest upon their oars; although in the French their only serious rivals can as yet be found. The few specimens sent from other lands are either decidedly inferior or simply commonplace. Good and artistic portraiture may be found in very many parts of the great International Exhibition, but good landscape photography is almost entirely confined to the French and English Departments.

In the contributions from Denmark some good street views mingle, and some tolerably good landscapes are to be found among the pictures sent from Belgium. A number of good landscapes have been sent from Canada. A few commonplace views of scenes and incidents connected with the American war, sent by Brady from New York, are in an out-of-the-way corner, near one of the minor entrances. Cheesy-looking views, some of them large and panoramic, are to be found in the New Zealand Department, most of which will be found more interesting to the geologist than to the artist or the photographer. The grand old ruins of Greece have been badly photographed, and are fading away in the collection sent from that country. *The Temple of the Winds*, and basreliefs from the Parthenon, photographed by Constantine, of Athens, are the best among these interesting productions. Some inferior and commonplace landscapes are sent from India, among which are some panoramic views by T. Marten, and some very interesting pictures of the majestic and awe-inspiring temples of India's far, far away and unrecorded past, by Captain Dixon.

South Australia contributes a collection of views chiefly interesting—although many of them are very respectable photographs—from the novel and interesting character of the scenery they represent. Among the best of these are C. Nettleton's, of Williamstone, and E. Haigh, from Melbourne—some by the latter gentleman being very good indeed. A good and large series, illustrative of fossil rock sections and Victorian geology, by R. Daintree, deserve our praise and thanks. From Adelaide we have sulphur-toned prints of street scenes, &c.; from Queensland some sulphur-toned panoramic and other views. Street views from Natal and Maritzburg do not astonish us photographically, although I rather think they were intended so to do. Flood sends some good pictures from New Brunswick; and Allport sends some good stereographs from Tasmania. By-the-bye, I should have mentioned some pictures of the Public Library at Melbourne, which are decidedly good.

But photography is scattered so thinly and widely over the whole building, that, although I think I dare assert that I have examined nearly every specimen of the art it contains, I can find nothing demanding very special notice beyond those specimens to which I have already called attention among landscapes.

In our next "Gossip" we must give some attention to the architectural photographs and the reproductions. A. H. W.

A VISIT TO LONDON AND THE EXHIBITION.*

By A Scotch Photographer.

I considered Claudet's enlarged pictures as instructive; for, apart from any merit they might possess in themselves, they had each a "tender" mounted in the same frame, consisting of an original sized print from the negative. This, as I have said, is instructive; for, at a glance, it lets the spectator see the capabilities of the solar camera. The taste for enlarged pictures being decidedly advancing, it may be somewhat confidently predicted that this will be followed by an increased demand for this instrument, which is said to have recently received some important improvements at the hands of the English manufacturer, Mr. Atkinson, of Liverpool. If it can be used without sunshine for the production of enlarged *negatives*, as I see no reason to doubt it can be, then an objection formerly taken to it by some Scotch operators—that in their "land of mists" the hours of sunshine are so rare compared with those of the sunny south, as to considerably affect its usefulness in their hands—will, to a great extent, be removed by their being enabled to operate not only when the sun shines, but also when he is obscured with clouds.

After reading Mr. Warner's communication *On Enlarging*, I went in quest of his productions with some interest. Not finding them hanging among the others, I at first thought they had been withdrawn, but I afterwards discovered them standing, I suppose temporarily, on the ground, with their faces towards the wall, and circumstances prevented me from devoting much time in the examination of them.

* Continued from page 312.

Being on the look-out for novelties the moonlight pictures of Mr. Breese claimed my attention as a matter of course. How a terrestial subject can be photographed by a brief exposure to the light of

> "That orbed maiden,
> With white fire laden,
> Whom mortals call the moon,"

I cannot well perceive. We in the north consider such a feat an optical and chemical impossibility; but our ignorance protects us. I am aware of moonlight views having been taken by a lens of large angular aperture and a somewhat long exposure, the moon herself not being allowed to show her face on the sensitive plate until experience had determined that the sublunary portion had received its due *quantum* of exposure, when, on raising a shutter for a few seconds, the satellite was allowed to impress her image. Perhaps the beautiful moonlight views alluded to are done in a similar manner; and yet the (as I thought) extraordinary large size of the moon, in one view at least, almost inclined me to the belief that the moon and earth were printed from separate negatives—that of the former being taken with a lens of longer focus than the other.

It must be confessed that there is not much in the Photographic Department of the Exhibition that is new. I saw some huge lens-mounts among the apparatus. It is quite possible there may have been lenses in them, but as they were locked up in glass cases from the vulgar touch, one had not an opportunity of seeing more than the brass-work. "They manage these things better in France," in the Department of which country I saw some large lenses alike beautiful in their finish and powers of definition. Talking of lenses, it is matter of surprise how the French manage to sell their optical goods at the prices they do. I am here reminded of the well-known story of the brushmaker, who, in consequence of stealing all his materials managed to undersell his neighbours, but had his business in turn put a stop to by an antagonist who stole all *his* brushes ready made. One is almost tempted to think that, on the assumption that the English manufacturing opticians charge fair prices for similar goods, the French must have the art of stealing not merely the brass and glass of which their instruments are fabricated, but the ready-made instruments themselves. The photographic portrait combination is an example of this. I have, on one occasion, paid for an ordinary English lens-mount 25 per cent. more than I have paid for an equally well-made French mounting of the same size, *including two achromatic lenses* of good finish; and I have access to a French microscope with a triple achromatic object-glass, the cost of which was fifteen shillings, and which is capable of showing such objects as the markings on the scales of the *Lepisma saccharina* with great distinctness.

In connexion with this subject I may mention that the enlarged photographs of microscopic subjects in the French Department are very attractive and beautifully executed. It is matter of surprise that photographers do not pursue this branch of the science with more assiduity than they do. The preparation of slides, or subjects, for enlargement is by no means difficult. Let us take one as an example, and suppose that a photographer wishes an enlarged view of that lively, sharp-fanged, catch-me-if-you-can little insect, the —— (I dread writing his name). But before cooking your hare you must first catch him; and the same remark applies here. This apparently difficult feat is really not so difficult as it appears at first sight, as the sojourners in some of the London hotels will testify. Awaking early in the morning with "your poor feet" covered with blisters from your having neglected the well-known and only specific for this sore evil (viz., a slight application of common soap to the feet of your stockings previous to your setting out on your walks for the day through the great city), the pleasant reminiscences of the previous day, and equally pleasant anticipations of the present day, are all suddenly driven out of your head as you discover for the first time that you are not as you supposed the only tenant of your couch, but that some nimble neighbour—one of those denominated as at once "a bosom friend and a backbiter"—is making a determined resistance to your invasion of his domain; and forthwith the chase begins, which, after half-an-hour we will suppose, terminates by the capture of the enemy and his being transferred to a small phial or test-tube. How to prepare him for photo-microscopical purposes, such authors on the microscope as Quekett, Carpenter, Hogg, and others, have not left us in ignorance. From the latest edition of Jabez Hogg's work the following quotation will be perused with interest by all who are interested in microscopy, and this, I believe, will include a large proportion of the readers of The British Journal of Photography:—

ON MOUNTING INSECTS.

In mounting whole insects, or parts of insects, I first soak them in the ordinary liquor potassæ of the *Pharmacopœia* for a period varying with the density of the chitine and the amount of muscular fibre to be softened. They are then to be washed in water and pressed until the muscular tissue is got rid of. The object may then be set out with water, in the position it is intended to remain in, on a slide; cover it with another, tie them together, and then immerse them in turpentine. In a few hours the turpentine hardens the chitine, and, if allowed to remain long enough in it, will displace all the water. The object is then to be mounted in Canada balsam in the usual way. Should any water still remain in the object it will cause a milkiness to appear around it when the cover is pressed down. The cover must be removed and the object washed in turpentine as long as any milkiness is seen. If the legs of the insect are allowed to dry, air gets into them, and it is almost impossible to get it out again: by this plan they need never get dry. Some practice and manipulative dexterity are, of course, necessary to mount these objects well. Strong acetic acid will clean insects, but not so quickly as the potass. This has the same disadvantage as the liquor potassæ in containing water. A medium is required which will destroy the muscular tissues, soften the chitine, and combine with turpentine or balsam. This medium, I believe, the Rev. J. Thornton, of Asten Abbots, has found out, and by this means he is enabled to mount the very beautiful insects which we see about. In covering objects I have found that by wetting the cover with turpentine before dropping it on the balsam, it prevents the accumulation of air bubbles.

The object once properly mounted, the subsequent enlargement is easy. As I have been led to believe that an article on this subject is in course of being prepared for reading at a meeting of a photographic society, with subsequent publication in these pages, it is desirable not to anticipate it at present.

Bits of Chat.

A CHAT ABOUT LIGHTING THE MODEL.

In the chat about glass-houses, in "our last," I promised to resume the subject; but, finding that to do so would only tend to give greater emphasis to the conclusions therein arrived at, by proving how similar results may be reached by a very great variety of ways, I have thought it better to trace out more definitely the tangible source of success in a "chat" about lighting the model.

I could describe, as I at first intended to do, a great number of glass rooms with which I have a more or less practical acquaintance, and show, as clearly as might be, their strong and their weak points, their various arrangements, and the results which could be traced to the same; but when this task (necessarily a long one) was finished, I should only have conveyed my readers, by a tedious route, to conclusions which, I trust, will not be the less valued if they are now arrived at by a much shorter road.

As I do not profess in these unpretending little papers to prepare eggs for those venerable old ladies who, as is frequently insinuated, require no tuition in the art of extracting their contents, I shall begin near the beginning, so as to meet, as far as I am able, the requirements of all I have the honour to address.

OF THE DOMINANT OR PRIMARY LIGHT.

The chief art in lighting the model will be found in obtaining, in the first place, a certain amount of good light *direct from the sky*, which, entering your room at a certain angle, will fall upon the prominent features of your model and die softly away into the delicate shades of the more slightly and tenderly illuminated or shaded and retiring surfaces.* In the next place this light, in travelling from the image to the lens, must pursue a no less uninterrupted course. This should be the *dominant* or principal light in your room. No other light should be able to compete with it in power during any hour of the photographer's working day.

How to make this light thus dominant is next to be considered. The first and most readily suggested mode will be the subordination of rival lights by the use of ground-glass, curtains, or any similar means. The ground-glass will do best for rooms in which the angle of the dominant light varies (practically) but slightly during the day, as in a room having a northern aspect; but in rooms where the angle at which the more direct and powerful light enters is continually varying, screens or curtains will be best. In rooms lighted directly by the sun the angle of the dominant light will vary with the position of that great luminary, and the changes to be effected in the arrangements will be frequent. In rooms which are not situated in an open space the most powerful light is very frequently that which enters through the roof, because, coming more directly and uninterruptedly from the sky, it overpowers the weaker and more diffused light which may enter from the front or side. In this case there are only two ways of proceeding, either by shutting out altogether the actually dominant top-light, and making a certain portion of the side-light dominant in its place (by using the aforesaid blinds, screens, or ground-glass), in which case the room must be lofty; or by adopting the plan I mentioned as used by Mr. Fitch, in which a dominant top-light is made, by the angle at which it travels to the model, to serve the purpose of a dominant side-light. As in the first place the power of the light and brilliancy of the image will be very materially decreased, the second plan will be most decidedly the better.

In selecting your principal or dominant light it must not, of course, be forgotten that even a weak diffused light, entering at some aperture very near the model, will overpower an actually dominant light which has to reach the model from a greater distance.

But having conveyed this dominant light thus uninterruptedly to the model, so as to secure its full value as a means of giving force and roundness of effect *there*, we must convey it no less carefully and uninterruptedly into the camera, in order that vigour and brilliancy may be secured to the image on the focussing-screen. If this light, in its journey from the sitter to the lens, has to pierce through a strong body of light crossing more or less directly in its course, it will be weakened in proportion to the power of the light which thus intercepts it, and will reach the lens in a condition decidedly dilute and poor when compared with the power it possessed when it started on its way from the model. Mr. Collings, a photographer who is now building a large photographic gallery in Bury St. Edmunds, recently informed me that he was so impressed with the importance of this that he was having prepared a series of screens to be placed one before the other in the space between the model and the lens, each screen having an opening, and the whole of these openings forming a long huge cone, the smaller end of which will be nearest the lens. The light which intersects the light conveying the image from the sides can then be cut off with curtains running on the rods which connect the screens. How this may answer in practice remains to be seen. I merely introduce the plan as an illustration, but hope to hear further from Mr Collings when he has experimented practically with his novel plan. Galleries standing in open and exposed situations, and running north and south, having the former before and the latter behind the sitter, during the earlier and later portions of the day have direct sunlight on one or the other side, according to the hour. In this case, unless the side-light be subordinated, it will overpower the reflected north light by which the model is illuminated, and so make pictures taken early and late in such rooms very inferior to those secured in the middle of the day, when the south light being excluded the north is dominant—although, even then, if too large a portion of the roof is of glass and not properly curtained, a veil of partially opaque sunlight* will fall down between the sitter and the lens from the roof so as to intercept and swallow up the lesser light coming from the model to the camera.

If the primary or dominant light enter and fall upon the model in the way I have indicated, it will be quite sufficient of a top-light to give due prominence to projecting features by securing delicate cast shadows; and, at the same time, *properly balanced in connexion with other lights*, it will not cast into deep shadow the entire socket of the eye—or give a lugubrious effect to the mouth by deepening the shadows of its descending muscles—or put a black snuff-like patch under the nose—or make lady sitters declaim angrily against the pearly whiteness of their lovely necks being represented as if sooty and begrimed with dirt.

THE SUBORDINATE OR SECONDARY LIGHT.

Force, brilliancy, and clearness, with their attendant charms of crispness and detail, gradation and roundness, having been secured by properly and skilfully managing a dominant light, we must next turn our attention to the subordinate lights, playing as they do important, although less important, parts.

Every portion of the model should have its degree of truthful relief, roundness, and force. If the dominant light fall—as it is by no means uncommon to see it fall—rather upon the centre of the figure than upon the model's head, that light which reaches the head will be *the secondary light;* and it will be impossible to secure those qualities which ought to characterise the most important part of "the human form divine," to say nothing of lost *breadth* and *harmony*, although, in an artistic sense, these are a real *picture's* all-important and least-to-be-spared characteristics.

The place of the secondary or least subdued of the subordinate lights should be found in giving transparency or detail and delicacy to the shadows, in assisting to properly relieve the figure, and in acting the part of dominant light to the accessories.

If the secondary light be too weak, while the figure itself—thanks to a good dominant light—stands well and boldly out, there will probably be a degree of hardness and harshness in the shadows of the head and figure, or a want of relief and reality in

* See remarks about Mr. Fitch's room in the last "bit of chat."

* Landscape painters treat distant scenery, when viewed through the haze of direct sunlight, in a similar way to that in which they treat atmospheric influences.

all the rest of the picture's component parts. The dominant light losing intensity as it diverges in covering a larger field, if it be powerful, aids, and, when very powerful, goes far to serve in the place of the secondary light, *securing breadth and subordination of effect;* but, unless very powerful, unaided, it will not serve our purpose of obtaining "a perfect picture." The action of the lights and that of the shadows upon the sensitised plate are unduly proportioned at the best of times; but, with a weak dominant light, the degrees of power are far more disproportioned, and hard, crude patches of black are found to take the place of those beautiful transparent shadows which should be quite as full of subdued but perfectly visible details, gradations, and forms, as the more luminous portions of the image. To avoid such an unsatisfactory result as these patches would indicate, the primary and secondary lights should be well and delicately *balanced*—the first being concentrated and small, devoted almost entirely to the head of the model; and the last being widely diffused and large, so as to graduate well round about the figure and accessories, each in the order of its degree of prominence, uniting and blending into one harmonious whole, while, at the same time, giving each its relative amount of prominence, and securing the full effect of space before, beside, and behind the model, and all his or her "belongings."

SUBORDINATE LIGHTS.

A still more subordinate light entering at that side of the room which belongs to the secondary light, and stealing quietly in behind the sitter, greatly aids in more thoroughly detaching the figure from the background;* but it must be carefully kept in its subordinate position, and never be permitted to rival in intensity or power, or even come near to, the great mass of secondary light.

A similar light to this, let quietly in say through one or two thicknesses of ground-glass, according to the power of the light at this or that hour of the day, on that side of the room which is the shadowed or darkened side, will more regularly and effectually give the effect of reflected light in the shadows than any arrangement of white screens, surfaces of tin foil, or mirrors can do, and release you from all fear of too strong a reflected light in the eye—a strong reflected light on such a polished, liquid-looking surface being sure to be exaggerated in the finished photograph. This was a plan adopted, often praised, and highly valued by the late Mr. Lacy, of Ryde, Isle of Wight.

The subdued light behind the model makes the space between the form and the background more perceptible, and gives rotundity to the figure by softening those outlines which are only too liable to cut hard and sharp against the background, while that similar light on the darkened side, which glides softly into the shadows, by making retiring surfaces seem more palpably retiring, and performing other truth and beauty-emphasising functions, has no small power in aiding the work which makes all these several lights, thus balanced and united by subordination, blend and work harmoniously in producing a first-class artistic result.

A badly arranged, ill-lighted glass room may, by the aid of chemical knowledge and experience, be worked in with an average degree of commonplace success. But chemicals are exquisitely delicate, variable tools, not always to be relied upon for uniformly good results even by the most experienced; while, on the contrary, in a well arranged and well lighted studio, work becomes a pleasure, ambition an instinct. And even when baths, developers, or collodions generate failures (as in the best-regulated establishments they are wont to do), such failures will be far short of sinking into those abject depths of hopeless wretchedness which characterise the failures of those who neglect one of the most important elements of genuine success in overlooking the importance of well-balanced, artistically-managed degrees of light in their glass studios.

A. H. WALL.

Meetings of Societies.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

THE opening meeting of the session 1862-63 of this Society took place in the Rooms, 75, St. George's Place, Glasgow, on Thursday, the 4th instant, at half-past eight o'clock, when the attendance was numerous, notwithstanding the unfavourable state of the weather.—John Kibble, Esq., President, occupied the chair.

The minutes of previous meetings of Council having been read and confirmed, the PRESIDENT rose and delivered the following—

Inaugural Address.

PERMIT me to congratulate you on our meeting once more, although under a different appellation, still for the same praiseworthy purpose as formerly, viz., the mutual improvement of each other in the boundless and still mysterious field of photographic research. Let all our communion with each other, however much we may differ in opinion, be tempered by mildness and gentlemanly forbearance. In a science such as the one we practice there are so many modifying circumstances and conflicting causes, that different operators treading the same field of experiment, and, as far as they are aware, using the same class of chemicals, will arrive at different conclusions. The temperature, actinism, &c., at the instant of exposure being beyond our control—indeed only made known to us by each result—it is not to be wondered at that so much discrepancy of opinion arises, often very difficult to reconcile; but this, at least, we have in our power—in all our discussions to behave good-naturedly towards one another, and not to imagine our own opinions infallible. It has been said of old that "a house divided against itself cannot stand;" and sure am I that every day's experience must convince all of us of the truth of this, as well as of every other saying embodied in the same sacred volume from which I have quoted.

Since that period when many whom I now see present last met under this roof as members of the recently-dissolved Society, considerable interest has been created by reverting to the basis of photographic science—what is the action of light on metallic salts when in combination with other matter? For instance, when an iodide is used, does the actinism of light cause a reduction of that body to the purely metallic state, more or less, according to the energy and time of action, or is the force communicated catalyctic, electric, or what? In other words, is the nature of that property communicated to the sensitive medium by which it appropriates the silver of the decomposing developer to the building of a visible image corresponding to the one which has been impinging on its surface for a few seconds? I do think that this is a subject of paramount importance, and that too much attention and labour cannot be bestowed on it. Of course, from the time necessary, it is but the few who can afford to investigate such a subject, the time most suitable for such exploration being the very hours most in demand for practical photography; yet, until something like certainty is known of this latent mystery, our experiments must be in a manner mere groping in the dark.

Another very interesting hint has been thrown out by the keen, observing Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY upon the probable action communicated to glass by superincumbent photographs, which, after a lapse of time, on being cleaned off and the same glass used for subsequent portraiture, on developing, the original subject again makes its appearance in a spectral form—like *Hamlet's Ghost*—to the dismay of the operator, but with this marked difference, that the mere crowing of a cock will not effect its disappearance; indeed, I have had instances that none of the simple or mixed acids or alkalies would even weaken—presenting some of the rarest specimens of the persistence caused by light I have yet witnessed. My own impression is somewhat different from that hinted at by Mr. Shadbolt; but as that, in combination with another equally mysterious action, is at present occupying my leisure time, I will not now offer my humble opinion, as at some early date I trust to have the pleasure of reading a paper which will at least have the effect of opening a discussion on that and similar actions.

Upon instantaneous results I hope also to offer a few observations, as in reading the journals occasionally I have met with remarks which clearly convince me that many do not distinguish—or are not willing to do so—the great increase in difficulty in arresting the image of the waves at something like two hundred yards' distance from the lens, and that of a body, such as a steamer, moving through ten times the space in the same amount of time, also at a right angle to the axis of the lens; that is, a movement that can be almost arrested in one-tenth of a second in the one instance, will require exactly one hundredth part of a second in the other instance—two very different achievements to effect. I may mention that, through the kindness of Mr. Grubb, of Dublin, my efforts in instantaneity have been greatly expedited. With one of his patent aplanatic view lenses, three inches diameter fifteen inches focus for parallel rays, I can obtain an equally sharp and well-defined photograph in almost one-half the time of exposure that was necessary for my former lens which I have used for the last eight years—same diameter but sixteen inch focus—and which, until I received his, I considered first-rate. I hope against our next meeting to have some samples worthy of your examination, not only in instantaneous results, but the interior of a conservatory, showing the great depth of focus possessed by the same lens.

This season has been most unpropitious for photographic instantaneity. I have, for the last month, had all my apparatus packed ready for starting the short distance of one and a-half miles from my own domicile to obtain a view of Loch Long; but it has either rained on the day fixed, or there was an absence of clouds—the seascape terminating in a misty, half-visible distance. From present appearance there is not much to hope for in the way of improvement in the latter end of the season. The absence of sunshine I do not so much regret, so long as the horizon is clearly defined. In many instances the want of it is an advantage, were it only for variety's sake. The photographs, though wanting in sparkling brilliancy, have something peculiarly soft and Turner-like in their appearance, and add specimens to our register of some of those rare but evanescent aspects in which nature delights to revel.

* My attention was first called to this effect by my friend, Mr. Hannaford, who greatly admires it.

That photographic portraiture is rapidly gaining a high position in the public mind there can be no doubt, and bids fair to become one of the most perfected discoveries of the present age. Let us add our efforts to the mass, and, having put our "hands to the plough," speed boldly onwards: there is power in combination as well as in knowledge.

Since our last meeting of Council, some weeks ago, my time has been so fully occupied that I trust you will excuse me for not entering more fully into our prospects for the future. I am aware that the subjects fixed on for to-night will fully exhaust the time allowed for our meeting; so that I have no compunction in ceasing to trespass on your time. I trust the hopes and good wishes of all will be fulfilled, and that the Glasgow Photographic Association will progress in knowledge, wisdom, and, if not in peace, at least in friendly feud with one another, and in harmony with all its *sun*-enlightened brethren.

The PRESIDENT then called upon Mr. A. Mactear, one of the Vice-Presidents, to give his promised account of the summer excursion.

Mr. MACTEAR then gave an interesting narrative of—

A Day with the Panoramic Lens and Camera.

THE 24th June, 1862, being the day set apart for the Glasgow photographers' holiday and excursion, you would have thought that they had all followed the advice of their fellow-man and brother—the old negro in the "Octoroon"—when he said "Shut up ye black trash," as nearly all shut up that day.

At first it was in contemplation that all should go together; but second thoughts approved the idea that various parties should, like Burns's "twa dogs," each take their several way, so that more of "the scenes that are fairest" might be had for our portfolios.

Mr. Stuart, an energetic member, made up one excursion party (to try the panoramic lens and camera), consisting of his brother, four professional friends, and myself—the place of rendezvous being Mr. S.'s cottage at Helensburgh, and the base of operation Luss, on Loch Lomond. I went down the afternoon before with Mr. S., when he showed me the whole of his arrangements for photographic printing, and really they are so complete that one is unable to suggest any improvement.

At one place you see a range of barrels for collecting rain water, having elastic tubing leading to other parts of the premises. There is also a deep well, with a force-pump, which supplies the house likewise. In another place is seen merely the upper part of a barrel with a lid which has suffered burial in the ground, and whose duty it is to receive all the first washings of the prints, and when it is full the chloride is laid aside to be converted into the real "*Simon pure*." We now enter the sensitising room, where everything has a very bilious look: here all is in good order. Passing into the next room we see innumerable printing-frames, and the negatives laid out for that day's work. Immediately outside of this is where the printing goes on: it has a roof of glass, and a glass front, which is made to slide aside in fine weather, and is only used when it is raining. The washing apparatus consists of a large box, with a number of frames covered with brass wire gauze, each having a number of prints, and it does its duty well. The toning and fixing room is also well arranged. After seeing these we went up stairs to see that the bath and all the other things were in order for our excursion next day with the panoramic lens. A picture of the street from the window showed all was right, and I was a little astonished at the rapidity of action of this lens. In this room all the negatives are stored and classified, besides a solar camera with a moveable screen, having as many motions as Blondin himself, quite ready to do large work when the fashion turns in that direction.

The morning of the 24th was a damp, steamy one, the south-west wind prevailing, and our prospects were anything but cheerful. One of the professionals (Mr. B.) said that he would take the "teetotal" lens, when it was remarked that teetotallers are always *under* the "spirit level." Mr. E. could'nt see the analogy at all, as it was quite evident the lens could do nothing without a "drop in its eye." All things, according to the "manifest," being shipped, in we go, and, like Gilpin's hat and wig, we are soon upon the road.

Entering the Luss road, which is very steep, we ascend but slowly, and have time to admire a far outstretched view of the Clyde, with its surrounding scenery, from beyond Dumbarton round and beyond the peaks of Arran. What a lovely panorama! A few minutes before there was not as much blue in the sky as would have made "breeks tae a Hielandman:" now great breadths of azure arise, and everything looks fresh amidst the glorious sunshine, as we are driving along far, far among the "Hielan hills," 'midst Nature's wildest grandeur.

Having gained the highest part of the road, Loch Lomond, queen of lakes, bursts on our view, which, although we have often seen before, always impresses our minds with wondering awe and delight. Every place has its legendary story of what was enacted by, and what befel, the chiefs and clans, Colquhoun and McGregor, when their roofs were given to the flames and their flesh to the eagles; and too many, alas! were the cold-hearted butcheries enacted there. Now, how changed! The chiefs and their clans fraternise as if no feud had ever existed between them, prosecuting the arts of peace; so that what was once "a springing bog and false morass" is now blossoming with the fruits of the earth.

We now wend our way downwards, and, as we arrive at Sir James Colquhoun's gate, we drive through his magnificent grounds—an almost interminable avenue of trees in splendid order—passing through the other gate, when we see many a goodly tree with its doomed mark—"cut it down."

Arrived at the hotel, we are not long in commencing our work. Off we go to the Glen of Luss, each one carrying his allotted part, and our friend Mr. B. with the "teetotal" lens.

After passing the saw-mill the stream is rather broad, with huge slaty boulders (Luss Slate Quarries are on either side of us). Trudging on through furze and loppings of young trees, "we saw by the smoke that so gracefully curled above the green elms that a cottage was near," and sure enough we came upon a very picturesque spot where there is an old Highland bothy—the one-half of which only was habitable, the other being in a state of dilapidation—with a mountainous background. Round the door are a number of blooming healthy children, clean and tidy, who, with their mother, are astonished at our movements while pitching the tent, &c., which was soon accomplished beside the Glen. It was no wonder they were astonished, as it was "A., run you for the water!" —"M., get up the tent!"—"E., group you the figures!" and so on.

At length a plate was coated, but the wind partially dried it; it served, however, as a pioneer for the time of exposure. The tent—no! I mean the "chamber of horrors"—was too small and confined; so the woman of the bothy grants us permission to use her kitchen. The bed mat (or counterpane) is put over the window, which shuts out the light from thence; but Mr. B. remarked that we must stop the light coming down the lum (chimney), and he put up a green umbrella belonging to his wife, which answered admirably. Have you ever observed the clever ingenuity of photographers? If not, I have, many a time.*

The darkness now was dreadful to contemplate, and what between groping for bottles, &c., it was doubtful if the thing could be managed at all, when another plate was announced ready, then exposed. It is good as a positive, but wants strength as a negative.

A candle now being got, Mr. B. gives the umbrella to another, to enable him to assist Mr. S.,—so that the next would astonish us. All went right until the developing (the developer and the cyanide were in similar bottles), when, as luck would have it, Mr. B. took the wrong bottle! The imagination can easily conceive the result. S. was wroth, and, as he was talking very loud, I went into the dark-looking den to see what was wrong; when, tumbling over a cradle, I seized the first thing which came to my hand, which happened to be the cords and weights of a cottage clock, which quickly stopped any noise from that quarter. It was, however, soon put to rights again. The interior of that kitchen presented a scene to my eyes which shall not be easily forgotten. My tumble, strange to say, restored quietness; and, to please me, I suppose, I got the umbrella to hold up the vent, so that I might give vent to my feelings while another plate was got ready. This one turned out very well, as you will see from the print—our happy party are disposed in every direction—a *souvenir* of a bright and pleasant day.

It is resolved to change the scene, and scouts are out to choose for the picture, when a spot in the Glen is fixed on—a fine shady nook; and, while the plate is preparing, A. and E. are away round by the waterfall to a spot opposite, "where feathery brackens fringe the rocks," and you will find the two worthies, bathing their feet in the cool water, in the other picture before you, which is a very successful one.

Having taken another of the same, the traps are packed up, and away we go retracing our steps to the inn.

I might have said more regarding the lens and camera; but, as I know that Mr. Ewing has thought over it, as well as other members, I hope they will give expression to their sentiments on this interesting subject.

Mr. Mactear in the course of his address exhibited four views taken with Sutton's panoramic camera, from scenes in the Gareloch and Loch Lomond—time of exposure seven to fifteen seconds, with a diaphragm of three-sixteenths of an inch. These pictures were very good productions, the more especially as the operators laboured under many and great disadvantages, from want of proper accommodation for their pursuits. One of the pictures was exceedingly beautiful and perfect, and all possessed more or less merit. They excited much curiosity and attention, being the first pictures taken by the panoramic lens in the West of Scotland, and serving as a practical demonstration of the utility thereof for landscape photography.

Mr. EWING expressed the satisfaction all must experience in seeing his old friend, Mr. Kibble, once more presiding over their meetings. As an accomplished photographer and an enthusiastic experimentalist all must acknowledge his eminent capability for the presidency of such a Society; for, not only was he undaunted at research, but always ready to communicate the result of his labours to those interested in the art, and he trusted that he (Mr. Kibble) would long occupy his present official position in connexion with the Society. He (Mr. Ewing) then entered into a few explanations respecting the practical use of the panoramic camera, on which subject he led the meeting to hope he might be induced to furnish them with a paper at no very distant period.

Some discussion followed respecting the various details in the use of the panoramic camera, in which several members took part.

The Chairman then called upon Mr. J. Spencer, jun., who exhibited a new method of mounting lenses—the invention of M. Vallentin, of Paris

* In a Highland bothy the chimney is generally in the centre of the roof, the fire being lighted immediately under it on the floor, without any fire-place.

—by which great economy of space is obtained. The lens was an ordinary portrait combination, with an adjustment for views, but by a telescopic body, and the nozzle or sun-shade being reversible, so as partly to cover the mounting of the lens, and the cap being made to screw on the back part of the mounting, it was protected from risk of breakage in carriage. The arrangement is of course only of advantage to those who have occasion to move from place to place.

A camera slide was also shown by Mr. Spencer, which he thought had several advantages over the old form. Instead of being made with a door or slide to draw up in order to expose the plate, this was made on the principle of the patent shutter now in use in the shop windows, or, to adopt a more photographic illustration, on the same principle as Mr. Dallmeyer's moveable division for his binocular camera, *i.e.*, small pieces of hard-wood fixed on strong linen or thin leather, so as to make it perfectly pliable, and the end of this is brought through the top of the cell, so that it is only requisite to pull the end which is next you (when the cell is in the camera) in order to expose the plate, and push it gently upwards in order to close it again. The advantages to be gained are certainty of preventing light getting to the plate in the act of drawing up the door, as so frequently happened in the old form; and for portraiture the benefit secured is that you expose the plate without the sitter being aware of it. For professional men this is a considerable advantage, as the sitters are very apt to settle in an awkward manner when they see the door of the cell pulled up.

Mr. Spencer further exhibited some very beautiful pictures of country scenes, and card-pictures of cathedral interiors, taken by Mr. Wilson, of Aberdeen, all possessing considerable merit, and which were much admired.

The President then introduced Mr. Crombie, from Auckland, New Zealand.

Mr. Crombie expressed the pleasure he felt in being present at the meeting, and also gave a short account of the position of photography at the Antipodes. In Auckland, with less than 7,000 inhabitants, he said they had four photographic artists, so that, in that respect at least, they showed their appreciation of the art—the proportion of photographers to the inhabitants being far greater than in this country. He (Mr. Crombie) had visited this country in a professional sense, for in New Zealand he was necessarily isolated in a photographic sense; and hoped, by the kindness of brethren on this side of the world, to learn much before his return.

Mr. Crombie then exhibited some very interesting specimens of his own productions, amongst which was a picture of Auckland, in six pieces, each ten by eight inches, embracing a panoramic view about five miles in extent; also some beautiful views taken in the neighbourhood of Auckland, including one of the village in which was held the conference between Her Majesty's representative and the native chiefs. These pictures were evidently executed with considerable skill, and reflected great credit upon the artist, to whom an "honourable mention" has been awarded at the Great Exhibition.

Mr. Stuart, in moving a vote of thanks to Mr. Crombie for his attendance that evening, said he was sure all would be delighted at the illustrations from the other side of the world which they then had an opportunity of inspecting; and, although the extreme clearness of sky there presented many difficulties in operation, and could not produce that softness and variety which those beautiful fleecy clouds peculiar to this country effected in pictures taken here, still they were extremely creditable productions, and displayed considerable knowledge in the art. He (Mr. Stuart) was sure that all the professional artists of Glasgow would be happy to accord a welcome to Mr. Crombie or any other of their fellow-labourers from the Antipodes.

Mr. Traer, in seconding the motion, said he felt sure all present would feel pleasure in welcoming Mr. Crombie, and would afford him a hearty response to his thirst for increased knowledge of the art. Photographers in many of our colonial dependencies must suffer much from isolation, as no doubt professional jealousy would prevent any local combination for the advancement of the art where its operators were so limited; whilst in large communities such jealousies were seldom of long duration, and invariably sooner or later gave way in the general eagerness for progress. He was sure all would experience great satisfaction in Mr. Crombie's presence that evening, and would ever be ready to receive with a hearty welcome any of our colonial or foreign photographic brethren whenever they might chance to visit this country, besides every one being desirous of affording them whatever assistance they could in extending their knowledge of our interesting art.

The motion was carried unanimously, amid much applause.

Mr. Crombie gracefully acknowledged the compliment which had been paid to him, and expressed the satisfaction he had experienced in the cordiality he had met with, which far exceeded his expectations.

Mr. Bowman then drew the attention of the meeting to a simple contrivance made, as he *naively* remarked, "*out of his own head*," with a view to obviate the necessity of having large and costly machines for the mounting of card and small photographs in establishments where there might be but little demand for such. It consisted of a slab of polished iron on which was screwed a plate of copper of the same size; a tympan of cloth or silk is brought down on the slab, and over this is rubbed firmly a scraper held on each side by the hands; the prints and cards, previously damped and starched, are kept under sheets of blotting-paper to preserve them moist. The card is then taken up, the print laid upon it and smartly rubbed down, when it is ready for the glazing press. By this cheap and simple method a great many could be done in a short time much cleaner and neater than when mounted by hand. He remarked that it might, perhaps, be called a modification of Mr. Stuart's method.

Mr. Stuart begged to differ with this opinion, as by his plan the prints were not damped, and he dared say that he could mount more cards in a given time by his process than Mr. Bowman with his new application.*

Mr. Bowman assented to this, but stated that, although he could use his large lithographic press quite as effectively as Mr. Stuart, such was not his point, but simply to introduce a handy little apparatus, whereby those who did not require large machinery might meet the desideratum.

A vote of thanks was awarded to Mr. Bowman.

Mr. Bowman also produced a pair of wooden pincers for holding the plate while intensifying the negative, which he thought was new.

Mr. Ribble remarked that he had used the same over six years ago, showing another example of "parallel ideas."

A general conversation followed; after which,

Mr. A. Macnab proposed a vote of thanks to Mr. Mactear for his paper. Votes of thanks were also awarded to the President for his address, and to Mr. Spencer and other gentlemen who had exhibited on the occasion.

The President, in bringing the business of the evening to a close, remarked that he hoped as they had then made a favourable start, it would be well if in future each member tried to keep up the harmony which had characterised that meeting, as by such friendly feeling towards each other the Society could not fail to prove a useful and permanent institution.

New Books.

Treatise on Photography. Third Edition. By Charles Waldack. Cincinatti: H. Watkin, 140, Third Street.

We believe that Mr. Waldack's treatise is highly popular in American The author is certainly a practical photographer, and evidently a diligent reader of photographic literature; for, in the edition of his work now before us, the various questions which have of late attracted the attention of both professionals and amateurs amongst our guild are either discussed or have some allusion made to them, and in such a manner that it is abundantly clear that they have come under the personal scrutiny of the writer of the work, who is, no doubt, a skillful operator. As he brings also a considerable amount of intelligence to bear upon his investigations, his conclusions are in the main reliable. There are, however, some points of scientific inquiry with which his acquirements have not enabled him to cope, and in them he is consequently a little at fault; still his readers will have but small cause to complain, as his volume consists of nearly three hundred pages, octavo, filled with good and useful matter—all of present interest, for the whole of that which was obsolete has apparently been omitted from the last edition. It will be perceived that we approve generally of the contents of the work before us; but, though so large a volume, we can honestly affirm that we have not learnt a single new fact from its perusal, nor is there anything that we can quote that has not already been placed before our readers in the pages of this Journal during some part of its existence. But in asserting thus much, we would not have it supposed that we charge the author with mere paste-and-scissors work; for though all the materials have been originally acquired from other sources, they have not been re-applied in their original form, but have undergone careful examination and generally judicious selection and digestion before having been employed for reconstruction; and, even if the design of the structure be not actually new, it is to some extent after an excellent model, viz., Hardwich's *Manual*. We regret to find so few persons named to whom the present author is indebted for much of his matter. A few acknowledgments are made it is true, chiefly to American authors, and Hardwich and Maxwell Lyte come in for a small portion only of the credit which is justly their due; but these are exceptions to the rule.

On looking through our notes made during the perusal of the volume we find that those of assent to the conclusions arrived at very far outweigh in number those of dissent; and lest, from the remarks we have felt bound to make above, we should seem to have depreciated Mr. Waldack's labours, we think it but right to state that we appreciate them highly—that we regard them as eminently useful and worthy of much commendation, so far as they relate to photography. Such exceptions as we have taken belong rather to literary than to photographic economy.

The treatise is printed in a good, bold, clear, readable type, that is quite a comfort to have to deal with in these days, when the prime object of printers appears to be to cram the utmost amount of matter into the smallest amount of space; and, further, the shape and size of the volume is such, that it might be with propriety—though it is not—called a manual.

Collodion.—A correspondent writes as follows:—"I am more than ever in favour of Bolton's collodion. I used to consider it slow; but I have taken some almost instantaneous portraits of children and find the range of exposure very great, and it is so beautifully clean and free from spots or stains! Its only defect is that it is, in my opinion, rather too thick: I generally add a little ether."

* Unfortunately Mr. Bowman's apparatus did not work very well from the blotting-paper being too wet, which of course marred the demonstration of its efficiency.

Scraps and Fragments.

How will Austria Class Photography?—It is reported that another Grand International Exhibition will be opened in the year 1865, at Vienna. We hope the Austrian photographers will learn the lesson we are now receiving, and act upon it in good time.

Masterpieces of Industrial Art and Sculpture at the International Exhibition.—Messrs. Day and Sons have obtained all the photographs for this important work. The plates, 300 in number, including nearly a thousand subjects, have been executed by Mr. Stephen Thompson.

Comments Connected with the International Exhibition.—A clever amateur says:—"When at the Exhibition I was much amused at hearing that a person named Barrable had gained a prize medal, and another, called Beatty, "honourable mention," for photographs, though they had not sent any pictures to the Exhibition: the former intends to get the medal.—The French Photographic Gallery seemed much neglected, though there are some good things among them.—Our Colonies make a good show: some equal any in the building. There is one frame or stand, under the eastern dome, of six very large landscapes, particularly well done: I could see no name attached. *The Leaping Toads* (mountains) was in pencil on one."

A Caution.—A photographer in the provinces lately drank by mistake a glass of water in which was dissolved a large proportion of cyanide of potassium. Only on withdrawing the glass from his mouth was he aware of his mistake, the fatal consequences of which he averted by swallowing a solution of iron, followed as soon as possible by an infusion of the *Lobelia inflata* herb (procurable at all medical botanic shops), the emetic properties of which speedily rid him of the dangerous contents of the stomach. We some time ago published a list of the poisonous substances used in photography, with their appropriate antidotes, and cannot too strongly impress on our readers the importance of having this hung up in their operating-rooms, so as to be accessible to all who, through negligence or accident, may require timely assistance of this kind.

Mealy Paper and Impure Hyposulphite of Soda.—A photographic friend sends us the following:—"I am still much troubled with mealy paper: the acetate toning does not cure it. I have a lot of paper (Rive) which blisters in the hypo., and must, from it getting between the paper and albumen, be impossible to remove by washing. I have been thanked by dealers for calling attention to the impure hypo., and have had plenty sent me quite pure. I was glad to see a confession as to the bad quality of ——'s paper for albumenising. You can very frequently tell a mealy sheet of paper before sensitising. When I first used the alkaline toning process, I had a supply of paper of different makes, and never found any trace of mealiness. Since that was used up I have not had a dozen good sheets until now. *Thin* Saxe and thin Rive are very good: it is wasting money to buy thick."

Another Distinguished Deserter.—The law seems to be an exacting mistress, and will not brook a rival so dangerously attractive as photography is admitted to be. Mr. J. C. Stevens has announced that early in November he will put up for sale the whole of Mr. Roger Fenton's photographic apparatus, consisting of lenses, cameras, negatives, &c. Mr. Fenton was one of the most active of those who gave being to the Photographic Society of London, and was its first Secretary—the post then being an honorary one—and he remained in that position until the year 1856. As *The Times* recently said, Mr. Fenton was "probably the first photographer who ever pitched his camera-stand under fire" on the battle-field, and we all know that the photographs from the Crimea were at least as eloquent of the sad truths of that terrible war as were the word-photographs of his fellow-labourer, *The Times*' correspondent. During the three years Mr. Fenton was the Society's Honorary Secretary the Society grew and flourished famously; and on his present retirement from our ranks altogether, we cannot do better, perhaps, than quote the remarks of Mr. Robert Hunt, made upon his retirement from the aforesaid office of Secretary. "I beg," said Mr. Hunt, "to state emphatically, that in my opinion the Society would never have had an existence if it had not been for Mr. Fenton. When there was only a Photographic Club, Mr. Fenton not only acted cordially with the gentlemen who formed the first Council of the Society, but exerted himself earnestly to induce Mr. Fox Talbot to become our President. Several meetings took place, at the whole of which Mr. Fenton was the ruling spirit. We cannot, therefore, too strongly express our thanks to Mr. Fenton for the existence of the admirable Society of which he really is the parent." Cordially re-echoing Mr. Hunt, we bid Mr. Fenton adieu and God speed.

Photography and Literature.—Mr. Lovell Reeve, who has recently published, in *facsimile*, by the new process of photozincography, Shakespeare's *Sonnets*, and *Lover's Complaint*, will follow it up with the *Venus and Adonis*, *Lucrece*—the rare quarto plays published before the collected edition of 1623; and, lastly, the famous folio itself. *Much Ado about Nothing* is already in hand. —*Public Opinion.*——Some other important photographically illustrated works are in course of preparation for the ensuing season, including an illustrated edition of Scott's *Marmion*, the illustrations of which will be chiefly by Mr. Stephen Thompson.

The Bride Elect of the Prince of Wales.—The *Daily Telegraph*—a paper that generally soars into enthusiastic praise of all that is royal in Britain—thus speaks of the card-portraits of the Prince of Wales's elected bride:—"Photography, with all its beauties, is harsh, dark, and intractable in its deviations from truthfulness, especially in the harmonies of tint; and although it has favourably impressed the world with the aspect of the fair lady, it has failed to mirror the real brightness, freshness, and grace of her appearance: while it needs much more than black glass to give the 'charm' of her manner, or the truly amiable qualities of her nature." How singularly quick we sometimes are in discovering beauty in all the features of face and form, mind and nature, when the happy possesor of the same has been marked out by fortune for some lofty position! A single glance conveys all these charms and beauties of mind and person *when thus associated*, while without such associations they could only be discovered through the medium of a comparatively long acquaintance. Photography is all very well for meaner folk; but, oh, *Daily Telegraph!* how harsh, dark, and intractable are its deviations from truthfulness, when it dares to mirror British Royalty! Still let us (in a whisper) confess that photography is no courtier. It speaks as honestly of the peasant as of the prince; and, truth to tell, says of this gentle-looking bride elect that she at least seems a very amiable and rather pretty-looking young lady, decidedly prepossessing in appearance, and if pose, dress, and expression may be speculated upon, of a simple, lady-like, and unaffected character.

Photography in the Alps.—M. Bisson, a photographer who has done much to give a better idea of the difficulties of mountain ascents than the most loquacious members of the Alpine Club, while descanting upon his own feats, has recently repeated his climbing of Mont Blanc, not so successfully as before. So far as the Grands Mulets, nothing particular happened, says the *Moniteur;* he took views of different points, and then proceeded to the Passage des Echelles, where he and his party crossed the ravines, 300 feet deep, crawling, on horizontal ladders, one by one, on hands and knees. A bridge of ice and snow, that formerly served as a passage to the Grand Plateau, had broken down, leaving an abyss before the travellers, and cutting off their approach to the Dôme de Goutté. Three of the guides, however, succeeded in cutting a path towards the summit of Mont Maudit, which they traversed, helping up the remainder of the party, and ultimately the whole got, by a new and very dangerous route, to the Grand Plateau. New difficulties appeared at every step: 800 footings had to be hewn, in order to ascend the Corridor; that had in places an inclination of fifty degrees. After all this labour, on reaching the summit, M. Bisson found the silver of his plates had crystallised, the temperature having fallen ten degrees Cent., even at noon. At two P.M. he descended from the summit, returned to it again on a subsequent day, without further accident, and then, we presume, procured the photographs he sought to obtain.—*Athenæum.*

Foreign Correspondence.

Paris, September 11th, 1862.

I have but scarcely returned from an excursion to London, where, in consequence of the shortness of my stay, my attention was almost exclusively devoted to the Kensington Palace. I can therefore hardly commence this letter otherwise than by communicating to you some of the impressions which I have brought back therefrom.

First of all I will confess that I was struck by the fewness of the pictures composing the French and English photographic galleries. Although I was informed beforehand that several English photographers had been obliged to withdraw their frames on account of the damp, I did expect to find a much larger variety of specimens from English artists. Is this paucity attributable to the smallness of the space allotted, or to the fault of the jury of admission? or

were my own anticipations immoderate? I cannot say: I merely record my impression.

On this occasion I was as much as ever, and even more than ever, delighted at the perfection to which your landscape pictures have been brought. Your climate and your light, and your perspectives toned down by a peculiar atmosphere, have, I know, something to do with the success; but all that does not diminish the merit of your artists, which is entitled to the sincerest admiration. What I admired with all the simplicity of a child, with all the heartiness of one ignorant of the means employed for producing the charm, were Mr. Breese's stereoscopic and phantasmagoric views. There was especially one view of a simple cliff, beaten by the waves and dimly lighted by the moon, at which I gazed so long that the bystanders, wishful to share the pleasure, began to grumble. But I am not about to give you a report on photography at the Exhibition. THE BRITISH JOURNAL OF PHOTOGRAPHY has a staff of critics whose ability renders it supererogatory.

I must tell you that during my stay in London I was enabled to appreciate, from ocular demonstration, the system proposed by M. Claudet, in a recent article, for the amplification of photographic images. M. Claudet made various experiments, and I verified with the compasses the mathematical accuracy of the results obtained with his proportional scales—one of which gives the distance for any dimension from the negative to the lens, and the other the distance from the lens to the screen. I was the better able to appreciate the value of this system from having so often witnessed the trouble to which our Parisian photographers are put for ensuring the right degree of amplification, and, above all, the accuracy of the focus.

Immediately after my return yesterday, I went to see the pictures brought back by M. Bisson from his recent journey to Mont Blanc. They form a numerous and interesting collection. There is a series of views taken in the Oberland. I was struck by one taken between Meringen and Rosenlanï, in which the Vetterhorn is seen rising majestically above the modest *chalets* scattered in the valley. Then there are views of the glaciers of Rosenlanï, of the lower glacier of Gridenwald, and especially one of the Jungfrau, taken from Interlaken, and a splendid panorama of Thoune.

The principal part of this new collection is that comprising the views taken during the different stages of the ascension of Mont Blanc. The first is that of the Grands Mulets lit up by the setting sun; then comes the Dôme du Gouté, with its *sĕracs;* then the famous Ladder Passage, in two very striking plates. The little troupe is represented climbing slippery heights, where giddiness would be death. In another picture they are seen under the Grands Mulets, passing, with the aid of a rope which they each hold, over the new-fallen snow, which is as smooth as ice. And, lastly, at a height of 4000 yards, they are boldly scaling an immense *crevasse,* where every giddy foothold has to be cut by the pickaxe, and where the necessary baggage has to be drawn with ropes.

This view is the last. M. Bisson did indeed reach the summit, and there pitch his tent, while the cannon of Chamonix blazed forth in his honour; but when he tried to operate he found that the nitrate of silver crystallised on the glass. However, his journey was a very bold undertaking, and the success he met with highly honourable.

I have just been informed that the monthly meeting of the Marseilles Photographic Society, which had been interrupted for the holidays, will be resumed at the end of September.

ERNEST LACAN.

Correspondence.

BROMIDES IN COLLODION.

To the EDITOR.

SIR,—I beg to endorse fully the experiments made by Mr. Sutton on the effects of bromides in collodion and on the bath. They were not, however, directed upon the combined effects of iodide and bromide as compared with those of iodide alone—although, inferentially, the inferiority of such combinations may be assumed.

An extraordinary amount of misconception exists regarding the use of bromides generally, while a few photographers attach little or no importance to those salts. If we regard the question of sensitiveness, the latter have the unanswerable argument of inferior sensitiveness of bromide to the invisible image in support of their repugnance; while the former are right in its use only as regards its superior sensitiveness to the green and yellow rays, when in subjects of some contrast its presence is indispensable. Of course its use implies the sacrifice of sensitiveness.

It is not at all impossible to go on making bromo-iodisers superior to given iodisers *up to a certain limit;* but an iodiser ultimately cannot be equalled, remembering to use *one collodion* in all such comparative experiments, so as to ensure an uniformity of conditions, or as near so as approachable—a matter apparently overlooked by Mr. Blanchard in his experiments. The collodion which will give a sensitive *bromo-iodised* medium will give a still more sensitive *iodised* one.

In all comparative experiments I think it will be admitted that *like salts* or *like combinations* should be arrayed against each other—not potassium or ammonium against cadmium, or against cadmium and potassium combined, or ammonium and cadmium combined; for the superiority of cadmium, and of combinations including it, over potassium and ammonium, especially under iron development for both, is not a matter of inquiry, except for the novice. Yet such has been the extraordinary error of Mr. Blanchard (see experiments, THE BRITISH JOURNAL OF PHOTOGRAPHY, May 15, 1862), and the result has been triumphantly taken as a solution of the question of bromo-iodides *versus* iodides—a question the introduction of which for discussion was quite a marvel to Mr. Fry, inasmuch as the inferiority of iodides could not be disputed! The whole affair looks very much like a conspiracy among the instantaneous photographers to throw dust into the eyes of the struggling disciples of the black art.

Besides the equality of conditions obtained by arraying like salts and their combinations against each other, it is necessary that the proportions in each should be about equal, at the risk of the quantitatively inferior salted collodion working worse than the other. It is the practice with some photographers to use more salts in bromo-iodising than if simply iodising collodion, the difference being added in the shape of bromide; but, after careful experiment, I have found this practice objectionable beyond a certain point, as the collodion, by being surcharged, does not work as it should. In other words, Mr. Blanchard's proportions for his iodisers and bromo-iodisers, and the salts for the same, with one sample of collodion, should have been something like the following, also one bath very slightly acid:—

EXPERIMENT No. 1.

Mr. Blanchard's Iodiser—Iodide of ammonium, 3½ grains.—*Proposed Iodiser*—Iodide of ammonium, 3½ to 4½ grains; iodide of cadmium, 1 grain.

Mr. Blanchard's Bromo-iodiser—Iodide of ammonium, 4½ grains; bromide of cadmium 1 grain.—*Proposed Bromo-iodiser*—The same as Mr. Blanchard's.

EXPERIMENT No. 2.

Mr. Blanchard's Iodiser—Iodide of potassium, 3½ grains.—*Proposed Iodiser*—The same.

Mr. Blanchard's Bromo-iodiser—Iodide of cadmium and ammonium, 4½ grains; bromide of cadmium, 2 grains. (Now this is very unfair.)—*Proposed Bromo-iodiser*—Iodide of potassium, 3½ grains; bromide of potassium, ½ grain.

But, if Mr. Blanchard's bromo-iodiser be retained, his iodiser should have been—Iodides of cadmium and ammonium, 5½ to 6 grains. And so on for the rest of the experiments, arraying like salts and like combinations against each other. Mr. Blanchard would then have found his iodisers, without exception, superior to his bromo-iodisers in every respect, whether developed with pyrogallic acid or iron.

The greatest objection, however, to Mr. Blanchard's experiments is that, besides the displacing of the conditions between the iodisers and bromo-iodisers, one plate was used for both collodions—half for each—although the two sensitive mediums, being differently salted and of necessarily different ages, had different setting properties and different capacities for seizing silver from the bath.

My own *repeated* experiments, extending over a year, were made with about 160 ounces of collodion of one sample, manufactured by me with the best materials procurable, and the results were as follow, with one bath for each *series* or repetition of experiments:—

A. Cadmium-iodised collodion.—1. Superior in durability, sensitiveness, and equal in chemical intensity under iron development to the same with pyrogallic development.—2. Whether under iron or pyrogallic, superior in every respect to any bromo-iodised collodion developed with iron or pyrogallic—that superiority being reciprocally as the quantity of bromide present in the bromo-iodiser.

B. Iodide of cadmium 3 grains, iodide of ammonium 1½ grain, compared with iodide of cadmium 3 grains, bromide of ammonium 1½ to 2 grains—both under iron development.—The simply iodised collodion superior in every respect to the bromo-iodised reciprocally as the quantity of bromide present in the latter.

C. The same with the cadmium and potassium combinations, but with somewhat modified results from the difficultly-soluble character of bromide of potassium.

D. And in all cases of like combinations between cadmium and ammonium or cadmium and potassium, whatever the proportions, the *simply iodised collodion* was—1. Superior in every way under iron to the same under pyrogallic.—2. Under pyrogallic to corresponding bromo-iodiser under iron, *only when the amount of bromide was large.*—3. Under iron to the corresponding bromo-iodiser under iron, reciprocally as the quantity of bromide present.

Thus the iodiser had the superiority in every case, and the *cadmium-iodised collodion* stood first on the list with iron development.

I beg to point out, further, that the miscalled sensitiveness and durability of bromo-iodised collodion is not attributable to the bromides present, but simply to bromo-iodised collodion being compounded of alkaline and acid salts,—cadmium and ammonium, or cadmium and potassium; cadmium being the regulator of durability, sensitiveness, and density. If any doubts exist on the matter, let the following series of simple experiments be made in proof of the alleged excitation caused towards sensitiveness by the combinations referred to, and the inferiority of bromo-iodisers.

Take one sample of collodion and one bath for each case.

1. *For an Iodiser*—Iodide of potassium, 3½ to 4 grains.—*For a Bromo-iodiser*—Iodide of potassium, 3½ to 4 grains; bromide of potassium, ¼ to ½ grains.—Develop with iron or pyrogallic. The bromo-iodiser will be inferior to the other.

2. Try the ammonium salts similarly: the results will be identical.

3. Iodiser No. 1, iodide of ammonium, 4 grains. Iodiser No. 2, iodide of ammonium, 2 grains; iodide of cadmium, 2 grains.—The latter will be superior, by reason of the alleged excitation.

4. *Iodiser*—Iodide of ammonium, 4 grains.—*Bromo-iodiser*—Iodide of ammonium, 2 grains; bromide of cadmium, 2 to 3 grains.—The latter will be superior in every respect, by reason of the alleged excitation; but, when compared with iodiser No. 2 of experiment 3—compounded of like salts in like proportions—it will be inferior to it in every way.

5. The same as regards the potassium salts, under certain modified conditions as already noticed.

6. *Iodiser*—Iodide of cadmium, 5 grains.—*Bromo iodiser*—Iodide of cadmium, 4 grains; bromide of cadmium, 1 to 1½ grains.—The latter will be inferior.

7. Add to iodised cadmium collodion an equal quantity of freshly-*iodised* ammonium collodion: keep a short time: the composition will be superior to the cadmium collodion *for a time*.

8. Add to iodised cadmium collodion an equal part of freshly-*bromided* ammonium collodion: keep a short time: the composition will be superior to the cadmium collodion *for a time*, but it will be inferior in every way to the composition of the preceding experiments.

In other words, if the advocates of bromo-iodisers had compounded their iodisers of the same salts as their bromo-iodisers, and used them, their success would have been more constant than it has been. I am inclined to think these gentlemen chargeable with the origin of certain vexatious disappointments and failures among the toiling disciples of the art, caused by their fanciful theories, unfair illustrative experiments, and erroneous deductions.

Although there should be no doubts regarding the superiority of iodides, yet the use of bromide for absolutely instantaneous photography, from its better capacity for resisting solarisation in cases of strongly illuminated and dazzling subjects abounding with recalcitrant actinism, is indispensable—but *not otherwise*, nor *just now*, in the quantities said to be used; for, as the matter of this communication is intended to show, iodides have been erroneously underrated, the error having arisen through attributing the miscalled superiority of bromo-iodides to the bromides present, instead of to the combination of the salts used, which will at all times give *iodisers superior in intensity, durability, capacity to resist solarisation and sensitiveness, to any bromo-iodiser* that can be compounded with the salts at present in use, and with little or no injury to the silver bath.

I may mention here, *en passant*, that collodion iodised with equal parts of cadmium and ammonium, or cadmium and potassium, becomes exquisitely sensitive. I have fancied the latter the better, from its delicate definition and *crispness;* but it is not so permanent as the other, which is, besides, better fitted for iron developement, from its superior intensity.

The proportions of the salts and the conditions of my experiments having been stated accurately, it will be in the power of anybody to repeat them, as well as correct any mistake which may have been made.

I have already addressed the *Photographic News* on the present subject; but I did not detail my experiments fully, as I wished to make my letter rather argumentative than illustrative. In this letter I have put down everything I can think of; and, as the subject is one of an engrossing character, I hope you will permit me to be heard in the columns of your Journal.—I am, yours, &c., AUGUSTUS WEBB.

Meerut, N.W.P., India, 31*st July*, 1862.

ACARI IN THE NITRATE BATH.

To the Editor.

Sir,—As the subject of "*Acari* in the Nitrate Bath" is again mentioned in your Journal, I write hoping to throw some light on the subject, having met with them under very similar circumstances; and, as far as I have examined them, they appear exactly like the drawing published in your Journal, May 15th.

I did not see the letter from Dr. Maddox at the time it was published, or I should have written then.

In the spring of last year, on opening a glass bath which had been covered with an air-tight India-rubber cover for some months, I found them floating on the solution of nitrate of silver.

Others were on some distilled water in a corked bottle; but in both cases they were all dead, and it was not until I searched very carefully that I found any alive, as they are so small and colourless that they easily escape detection in the dark room, although very conspicuous when floating on any liquid.

In some of the cracks of the boards in the dark room (which had been used formerly as a harness-room) they were swarming, and had also over-run everything on the shelf on that side of the room.

They appear to die in a few minutes when placed on a drop of water, and I thought I had effectually got rid of them by washing the boards; but they have appeared again this summer, though not in such numbers as before.

About a fortnight ago I again found them in the same bath, which had not been opened for two or three months.

I have very little doubt but that the *Acari* discovered by Dr. Maddox might be traced to a like origin; for it is very possible that they crawled into the bath when open, and were not seen until they died and fell into the solution.

I shall be happy to send you specimens, if you would like to see them, and shall be glad of a hint how to get rid of them, as they have an extraordinary and very annoying propensity of committing suicide in any liquid that happens to be left open.—I am, yours, &c.

September 5, 1862. ARTHUR C. STERRY.

[We have no doubt that Dr. Maddox will feel interested in receiving specimens of your *Acari*, and we shall be happy to forward any to him that you may send. But we do not anticipate that they are identical with his, for, if you will again refer to his article, you will perceive that he found his specimens *alive*, floating on the solution of nitrate of silver; and further, that, after carefully washing them and treating them with iodide of potassium, there was so dense a deposit of iodide of silver *within the substance of the bodies* as to render them quite opaque, and, to prove opaque, they must have been thoroughly impregnated with nitrate of silver—a fact incompatible with their having but recently fallen into the solution: in addition to which, Dr. Maddox is too experienced an observer to mistake dead *Acari* for living ones.

With regard to getting rid of your plagues, we recommend you to make a good stiff lather of *soft* soap and carbonate of soda in pretty strong solution, and have the floor well scrubbed with that mixture.—Ed.]

THE DAGUERREOTYPE.

To the Editor.

Sir,—I have to thank Mr. Corey for the very kind and prompt manner in which he acceded to my request for information as to the manner of taking Daguerreotype pictures. I regret to find so few who profess or are capable of taking portraits by this delicate and beautiful process. Thanks to Mr. Corey, and others from whom I have received hints, I have succeeded in producing portraits which quite satisfy me—the rich transparency of the shadows and the pearly purity of the whites being such as I have rarely seen equalled. After practising it a short time I found a tendency to blueness in the whites. This I found to proceed from moisture in the iodine, and the way I cured it was as follows:—I procured some pieces of chloride of calcium, which, after thoroughly drying by exposure to the fire, I put into a shallow earthenware dish (an old bear's grease pot), and set inside the iodine box. This kept the iodine quite dry, and gave most delightful results.

Some of those American operators most celebrated for their brilliant pictures are said to have sensitised their plates with Gurney's American Compound. Can any one inform me how it is made?—I am, yours, &c.

MARY B——.

STREAKY SKIES.—REDUCTION OF WASTE.

To the Editor.

Sir,—Can you help me over the following difficulties?—

1. With a new bath, composed of thirty grains nitrate of silver and a quarter of a grain iodide of potassium to every 100 grains of silver, then filtered, and made slightly acid with nitric acid, I get good negatives, but *streaky skies*, and near the end of the development there is a blackening of two or more corners. I thought the black smudge at the corners might arise from dirty plates; but, after cleaning them with scrupulous care, and placing clean blotting-paper at the corners of the slide, the same kind of markings appeared. My developer was—

Pyrogallic acid	1 grain.
Citric acid	1 ,,
Alcohol	...5, and afterwards increased to 10 minims.
Water	1 ounce.

2. As Mr. Corey's plan of recovering silver has the great advantage of doing away with the forge, I tried it, and signally failed. I placed a piece of zinc into an old bath, and precipitated the silver with salt. The following day I poured off the fluid, and, to make sure that I was not throwing away my silver, I added salt to it, and there was no precipitate. To the bath I added salt and water four several times, and noticed that the precipitate was a light brown and slightly lumpy, and the zinc was coated with a black powder. I washed and baked it; then triturated with it an equal quantity of pearl ash. I placed this in a red-hot crucible, but no deflagration took place. After roasting some time I attempted to pour it out, but it was caked in the crucible. I poured hot water on the mass (a sample I enclose), but I could find no silver. What became of it? Among other things, I cannot understand the utility of adding salt after the silver has once been precipitated.

Will you have the kindness to help me to the solution of one or two of the above dilemmas.—I am, yours, &c. A DULLARD.

September 4, 1862.

[1. There is evidently something you must have overlooked in your operations, as there is not sufficient reason in what you have reported to account for the defects you name. Streaky skies generally arise from want of skill in keeping the developer well covering the surface of the plate, if they are not caused by dirty plates. Send us a proof from one, and we may be able to point out your error. Blackening of the corners rather indicates contact of the developer, &c., with the thumb of the operator. Possibly it may be caused by stagnation of the solutions at those parts: indeed the two defects combined rather point to the same cause—your not keeping the developer well in motion, and yet all over the plate. Perhaps you use too small a quantity of the solution.

2. There was no "sample" enclosed in your note. The account you give of this experiment reveals a want of care in conducting it, or else a mis-reading of your instructions. You are *not* directed by Mr. Corey to place the mixed precipitate and pearl ash into a *red-hot crucible*, nor is any deflagration described nor expected to occur. The crucible must be placed in *a furnace, and the heat raised until complete fusion takes place.* Of course you could find no metallic silver, not having reduced it. We can only advise you to read Mr. Corey's paper carefully again, and do so just before you intend operating. There is no use in adding salt when the silver has been precipitated, except to make sure that none is left behind in the solution; but even in this you have not acted quite as directed, as you will perceive on re-perusal of the paper, though the slight variation you have made is not very important. The object of the zinc is not entirely to reduce the silver to the form of oxide—which is a work of time—but to form a mixture of chloride and oxide which can be produced quickly.

Since writing the preceding, the specimen arrived in your second note. We find it to be chloride of silver mixed with pearl-ash. The weight of the powder gave presumptive evidence of a metallic base. Treated with dilute nitric acid and allowed to settle, a precipitate of chloride of silver was found. The solution gave no indication of containing any silver on the addition of a drop of hydrochloric acid—hence we infer that your mixture contained no oxide of that metal. On adding ammonia in excess, a cloudy flocculent precipitate of organic matter was formed, arising from the pearl-ash, of course. Lastly, a pinch of your mixture having been placed on a piece of coke, hollowed out to receive it, was submitted to the action of a gas-flame urged by the blow-pipe, when several small globules of bright metallic silver were formed.—Ed.]

PREVENTIVE FOR SOLUTION OF THE FILM.

To the Editor.

Sir,—As I have very frequently seen, in the correspondence of different photographic journals, amateurs and artists troubled with the collodion film being entirely taken off a valuable negative by varnishing with spirit varnishes, I beg to lay before them a very simple remedy for the prevention of this.

Take three or four grains of isinglass, or gelatine, and dissolve it in one ounce of water (six or eight grains may be used)—it is simply to form a size with—and, while the negative is still wet from washing after fixing, take two or three drachms of gelatine solution and run it over the plate. Let this dry, and varnish as usual.

It does not matter how old the collodion is. This prevents the spirit in the varnish from dissolving the film off. This may have been practised by more operators than one; but I have never seen it published in any journal; and if not, and this is made public, it will, I am sure, be felt a great boon to many operators and amateurs.

This is a precaution I never fail to take now, whether the collodion be old or new.—I am, yours, &c. A. WHITHAM.

Hollingworth Lake, Sept. 9, 1862.

[The use of albumen in the way described above is a very common practice.—Ed.]

MANIPULATING SKIES, &c.

To the Editor.

Sir,—I shall feel obliged by your explaining to me the undermentioned in your next number.

In your Journal of Jan. 1, 1861, Mr. Hughes, in his article on *Art-Photography*, speaks of Mr. Mudd's method of tinting skies. He says—"Mr. Mudd paints out the sky, and brings the black within a quarter or half-an-inch of the boundary of the landscape, and he afterwards softens off the black and leaves the sky to this extent to print through." Having several negatives in which the skies are very pale, will you kindly tell me if the black is to be applied to the front or back of the negatives. I thought of using the dead-black varnish. Will it do? and can I soften it off properly? and does it matter about the negatives being varnished? Am I to follow the shape of the outlines of the landscape when painting the black, or am I to carry it straight across?

Also please to inform me if it is necessary to exclude daylight when intensifying with pyro. and silver, *after* fixing with hypo.

I have been anxiously waiting for Mr. Breese to inform us how he obtained those beautiful moonlight stereoscopic transparencies, but he has not yet done so. I think I understood you to say, in one of your articles some time since, that he intended doing so.—I am, yours, &c.,

September 8th, 1862. AMATEUR.

[The dead black-varnish will do very well, and it should be applied at the back of the negative, consequently the being varnished or not does not affect it either way. You can soften off the outline by means of a tuft of cotton dipped in turpentine.

With regard to the form of outline, a moment's consideration would show you that to follow the outline of a very undulating line of demarcation between land and sky would produce a very inartistic effect. You should strive rather to suggest the idea of a natural horizon. Like all other good things in art, it requires some skill in application.

If you do not exclude daylight when intensifying, your solution very quickly becomes muddy, and is apt to produce stains.—Ed.]

ANSWERS TO CORRESPONDENTS.

*** Up to the time of going to press, we regret to say, the letter of our esteemed American Correspondent, Mr. Coleman Sellers, had not come to hand.

C. O. L.—Drop in a little sulphide of ammonium and note the result.

A. Harman.—Received too late for this number: will appear in our next.

S. Seale.—Your negative is very much under-exposed: we should judge that it requires not less than three times as long as you have allowed.

F. O.—Nitrate of lead and nitrate of barytes are the salts generally used in the preparation of proto-nitrate of iron: we find either as effective as the other.

Jas. Moody.—We really cannot again repeat what we have so frequently given at length, but must refer you to our back numbers. Mr. Corey's paper, recently published, is entirely practical; you cannot do better than carry out the instructions so broadly given.

A Subscriber at Present had better send his real name and address to the Publisher, from whom he may possibly obtain an explanation, provided that he possesses the common sense he professes to value. We decline paying any attention whatever to communications couched in such language as that of his note.

C. Robinson.—We cannot compliment you upon your discrimination. We will offer a piece of advice in return for your own, viz., "don't believe half what you hear;" and, in the present case, if you reject nine-tenths of the remainder you will retain more than is true. There is not the slightest foundation for any one of your suppositions.

Juvenis.—We recommend you by all means to commence with printing from a negative in preference to any other course. Buy, beg, or borrow one or two *good* negatives to work upon; and, when you have mastered the printing, you will be much better prepared for learning to take negatives. This is what we regard as the natural order of progress; and, should we ever write a manual, that is the course we shall adopt.

J. H. S.—According to Mr. Ponting, the proportion of iodide four grains, bromide one grain, is best for one ounce of *his collodion*. It would be impossible to predict certainly what would be the *best* proportion for another sample of collodion, but a trial would soon reveal the fact. You must remember that Mr. Hardwich does *not* lay down the rule that the quantities he gave are *best* under *all* circumstances. We gave you the best information we possess up to the present time.

W. G. G.—That described in volume VI., page 4, of this Journal, and next (or perhaps even better for paper prints) that in volume VII., page 6. You will find both descriptions and illustrations. We have both kinds in use to the exclusion of all others. Some years back we saw at Messrs. Horne and Thornthwaite's a refracting stereoscope for pictures of a larger size than ordinary, of about the dimensions you quote; but, in our judgment, there is no advantage in an increase of size, because by the use of appropriate lenses you can give, with the ordinary stereographs, the effect of *natural size*. We do not entertain the opinion that the alleged improvement to which you refer is real—it is a complication; and the fact is that, in practice, the error that it is intended to rectify is really corrected by an error in the opposite direction. However you will probably hear more on the subject, for the author of the proposed alteration will most likely contribute another article on the subject shortly.

A. H. W. (Leeds.)—The streaky stains in the prints received arise from the unequal drying of the paper after sensitising and before exposure. This is not an uncommon occurrence with very highly-glazed albumenised paper, the glaze appearing to have a repellent action on the nitrate of silver, causing it to run somewhat in streaks. It is desirable to suspend such paper by two corners, one being a trifle more elevated than the other, and attach a small piece of blotting paper to the lowest corner to assist off the drip; but, in addition to these precautions, it is advisable to glance at the paper occasionally while drying, and in case of the solution running into a streak, to wipe it out lightly with a piece of *new* blotting paper torn with rather ragged edges. The white feathery streaks we know well: they arise from some sort of capillary attraction immediately on putting the plate on to the dipper, and if you remove all the solution from the ledge of the dipper you will find the annoyance cease. We believe it to be in consequence of a peculiarity in the pyroxyline of which the collodion is made rather than from the cause you name, though, doubtless, that exaggerates the annoyance. It is possible that a little more alcohol in the collodion might remedy it; but we *know* that if you avoid bringing the lower edge of the plate in contact with the nitrate of silver solution until it is actually plunged therein, it will cure the defect.

☞ *All* Editorial *Communications,* Books for Review, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 175, Vol. IX.—OCTOBER 1, 1862.

Concerning Rapid and Instantaneous Exposures.—It is not a little amusing to those who have kept a sharp eye upon the various discoveries announced from time to time during the rise and progress of our art, to observe the little contests that occur occasionally between two or more experimentalists who have arrived at similar conclusions relative to some real or supposed advantage in manipulation, each one claiming to have been the originator thereof; but, with regard to such contests, it sometimes happens that neither of the disputants are really entitled to the honour claimed, and it is not impossible that this state of things may arise in consequence of some circumstance having aroused imperfect recollection of a happy suggestion by a third person, thrown out at some previous date, in anticipation of the time for its useful application. A case in point is now before the photographic world. Some remarkably fine instantaneous views of Paris were produced by M. Ferrier, and everybody sought for information about the means employed by the operator in effecting his object. A rumour got abroad that formic acid was used in the exciting bath, whereupon M. Mc-A. Gaudin published a somewhat caustic article demonstrative of the absurdity of such a suggestion: this brought out a disclaimer from M. Ferrier, with an explanation that he used formic acid in his developer, but beyond that no further information was afforded.

In the *Journal of the Photographic Society* for 15th July last, pp. 95 and 96, a communication from the pen of Mr. Henry Claudet was published, stating that the extraordinary rapidity with which a negative portrait group of Dr. Diamond and M. Laulerie was obtained was owing to the "substitution of formic acid for acetic acid in the developer." Certain printer's errors, affecting the formula, were introduced; but these were corrected in the following number of the same Journal, and, as corrected, the formula stands as follows, viz.:—A sensitising bath consisting of thirty-five grains of nitrate of silver to each ounce of water, acidulated with three drops of strong nitric acid to each pint of solution. The developer: twenty grains of pyrogallic acid to seven and a-half ounces of distilled water, one ounce of formic acid, and six drachms of alcohol.

It appears that a paper, descriptive of Mr. Henry Claudet's method of working, was presented by M. Balard to the Académie des Sciences, at Paris, and, at the French Photographic Society, a claim was put in on behalf of M. Ferrier to the honour of having introduced formic acid into the developer. Now, one thing is here pretty clear, viz., that M. Ferrier did not afford Mr. Henry Claudet the means of applying it advantageously, for the former studiously avoided giving any more information than circumstances compelled him to do, whereas the latter worked out the problem to a practical result, and gave the public the benefit of his experience.

But the best of the joke is, that neither M. Ferrier nor Mr. Henry Claudet are entitled to the honour of having first introduced formic acid as an accelerator into the developing solution, for this was done so long ago as 10th September, 1853, by Mr. F. Maxwell Lyte, through the pages of *Notes and Queries*, and also in the *Journal of the Photographic Society*, for 21st September, 1853 (in which last, by the way, there was an accidental erroneous quotation of quantities as intimated by Mr. Lyte subsequently).

As our readers will be interested in the formulæ given, we make the following extracts from *Notes and Queries*:—

"To make my collodion, I use the Swedish filtering paper, as recommended by the Count de Montizon, Mr. Crookes, &c., not so much on account of its superior properties, as the easier manipulation, and the greater certainty of obtaining a completely soluble substance. Having obtained a clear and tolerably thick collodion, take

Rectified spirits of wine	1 ounce.
Iodide of ammonium	45 grains.
Bromide of ammonium	12 ,,
Chloride of ammonium	1 ,,

Iodide of silver, freshly precipitated from the ammoniated nitrate, as much as the solution thus produced will take up—a small excess, which will settle at the bottom, will not signify. Nearly the same compound, one which is equally good, is produced as follows:—Take

Rectified spirits of wine	1 ounce.
Iodide of ammonium	50 grains.
Bromide of ammonium	12 ,,
Chloride of silver	5 ,,

Whichever of these two sensitisers is used, take one and a-half drachms, and add to every ounce of the collodion.

"Collodion thus prepared is *most* rapid in its action, giving a deep negative (with Ross's sixteen guinea lens, and the developing agent I shall hereafter describe) in ten seconds in clear weather, and instantaneous positive pictures, which may be afterwards darkened with the solution of terchloride of gold, in chloride of ammonium. It does not easily solarise, and, what is best of all, gives the most pleasing half-tones.

"I find it preferable, in taking landscapes, to rather increase the quantity of the iodide of ammonium, in order to give complete opacity to the sky; but, if the operator pleases, he may produce the most admirable effect with the above-named proportions, by painting in clouds at the back of the plate with Indian ink: and this latter plan is preferable, as the addition of more of the iodide lowers the half-tones.

"If more of the chloride than above specified be added, it will cause the plate to blacken all over during development, before the extreme lights are fully brought up.

"My developing agent is made as follows:—Take

Distilled water	10 ounces.
Pyrogallic acid	6 grains.
Formic acid	1 ounce.

The latter is not to be the concentrated acid, but merely the commercial strength. These, when mixed, form so powerful a developing agent, that the picture is brought out in its full intensity, almost instantly, while at the same time all the deep shades are quite unaffected, and the half-tones come out with a brilliancy I have never seen before.

"Another excellent developing agent is composed as follows:—Take

Distilled water	10 ounces.
Sulphuric acid	3 drops.
Protosulphate of iron	½ ounce.
Formic acid	1 ,,

The formic acid is also a most capital addition to the protonitrate of iron, and either this or the former liquid produce most brilliant positives, leaving a fine coating of white dead silver.

"The developing agents which are made with iron are very applicable as baths to immerse the plate in; and the formic acid, from its powerful deoxidising property, renders the iron salt more stable during long use and exposure to the air.

"The developing agent with the pyrogallic and formic acids will keep good a very long time, longer, I think, than that in which acetic acid is used, but cannot be used as a dipping bath.

"I find the formic acid which I obtain from different chemists rather variable in its strength. What I use is rather below the average strength, so that in general about six drachms of the commercial acid will suffice where I use one ounce; but the excess seems to produce no bad result.

"A great advantage of the pyrogallic developer which I recommend is that of its being able to be diluted to almost any extent, with no other result than simply making the development slower."

We think this thoroughly settles the question of priority.

The principal variation between the formulæ of Mr. Lyte and Mr. Henry Claudet is in the much larger quantity of pyrogallic acid employed by the latter, conjoined with the acidification of the sensitising bath with *nitric acid*, which no doubt obviates the tendency to fogging, and yet does not, according to Mr. Henry Claudet's experience, prevent the material shortening of the time of exposure: it appears, therefore, to be a legitimate improvement upon Mr. Lyte's original formula, and as such commends itself to the attention of photographers generally. In our own experience of Mr. Lyte's original formula we certainly found the advantage claimed as regards the time of exposure; but this was accompanied by so decided a tendency to fogging of the image that the gain in one direction was more than counterbalanced by the inconvenience described. *A priori*, we should hardly have anticipated that so large a quantity of free nitric acid as directed by Mr. Henry Claudet for the nitrate of silver bath could have been added without altogether counteracting the increased energy of the developer containing formic acid, and it never occurred to us to make the experiment for ascertaining this fact; which, although unexpected, is not altogether without precedent: *e.g.*, the bromo-iodised positive collodion, with an iron developer and silver bath, acid with nitric acid.

This brings us to another consideration that has been under discussion, the question of the accelerating or retarding effect of a bromide in the collodion. It will have been observed that certain skilful operators have given testimony in favour of the accelerating effects of bromides in collodion from their own practical experience; but, so far as at present appears, their experiments do not seem generally to have been conducted in such a manner as to form data for unquestionable conclusions, as pointed out in a letter from India, written by Mr. Augustus Webb, which appeared in our last issue. This gentleman has arrived at diametrically opposite conclusions, and asserts that the apparent acceleration is due to the combinations of the bases of the salts employed; and he regards the pure iodides as decidedly more sensitive than any of the combinations of bromo-iodides. But we are bound to point out that neither has this gentleman conducted his experiments, upon his own showing, in a manner that precludes question, as a reference to the more systematically conducted experiments of Mr. Ponting, as detailed in the current volume, page 337, will show. The suggestion of the advantage found, arising from the judicious (intentional or accidental) combination of the bases of the salts employed, we believe to be sound as regards stability of condition of the collodion, but not in any other way as respects actual sensitiveness.

Before concluding this article, as bearing some reference to the same or a kindred subject, we desire to make a few remarks relative to the practice of using the pyrogallic acid developer upon a wet collodion plate *before* exposure, in order to attain superior sensitiveness of the film. Our readers may have noticed a "Scrap" from a correspondent, a short time back, wherein he stated that, being in Mr. A. H. Wall's studio, he had seen that gentleman resort to the device, and we appended a note to the effect that we doubted that any real advantage was gained thereby, having long since made careful comparison to decide the point. With reference to this note Mr. Wall wrote to us as follows:—"I have been wondering whether, when you used the pyrogallic acid before exposure, iron developers were in vogue. I obtained a picture a few evenings since *with* it (pyrogallic acid), when, by giving the same exposure *without* it, two or three minutes previously, I could not get the ghost of an image. Iron developer; bromo-iodised collodion; bath, thirty-five grains nitrate of silver to the ounce of water; time, six o'clock p.m.; place, my glass room."

To this we replied that we did not use an iron developer subsequently to exposure, in addition to a pyrogallic acid one before, for the simple reason that we invariably found the image already developed on removing the plate from the camera; and the probability is that, had it not been so, we should have used more pyrogallic acid instead.

Those of our readers interested in the question now have, by Mr. Wall's particulars, the means of testing the accuracy of that gentleman's deductions, and we consider the matter worthy of a trial.

ON THE DELINEATION OF MICROSCOPIC OBJECTS BY PHOTOGRAPHY.*

By R. L. Maddox, M.D.

Photo-micrography, or the art of producing enlarged positive or negative pictures direct from microscopic objects by the combined use of the microscope with photography, although partaking of the value of each, has, unfortunately, a much less application than either. The giant strides of progress made by the parents have left their offspring, in the race towards perfection and usefulness, far in the rear. Laden with its childish toys and treasures, it climbs a narrow path; constrained to walk when they run—to stop when they advance. No precocity marks its growth. Slow its steps, it clings to friendly hands, and hastes for shelter, in the threatenings of opposition or adversity, where "proud science" finds a home.

Thus, indebted to their union for its existence, it claims indulgence for its infant weakness and encouragement in its childhood from those who so largely enjoy the amusement and instruction afforded by both. Had photo-micrography received greater attention from men of science, it would have been more appreciated by the public. The voice that cries "Give, give," doubtless would have had its wants satisfied, and, with the call, there would have been a responding effort to ensure patronage and popularity. For several years it has raised a gentle appeal, and asked to be welcomed with its kindred. It has also sought a settled place in the hand-books of science: yet where are we to search its history? Chiefly in the pages of the journals. Of the few who have welcomed its birth, and furnished instructions for our guidance, we have the familiar names of Reade, Hodgson, Shadbolt, Delves, Highley, Wenham, Traer, Kingsley, Parry, and, more recently, Bockett and Smith. Across the Atlantic it has enlisted the skill and knowledge of Professor Rood. In France, several years back, Dr. Donné urged its claims; and I then saw exhibited some beautiful engravings of physiological studies, produced from his daguerreotype plates. My friend, M. Nachet, Jun., about three years since, showed me some well-executed prints of opaque objects. Latterly, we find M. Bertsch its advocate, and M. Neyt plying us with ingenious means for pourtraying the wonders of infusorial life. No doubt there are many others, either directly or indirectly, to whom we are likewise indebted, and I would gladly mention their names did they occur to me.

We might almost feel tempted to suppose that from so neglected a subject there can be now little to claim further attention; yet, as the sum of our knowledge is the united testimony of the experience of others, and this, alas! only the "knowledge of human ignorance," the communication of a few details may avail to help our onward path, where difficulties are rather in proportion to the images produced than to the objects delineated—the common stock so scanty, and the patrons few.

The immeasurable interest opened to the student of nature by the microscope—whether relating to the structure of living bodies, or the framework of such beings as remain from the "untravelled regions of the past;" whether as touching the beauties of life, before or after the "dishonours of the grave," "where mortality's cumbering vestments" unfold their changeful life; or whether as watching those elegant structures that daily press upon his attention, and lead him to almost exclaim, "Surely, here begin the 'suburbs of creation!'"—there stands, confessedly, a field of inquiry and research of such magnitude that, ere the borders be passed, so far and wide extends the view, he becomes painfully conscious of his feeble progress, and humbled at each step sees in the vast expanse that "Nature all o'er is consecrated ground."

* Read at a meeting of the North London Photographic Association, Sept. 17, 1862.

As we multiply our means of research, by so much the more do we increase our labours to unfold the concealed wonders of creation. Those who have patiently attempted to copy some of the objects that adorn the pages of scientific and popular literature, and who have earned for themselves a deservedly wide-spread fame, can alone tell us of the close attention, skill, and care required to convey little more than a general outline of the beauties presented to the eye of the microscopist. Any plan, therefore, that will help us to record our progress, or by which we can endeavour to facilitate the representation of such objects, or that by a little perseverance can obtain for us a more or less faithful transcript of our studies, possesses a value to be estimated by its application, and, if only for *merits of its own*, claims an impartial trial. Consistent, then, with these views, permit me to ask your assistance to further this humble endeavour, by making, for mutual benefit, any remarks the imperfect sketch I have now the pleasure of bringing to your notice may tempt you to offer. I come before you as a student seeking information, and with, in return, little that can be new to yourselves: hence are requested your kind indulgence and charitable criticism.

Why, then, has this neglected study not more largely joined issue in the great struggle for popularity? The answer has been in part anticipated. Still there remain several reasons which require a brief notice. United they gather strength. The disadvantages arising from the very perfection of the microscope as an optical instrument, when pressed into the service of photography, are so apparent, that we cannot expect the optician to withdraw his attention from its legitimate rivalry to suit our requirements. We accept, therefore, the instrument as he furnishes it. Complying with its limitations, let us not demand more than they will afford, and we shall still find a pursuit of extensive application. By a little ingenuity and perseverance, tempered with much patience, we must endeavour to remedy the defect his masterly attainments introduce; hence let us choose such objects as may enable us to appreciate his labours.

Since the study of the *Diatomaceæ*—units beautiful in symmetry and proportion, gathered from the fragments of past ages, marvels in the magnificent universe, with their wonderful markings—has urged forward every attempt to construct object-glasses which have "led us deep in the disclose of fine-spun nature," and detected structures so "exquisitely small, and, though demonstrated," they are still matter of dispute; yet such perfection, with the facilities for suiting the eye to the surface examined, is witness to the advance made in late years to object-glasses with a large angular aperture—that is to say, admitting so many oblique pencils that the shadows and interference from elevations and depressions become apparent to the eye—lines and points rendered visible which, with an object-glass of less aperture, would not at all, or only faintly, be distinguished. So perfectly are these lenses constructed, that they require parts in focus to be in one plane; yet where this does not happen the eye, by focussing, is furnished with the means for studying the character of the near or distant surfaces with little loss of time.

These advantages, unfortunately, do not equally and easily obtain when they are employed in photography. Again: the skilled optician has left us with an object-glass slightly over-corrected for colour—that is, which projects the blue and violet rays of the spectrum beyond the others, with which united they form white light, and by which arrangement the chemical focus is lengthened, placed behind, and consequently farther from the object than the visual focus, his aim being to compensate for the under correction of the eyepiece and present structures to the eye free from coloured edges. Here, then, supposing the spherical aberrations of the object-glass to be corrected—that is, the central and marginal pencils to be equally perfect—our difficulty commences, and we are necessitated to use those means which meet our requirements without detracting from the optical value of the lens employed.

Those who have engaged in the pleasing occupation of photo-micrography have generally adopted plans suited to the instruments at hand. My own differs slightly from all, at least in one or more particulars. The instrument may be simply described as a small travelling microscope, selected *not as the most convenient*, but the best spared. This is fixed by a screw foot in the centre at one end of a long stout board, and then bent on its axis parallel to the surface of the wood. This board is supported at some distance from its centre on three double, strong legs. The mirror is removed, and one of Abraham's achromatic prisms substituted. The stage slides along the support of the microscope, and carries a revolving disc or diaphragm with a tube screwed to one of the apertures. In this tube slides another, carrying a Coddington lens. The slide of the stage has a traversing motion by tangential screws. The arm carries adapters to receive different objectives. A fine screw, with graduated milled head, surrounded by a spiral spring, passing through the axis of the body or pillar, and acting on the arm, forms the slow motion, while the coarse adjustment is made by altering the position of the stage. One-half of the microscope tube, which unscrews in the middle, projects from the near surface of the arm: this is at once received into a wide, stout card-board tube, lined with dull black paper, through one end, closed with a centrally-pierced cap of leather. This tube is divided into two parts, having a telescope motion, connected together by a sliding joint made to fit on one, and carrying from *its* edge a thick circular flap or ring of black cloth, which passes over the end of the other tube, and effectually closes the telescope part against the admission of light. At this juncture a diaphragm can, if needed, be introduced. The other or near end of the card tube is fixed on the brass tubing of a half-plate portrait combination, the lenses being removed: this fits to the front of a camera, and between the front and back part of which is a collapsing portion. A long screw unites the sliding body to the other for the facility of ordinary use in focussing; and the parts of the camera are kept central with the microscope by wooden guides at the sides. The front portion or body of the camera can be fixed beneath by the screw that belongs to the ordinary triangle. A thick velvet collar slides on the microscope tube, up to and against the leather cap, to shut off the entrance of any light.

Let us suppose an appropriate object selected. It is first, *if not well known*, carefully examined with the compound microscope and the object-glass to be employed; the corrections for the thickness of the glass cover made, if needed; and some part in view selected as that furnishing the best general idea of the object. It and the objective are then removed to the micro-camera, centred, and focussed. Now becomes apparent the value of the prism, which is so turned (using direct sunlight) as to obtain, when looking on its surface, an image of the object-glasses carried back by the Coddington lens. When these are included in the sun's image, and the illumination in the glass screen is perfectly equal, a very minute alteration of the prism sends the rays obliquely to the Coddington lens and to the object. The screen is again examined, and if the character of the image shows the shadows to be too great, the prism is again moved until it furnishes a good general appearance. This slight movement often brings suddenly into view a fine line or some markings not previously noticed. The image is now viewed with a moderate magnifying power, fixed in a tube, so that its focus corresponds to the far side of the greyed glass. A difficulty sometimes meets us here that is very troublesome when the weather is cold. We often require to go fairly over the entire image with the eye, and if this occupy any time the breath is apt to condense on the near side of the screen, our view is rendered imperfect from the refraction caused by the vapour, and the lines appear confused. This especially happens when the covering cloth is drawn close to exclude light. So troublesome did I find this at one time that I entirely set aside the aid of the magnifying lens, and trusted to the eye suddenly catching some fine marks or lines. The Coddington lens I have employed, not for any optical value it possesses over an achromatic lens, but from its construction as part of a sphere I find it gives a very equal illumination, and is less likely to be injured by the heat rays in the focus of the prism. It naturally lessens the effective optical angular aperture of the high powers; but I do not find this a disadvantage. The prism is placed at such a distance, when used with the Coddington lens, that its focus would just pass the surface of the object were it used alone. In this way it fills the condenser; but if used without the latter, which is occasionally the case, I prefer the rays to have crossed before reaching the surface of the object, as there is less chance of their injuring the objective by loosening the medium used in cementing the lenses.

This brings us now to consider the second part of our subject, and in which I may also differ a little from others. Of the various plans I have adopted for the last three years, I have felt most satisfied when using a *slow* collodion having a tough structureless film, and which will often enable me to give several seconds' exposure. The collodion was made from linen, and added to a cotton collodion in the proportion of three or two to one; iodised with iodides of cadmium and ammonium two grains each, and one grain bromide of cadmium to each ounce. The bath, forty grains of nitrate of silver to the ounce of water, slightly acid, with nitric acid. The developer, the usual fifteen grains of protosulphate of iron solution (to which I occasionally add two grains of acetate of soda) to

the ounce of water: with this collodion the ordinary two-grain pyrogallic acid mixture is quite inefficient. When developed, the plate is washed, cleared with hyposulphite of soda, and strengthened with the pyrogallic developer, containing a little silver solution: then rewashed, and treated with a weak mixture of iodine and iodide of potassium; washed, and if necessary followed by a two-grain-to-the-ounce solution of bichloride of mercury. If the appearance now under a *magnifying lens* be satisfactory, the plate, after rinsing, is covered with a weak and old hyposulphite of soda solution, then flushed, after washing, with thin mucilage; if not satisfactory it is further treated with a solution of chloride of gold, followed by a weak, then by a stronger, solution of hyposulphite of soda. Structures will now sometimes become beautifully bright and evident. The plates are then well washed, gum-water flowed over the surface, and set the plate aside to dry. Without some adherent medium the film is apt to crack and peel from the glass.

This leads us to the third point, viz., the printing. The paper (Rive or Saxe) is floated on an eighty-grain solution of nitrate of silver, slightly acid with acetic or nitric acid, for five minutes; hung up to drain in the dark, and when surface-dry placed in a lined box on a well-heated flat stone, and the box closed by a thick paper cover.

Impressed from the negative the prints are floated printed surface downwards on rain-water for ten minutes or so, then removed, the surface smoothed with a glass rod and floated on common water for the same time, raised and the surface wiped as before; then plunged into a dish of common water containing about thirty grains of acetate of soda to the pint. Here they remain any moderate time, and after draining are toned in a neutral chloride of gold solution, made tepid by supporting the dish over steam. They are now washed and fixed in the ordinary hypo. solution. The after-washing is by often flushing and close draining for the first hour, then soaking, and often changing the water for four or five hours.

We are now prepared to take a brief survey of the facilities offered by the above arrangement. A long eye-piece, which I do not at all object to, can be placed in the microscope tube either before or when the remaining half of the tube is secured to that in the arm. The magnitude of the image being equal, but perhaps a little less defined, the apparatus is thus made much more compact.

The attempt to use slightly oblique light for the purpose of producing more distinctly the shadows would, if the card tube were not of some dimensions, risk fogging, by being consecutively partly reflected towards the sensitive plate, and especially if there were not a diaphragm situated towards its near end. There is considerable difficulty in managing this carefully: many of my negatives have one side of the plate beyond the ring fogged from this reflection. The use of a rather non-sensitive collodion gives more time for the light to bring out the surface markings, and obtain a more pearly character of the objects *(Diatomaceæ)* when printed.

The specimens that accompany this paper are all untouched and unpressed: they are sent to simply illustrate the method adopted, and to prove that photo-micrography deserves more encouragement. Some objects—as the small black fly or blight, the sand-hopper, the *Entomostraca*, the spiral and woody structure of boiled asparagus, the fibre cells of the bog-moss leaf—were simply mounted without preparation, beyond gentle washing in the ordinary gelatine and glycerine medium: the two latter are sent as illustrations of employing an unsuited lens of too high magnifying power. There are other prints where the error is on the opposite side, as in the *Arachnoidiscus*, which will not permit of printing without some confusion. The negative bears considerable amplification, though the paper will not receive the image perfectly. When magnified it is curious to observe the apparent hollow depth the converging or diverging *radii* give to the disc. The *Zygnema* was simply placed in a cell with a little glycerine water.* I avoid, if possible, animal structures that have been treated with caustic potash: their brown colour renders it tiresome to obtain an idea of the natural colour of the object.

The stereo. prints of the brittle star were made, one pair by slightly elevating and depressing alternately the slide, the object remaining central, and taking a negative of each position on a stereo.-plate—suggested, I think, by Professor Wheatstone (*Journal of the Microscopic Society*, No. IV.) I have also tried the plan mentioned by Mr. Wenham, in his paper *On Binocular Vision* (*Journal of the Microscopic Society*, No. VI.), of covering one-half of the object-glass, taking a negative, then reversing the mask and taking another negative—a method, I believe, lately much advocated by Mr. Smith, and exceedingly valuable. I find in deep structures, especially those consisting of carbonate and phosphate of lime, the light somewhat deficient when illuminated by a side light. It is rather improved with the Lieberkuhn. The stereo.-print of what I suppose to be a parasite of the brittle star, was taken by the employment of this reflector. In some of the prints —*vide Anchor Spicule of Synapta*—various wave-like markings are seen round one or more of the edges of the object. On what do these troublesome appearances depend? I think they exist in the medium in which the objects are mounted, and are more evident when an appreciable interval lies between the under surface of the glass cover and the surface of the slide. They are visible at times on the focussing-screen. This is only an opinion, and will bear correction. Are they due to the "diffracting spectrum?" and can they receive the explanation given by Mr. Wenham on this point, in the *Journal of the Microscopic Society*, No. VII.? They occasion some disfigurement which, naturally, we should be glad to prevent. The prints will prove that with care we can render photo-micrography available in obtaining a general or more or less perfect resemblance of appropriate objects; and I feel convinced, were we in possession of the facts our united labours furnish, they would offer some encouragement to overcome the difficulties, and raise to a distinct position this branch of combined science and art—of course always mindful, as I before said, *not to attempt nor expect too much*. Of the various object-glasses employed I have said nothing: they range from three inches focus to one-seventh, are by different makers, and very variable applicability. The correction is made by either withdrawing the object-glass from the object the amount of distance required, or by a lens placed behind in the setting of the objectives. Nor have I ventured to touch on the subject of using "dark ground illumination," polarised light, coloured media, artificially-coloured light—all of which some time since received my attention, but without any very definite or satisfactory solution; nor of enlarging from small, delicate, and perfect transparent positives.

I here beg to acknowledge any assistance I have found from the writings of others. Give fairly your kind criticism to these remarks, and to the specimens placed for your examination; and permit me to hope that we may, with your assistance, receive mutual advantage—e'en though it rather "humble than elate"—and in the vast spreadings that lie before us see and feel convinced that "the Great Proprietor's all bounteous hand leaves nothing waste," but bids men "passing, perchance in haste, to pause and think of Him who made them."

* The print of the *Scalariform*, duct and dotted cells of *Maeca* or *Racca*, is from a dry plate.

STEREOSCOPIC PICTURES OF A LARGE SIZE.

By Professor Edwin Emerson.

In a recent article upon *Relief*, in *Silliman's Journal of Science*, I have already briefly mentioned an experiment recently made by me in uniting, stereoscopically, much larger pictures than those usually prepared for the stereoscope. Since my arrival in England, I have thought it would be of some interest to the readers of The British Journal of Photography to give an account of my experiments on this point more in detail.

Theoretically there ought to be no difficulty in uniting very large pictures; but practically there seems to have been very great difficulty experienced in the effort to accomplish it. I have myself met several scientific gentlemen who have assured me that they have tried it, and consider it impossible. Mr. Forrest, of Liverpool, informed me that it had been attempted there, but did not succeed. As the first experiments made by myself, more than a year ago, left me in great doubt as to the feasibility of the matter, it may be that, in the cases above referred to, the experiments were performed in an improper manner, or that the conditions essential to success were not fulfilled.

With a good magic lantern very beautiful results have been produced by using a single glass picture as a slide: as the perspective and light and shade are almost perfect, it is not surprising that ordinary observers have imagined that they saw pictures having relief. But those who understand the philosophy of the stereoscope know very well that there can be no real relief in such pictures. Some of the experimenters above referred to endeavoured to remedy this defect by the obvious addition of another magic lantern exhibiting the complementary view, but were disappointed in getting satisfactory results—partly because the pictures were thrown upon the screen at too great a distance from each other to unite them readily, and partly because the edges of the pictures, at the line of union, overlapped each other and obscured more or less of the details; moreover, they found ordinary glass trans-

mitted positives not well adapted for reproduction in this way, being too much developed.

In my own experiment I prepared a glass stereograph of such dimensions that both the right and left pictures could be exhibited by means of a single magic lantern. To do this each picture on the glass was reduced to the diameter of about one inch and a half; in other words, the two complementary pictures were so reduced as to fill only the space usually occupied by one alone. Of course great care was taken to have these pictures perfectly sharp, and not too much developed. Upon endeavouring to unite the images formed upon the screen, by means of prisms held to my eyes, and properly adjusted, I found that there had not been sufficient separation of the lenses of the camera, in taking the negative, to enable me to get any decided stereoscopic effect. That amount of separation between the lenses of the cameras which is quite sufficient for the production of ordinary stereographs will not answer for the purpose of obtaining enlarged stereoscopic views. Having learned this, I began *de novo*, by taking a negative of a view just out of my window, with a separation of ten feet between the tubes of my camera. From this negative I obtained my double positive of the dimensions requisite for the single magic lantern; and, upon throwing these pictures upon the screen, I had no difficulty in uniting them by means of the prisms, and thus getting a beautiful stereoscopic effect. My friend, Professor Rood, who had kindly assisted me in this experiment, afterwards made some stereographs of geometrical figures of the proper size for exhibition in a similar manner, in which the stereoscopic effect was singularly distinct.

The prisms used to unite the pictures had *plane* surfaces, and the angle included by the inclined surfaces was about 20°. The dimensions of the enlarged pictures will depend upon the power of the magic lantern which may be used. In the case described the dimensions were six feet each way.

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.*

By Emerson J. Reynolds.

SPECIAL RE-AGENTS.

Nitric Acid *(Aquafortis)*.—This acid should be free from non-volatile matter, and hydrochloric and sulphuric acids, which are tested for in the same manner as in ascertaining the purity of water. Dilute one part of the strong acid with three or four of water.

Sulphuric Acid (Oil of Vitriol).—This test frequently contains both lead and arsenic: the former is deposited in the state of sulphate on diluting the acid with water, sulphate of lead being less soluble in dilute than in concentrated sulphuric acid. The arsenic may be detected by diluting the acid with water and boiling it with a clean piece of copper wire: if a steel-gray coating be observed, arsenic is present.

Tartaric Acid is generally sufficiently pure for use. Dissolve one part of acid in two parts of water. This solution should be prepared as wanted.

Nitrate of Ammonia.—Neutralise concentrated nitric acid with ammonia, and evaporate the solution to dryness; then break up the mass, and preserve for use.

Ferrocyanide of Potassium (Yellow Prussiate of Potash).—Dissolve one part, by weight, of the salt in twelve parts, by measure, of water.

Protochloride of Tin.—Dissolve some tin in hydrochloric acid, taking care, however, that some of the metal remains undissolved; then decant, and preserve in a well-stoppered bottle. When required for use it must be diluted with water, and a few drops of nitric acid added.

Caustic Potash.—This alkali, as usually met with, is generally impure; but it is easily prepared in a pure state by powdering the commercial article, and dissolving as much as possible with strong spirits of wine. Then *decant*, and evaporate the solution in a clean *iron* dish until it begins to flow like oil; then pour it out on a slab, and, when solidified, break it up, and preserve in a stoppered bottle. Dissolve one part of the solid hydrate of potash in twelve parts, by measure, of water.

ANALYSIS OF THE BASIC GROUPS.

We shall now enter on the study of the detection and separation of the individual members of each group. For the sake of greater clearness in detailing the method to be pursued, as well as to avoid repetition, which our limits would not permit, we shall suppose that the precipitates produced by the several general re-agents contain all the members of which they can consist.

* Continued from page 347.

We will commence by examining the first group.

First Group.—Collect the white precipitate produced by hydrochloric acid on a filter, and wash with cold water. On referring to our list of the basic groups, we see that the precipitate may contain *silver*, *mercury*, or *lead*—one or all. We will suppose that the latter is the case. Now pour boiling water repeatedly over the mixture on the filter, and to the liquid which passes through add a drop of *sulphuric acid*. If lead be present, a white precipitate is produced of sulphate of lead, which, under the circumstances, is characteristic of that metal; and so we have disposed of *lead*. We now pour *ammonia* over the residue, which immediately becomes almost *black*: this indicates the presence of *mercury*. Then add nitric acid in excess to the filtrate and observe that a white, cloudy precipitate is produced—demonstrating the existence of *silver*. Such is the simple mode of analysing the first group. We will now explain the *rationale*.

When the boiling water is poured over the mixture of chlorides, the chloride of lead is dissolved out and found in the filtrate. When we pour ammonia on the residue, it decomposes the calomel, taking away the chlorine and leaving the grey or suboxide of mercury on the filter: at the same time it dissolves any chloride of silver (which is largely soluble in ammonia), and, on neutralising the alkali with nitric acid, the silver compound is thrown down.

The following table gives, in a concise form, the method to be pursued in analysing the group:—

Pour boiling water repeatedly over the precipitate.

	The residue may contain mercury and silver: wash with ammonia	
The filtrate may contain *Chloride of Lead*. (Test with sulphuric acid.)	It becomes black. Present, *Subchloride of Mercury*.	The filtrate may contain silver. Add excess of nitric acid. A white curdy precipitate appears. Present. *Chloride of Silver*.

Second Group.—It will be remembered that the second group is subdivided into two sections, one soluble and the other insoluble in sulphide of ammonium. The solution of the first section in the alkaline sulphide must be precipitated by adding a slight excess of hydrochloric acid, and the resulting precipitate thoroughly washed. The portion which is insoluble must, likewise, be washed and preserved for further examination.

First Division.—The first point to be attended to is the colour of the precipitate, which, if dark, must be examined for all the members; but, if of a full yellow tint, we need not examine it for either *gold* or *platinum*. Again: if of a light yellow colour, it is highly probable that *antimony* is absent; and, finally, when it is yellow, and, heated on a fragment of porcelain over a spirit-lamp, if no residue is left, *tin** cannot be present. By paying a little attention to these physical appearances we can often form a very good general idea as to the nature of the substance.

If either gold or platinum is present, we must take a little of the original solution and dilute it, if necessary, then place it in a test-tube, and, having moistened a glass rod with solution of protochloride of tin, it is to be gently lowered into the liquid in the tube: if a *blue* or *purple* streak is observed in the track of the rod, *gold* is present. This mode of applying the test is very delicate, and will, doubtless, be of use to photographers. To discover the existence of *platinum*, we take a little of the original solution, which, if dilute, must be concentrated by evaporation, then add some hydrochloric acid, and, finally, a few drops of solution of *caustic potash* and a little spirits of wine: if, after some time, a canary-yellow-coloured precipitate is produced, *platinum* is present. The test for gold depends on the production of the "purple of Cassius" with protochloride of tin. The precipitate produced with platinum is a compound of bichloride of platinum with chloride of potassium, which is soluble to a small extent in water, but is much less so if alcohol is present, hence the addition of the latter. We must always be particular, in testing for platinum, to have the hydrochloric acid decidedly in excess. Having disposed of gold and platinum, we now turn our attention to the separation of the remaining members of the group—*arsenic*, *antimony*, and *tin*.

The mixed sulphides are placed in a test tube, and a dilute solution of *carbonate of ammonia*† shaken up with them for a *few seconds only*, and then rapidly filtered off: the filtrate contains the arsenic, and the residue antimony and tin. Now add excess of hydrochloric acid to the filtrate, and pass sulphuretted hydrogen, which will

* Even though the tin was thrown down as the lower sulphide which is *black*, it is converted into the higher sulphide, the colour of which is *yellow*, after solution in sulphide of ammonium.

† This solution is prepared by dissolving one part of the solid *carbonate of ammonia* in twelve of water.

produce a precipitate of sulphide of arsenic, if any of that metal exist in solution.

We must now examine the residue for the two remaining metals. For this purpose we take a small porcelain crucible and place in it a little *nitrate of ammonia*, then heat the crucible over a spirit-lamp until the salt melts perfectly. When in this state, throw in some of the residue in a dry state, and continue the heat until a dry infusible mass remains. Now digest the latter in a strong solution of *tartaric acid*, and filter: the filtrate contains the *antimony* only, which may be precipitated by sulphuretted hydrogen, and the residue tested for tin with the blowpipe in the manner to be described hereafter.

We may now give our usual *resumé*:—

If the precipitate be dark-coloured, test the original solution for gold and platinum; then agitate with a few drops of dilute solution of *carbonate of ammonia*, and decant or filter.

Filtrate may contain *arsenic*. Super-saturate with hydrochloric acid, and pass sulphuretted hydrogen. If a yellow precipitate be produced *arsenic* is present.	The residue (if any) may contain *antimony* and *tin*; fuse with nitrate of ammonia, and, when all fuming ceases, digest the remaining mass in a solution of tartaric acid, and filter.
	Filtrate may contain antimony, pass sulphuretted hydrogen. An orange-coloured precipitate indicates antimony. / Residue: Tin, (Examine with blow-pipe).

Second Division.—Let us now examine this division. In the first instance, if the precipitate be of a yellow colour, and not dissipated by heat, it can only be *cadmium*, which may be thus easily detected in collodions by the use of the general re-agent alone. If it be of a dark colour, however, we must search for all the members. To accomplish this, proceed as follows:—Boil the precipitate with strong nitric acid: if a black residue remain insoluble, *mercury* is present—since sulphide of mercury is insoluble even in boiling nitric acid. Now decant, and evaporate the liquid until nearly all the acid has been expelled, and add a drop of *sulphuric acid:* if a white precipitate be produced, *lead* is present. Then filter, if necessary, and add an excess of *ammonia:* if a white precipitate be produced, *bismuth* is present. We now have remaining in solution *copper* and *cadmium*, to separate which we must evaporate the liquid nearly to dryness. Add hydrochloric acid, and divide into two portions. To one of these we apply a drop of solution of *yellow prussiate* of potash: if a mahogany-coloured precipitate be produced, *copper* is present. To the second we add excess of *carbonate of ammonia*, and warm the mixture: the production of a white precipitate indicates *cadmium*. We may likewise remark that, if the ammoniacal filtrate have even a slight tint of *blue*, the presence of copper is certain.

The general plan is as follows:—

Boil precipitate with nitric acid: a *black* residue indicates *mercury*. Filter, and expel excess of nitric acid by boiling, then add the *sulphuric acid*, and filter again, if necessary.

	To the filtrate add *ammonia* in excess.		
A white precipitate appears: *Sulphate of Lead.*	Precipitate *Oxide of Bismuth.*	Evaporate nearly to dryness, then dissolve in hydrochloric acid, and divide in two portions.	
		1. If the solution have a *blue* tint, *copper* is present. (Confirm with yellow prussiate of potash.)	2. Add excess of *carbonate of ammonia*, and warm: if a white precipitate appear, cadmium is indicated.

In our next article we shall finish the analysis of the basic groups.

THE PHANTASMASCOPE.

By Coleman Sellers.

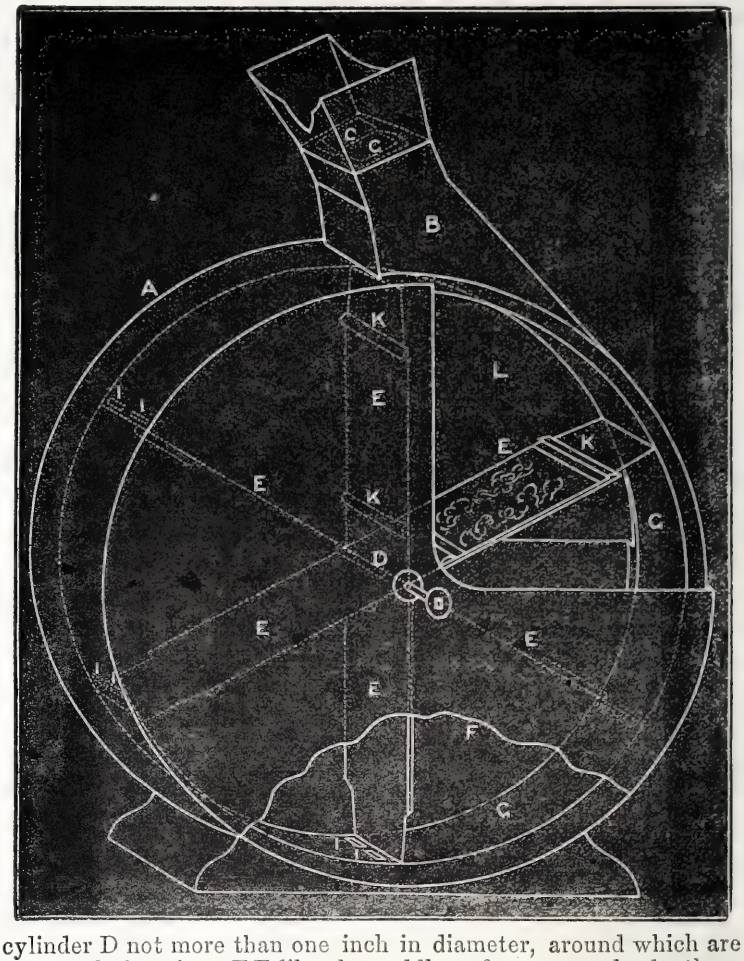
The following is a description of an instrument designed and patented by me in the United States of America, on the 5th Feb., 1861, for the exhibition of stereoscopic pictures of moving objects, and which has not been brought before the public either here or abroad.

For about one year previous to the issuing of this patent my attention had been directed to the construction of an instrument which should present stereoscopic pictures in succession to the eye, so as to combine stereoscopic relief with the semblance of motion.

Many models were made, having the pictures arranged around the outside of a cylinder, and some curious devices, with a view to effecting the interception of view in the best manner, were applied; but with all of them it seemed inevitable that, as the picture was passing across the axis of vision, there must be a slight apparent blurring of the outlines of the photograph, no matter how small were the openings through which they were viewed. Thus, if the openings were one-sixteenth of an inch wide, the picture could be seen during motion through that space, and, consequently, a provoking indistinctness seemed a necessary consequence of the arrangement. Finally, however, a new principle was hit upon which may be illustrated by the relation of a simple experiment.

If a stereoscopic picture be held before the eyes by one corner, and it then be moved rapidly backwards and forwards in its own plane, and at the same distance from the eye, it will be impossible to see the picture at all; but if it be moved just as rapidly to and from the eye, within a limited space, the picture can be seen during the whole period of motion. This determined the form of instrument patented at the time above-mentioned. It consists of a

FIG. 1.



cylinder D not more than one inch in diameter, around which are arranged six wings E E like the paddles of a water-wheel: these wings carry the stereographs. Around the outside of these wings passes a band of tin G four inches wide, through which are cut slits I I one quarter of an inch wide and one inch long each, the centre of each pair of slits being three inches apart. These slits are close to each of the wings, and immediately at the back of each picture, so that through the slits may be seen the picture on the face of the next wing. The lenticular stereoscope C C affixed above this paddle-wheel arrangement combines the pictures as they pass in succession before the eye. The whole of each picture cannot be seen at one time; but, according to whether you turn it to or from you, the picture is seen at its lower or upper edge first, and then the vision passes over the card, which has scarcely gone before another one is presented to view. The pauses between each picture is hardly perceptible, even during a slow rotation; and, as the pictures are seen as they advance towards the eye in the line of vision, the most minute detail can be examined with care, and the semblance of motion is wonderfully well conveyed. This is contained in a series of slides showing a lady seated in a rocking-chair, facing the observer, and rocking towards and from him. The pictures, out of the stereoscope, seem all alike, but in the instrument above described the motion is very life-like indeed.

Subjects the best suited for exhibition in the phantasmascope are those in which the motion is a reciprocatory one—such as sewing, fanning, turning over the leaves of a book; and with six wings to the revolving wheel, three negatives will give the complete motion, in the following order—assuming, as an example, a gold-beater pounding with his heavy hammer:—Three pairs of pictures are sufficient for the two extremes of the stroke and one intermediate position,—printing two from each of these positions, and calling

them in their order, *Up*, No. 1; *Part-way Down*, No. 2; and *Down*, No. 3. They are arranged in the wheel thus:—two pairs of No. 1, then one pair of No. 2; next two pairs of No. 3, and then one pair of No. 2. This arrangement will give a "dwell" at each end of the stroke, and the intermediate picture each way fills the void in the strokes, and makes it appear more natural than it would be with only the two extremes.

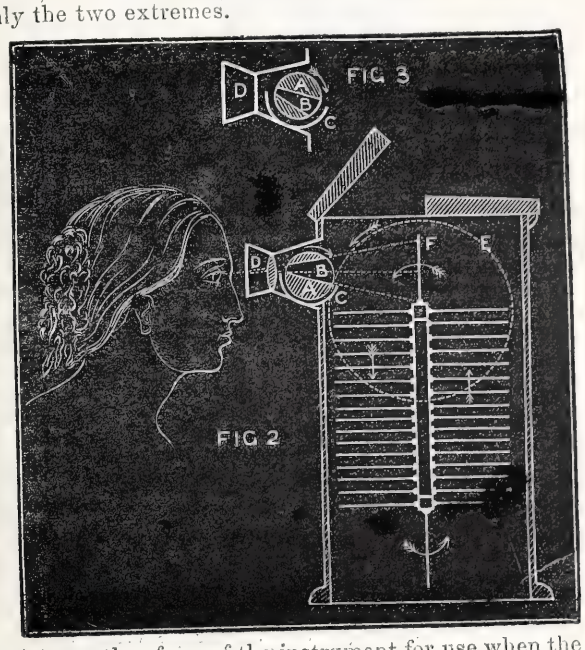
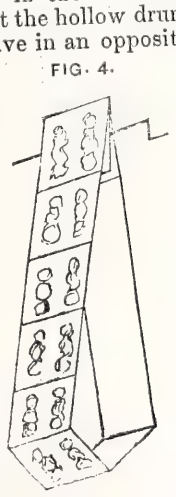


Fig. 2 is another form of the instrument for use when the motion depicted requires a larger number of stereographs, showing a more graduated series of the phases of motion. In this the pictures are arranged on an endless band, and are brought successively into view at F by rotating the square axis at the top in the direction indicated by the arrows. By the same movement the hollow drum A (seen more clearly in *fig.* 3) is caused to revolve in an opposite direction, bringing the aperture B into position contemporaneously with each picture in succession, the projecting screen C cutting off the view before the pictures have moved far enough to cause indistinctness of outline.

Fig. 4 shows another arrangement of the pictures that may be substituted in the preceding instrument for that depicted in the cut.

FIG. 4.



The preliminary experiments which led to this form of instrument were conducted by Mr. George Burnham and myself, and the patent is held conjointly between us. Nothing has been done as yet to present it to the public in a form which would make it saleable, though it is to be hoped that it will be brought into use, as it will call for a new style of portraiture, and will give professional photographers some more work to do.

ON DRY DEVELOPMENT OF DRY PLATES.

By John Glover.

Since the publication of Mr. Anthony's process for increasing the sensibility of dry plates, by subjecting them to the fumes of ammonia, I have been engaged in making a few experiments, with a view to test the value of what appeared from its description to be so promising.

I prepared four plates exactly alike, coating the collodion film with a solution containing twenty grains of tannin and fifteen grains of honey to the ounce of water, which is the proportion I find to give the best results. I gave two exposures for each subject, in proportion as one to four, the longest being, as near as I could judge, sufficient for ordinary treatment, which proved to be the case on development, although the light was excessively dull and the subject a gloomy one.

I then proceeded to fumigate the plates which had received the shorter exposure in the following manner:—An ordinary plate-box, capable of containing a dozen glasses, was placed upon its side, so that the plate could be placed in the uppermost groove, with its film downwards. Into a dish nearly the size of the box was poured strong ammonia, with four times its volume of water, in sufficient quantity to cover the bottom one-eighth of an inch, and placed in the box underneath the plate. The whole was then closed up for the space of three minutes. On taking out to examine I was most agreeably surprised to find a fully-developed image, displaying all the details, down to the very shadows, as distinct as the negative which had had the full exposure; but of course lacking the necessary intensity, which, in amount, I could only compare to the appearance of a glass positive when viewed by transmitted light. The plate was again subjected to the action of the gas, but with no marked increase of vigour.

I proceeded next to develop in my usual way, by soaking about two minutes in water, then covering with a solution of pyrogallic acid, without either acid or silver. Under this action I could not discover much addition to the intensity. On adding the silver with an additional quantity of citric acid, my hopes were doomed to disappointment, as a cloudy deposit commenced, which completely veiled every trace of an image, with the exception of the highest lights.

The appearance could not be compared to genuine fogging—which is invariably caused by *metallic* reduction—the deposit being wavy and irregular, and of a brownish tinge by reflected light, having the unmistakable appearance of *oxide* of silver. This proved to be the fact. The film had retained a portion of the ammoniacal gas which had not been dissipated by a surface washing; hence the decomposition so familiar to chemists and most photographers, the ammonia uniting with the nitric acid of the silver setting the oxide free.

This induced me, on my second trial, to treat the fumed plate, firstly with an acid, so as to convert the tenaciously-adherent ammonia into a neutral salt previous to the addition of the silver.

On removing the second plate from the box the image was equally visible. After soaking in water the usual time I covered it with a solution of pyrogallic acid with a good dose of acetic acid. I was equally surprised to find, instead of any progress in the development being made, that the image gradually began to fade, and, if the action had been continued, would, to all appearance, have disappeared altogether.

I arrested this in time by the addition of a few drops of acid silver solution: the balance was restored and the image began to increase in vigour, until an intense negative was obtained.

The result, to say the least of it, was encouraging, although not so clean and free from defects as the plate exposed and developed by the usual method.

I was puzzled for some time to account for the phenomenon of the fading of the image under the influence of so powerful a reducing agent as pyrogallic acid, and I came to the conclusion that the deposit obtained by the action of ammonia differs from that which usually appears by the agency of those substances which we have hitherto employed as developers—in that the former is oxide of silver, as proved by its solubility in acetic acid, while the latter is indisputably metallic.

There exists, no doubt, a fraction of free nitrate of silver in every dry collodion film, the last traces of which are not removed by either washing or long soaking in water. This being equally diffused throughout the whole sensitive film, we should suppose, in the ordinary course of things, that, if capable of being converted into oxide at all by the agency of ammonia, the whole would be decomposed. Such, however, as proved by my experiments, is not the case; and henceforth ammonia, instead of being discarded from our photographic laboratories as a dangerous re-agent, may, when once we have curbed its too restive properties, be classed as a *dry* developer for dry plates.

To make it dryer still, and in a convenient form for travelling, I propose to employ two separate jars—one containing *muriate of ammonia* (the sal-ammoniac of commerce), and the other *quicklime*. It will be necessary to make the latter air-tight. Both to be reduced to as fine a state of division as possible, and mixed in about equal proportions as required. A few drops of water sprinkled over the mass ensures the evolution of the ammoniacal gas, in which form I have no doubt it will be more energetic in its action than when in solution as the liquor ammoniæ. Other advantages would ensue—the evolution of heat, and most probably the exposure of dry plates reduced to a minimum.

I attribute the difference of my results, in comparison with those arrived at by M. Borda, to his having, as I suppose, employed *tannin* only as a coating. I would venture to suggest that the action of the honey is to retain sufficient water in the film to set

up a decomposition of the nitrate of silver, which would not be so energetic in the case of high-dried *tannin* used alone.

I throw out these suggestions, trusting that the matter will be taken up by other experimenters who have more time and greater facilities than the writer in the carrying of them out, there being still a wide field for research, as we have undoubtedly much to discover in relation to the nature of the photographic image.

[The experiments above detailed are very interesting; but we are not surprised at the results, because, honey being a reducing agent, acts energetically upon nitrate of silver in the absence of free acid, hence the appearance of an image after the ammoniæ had acted upon the impressed plate. As, however, all the free nitrate of silver would have been reduced on the first application of ammonia, it is clear that no further application of it or of pyrogallic acid could intensify the image, there being no nitrate of silver left wherewith to perform the operation.

We have received two illustrative specimens from the author of the preceding paper; but they are far more favourable ones than his own modest claims would lead one to suppose. He describes them as follows:—

"No. 1.—*Lydiate Abbey.* Developed by ammonia, and the one referred to in the paper. A dull day; and the subject—especially the foliage—badly lighted.

"No. 2.—The *Custom House, Liverpool.* A much brighter light. Taken with a *slow* single lens. Exposure, one minute; which is what I should have given with wet collodion."—Ed.]

International Exhibition.

THE PHOTOGRAPHIC APPARATUS AND APPLIANCES.

By Samuel Highley, F.G.S., F.C.S., &c.

The antipodes of "*decensus averni facilis est*" must certainly have been in the minds of the Royal Commissioners when they consigned photographers to the cockloft of the central tower, above the picture galleries, and its treadmill of seventy odd steps. As far as the generality of visitors are concerned, the English section of Class XIV. might as well have been arranged with Allsopp's ale casks in the cellars of the building; for it is about equally well known that a cellar devoted to beer and a garret devoted to photography exists in some (but undiscoverable) part of the Exhibition. Both the English Photographers and the Educationalists who jointly occupy this "sky parlour" have just cause for complaint at being thus shelved high, if not dry, while their foreign competitors have been assigned prominent and accessible positions on the floor or galleries of the building. Nor has the dissatisfaction of the photographic apparatus-makers been alleviated by the *à priori* decision of the Jury of Class XIV.—that medals should *not* be awarded to photographic apparatus*—especially when it has been found that in other classes medals have been given to such things as bear's grease and *bon-bons*. We believe that it is the only branch of trade that has been excluded from the chance of obtaining the honour of a medal and the recognition that ingenuity deserves. In fact, we regard this decision as a breach of faith with the exhibitors in this department; for if they had been informed, prior to the opening, that their goods *could not* under any circumstances obtain a medal, we know that many would have saved themselves much expense by sending in smaller contributions, or by withdrawing altogether from a department that in every way placed them on such an unfavourable footing. If the Jurors thought that the apparatus ought to have been arranged with the philosophical instruments in Class XIII. (an opinion in which most persons will agree), yet they were not justified in their decision, as the exhibitors themselves had no choice in the matter, but were obliged to claim space according to the dictates and illogical classification of the Royal Commissioners; but we suspect that the apparatus-makers have been made the scapegoat of the vexed question between photographers and the Royal Commissioners as to the claims of photography to a place among the Fine Arts, and while the Commissioners have ignored the *artistic* element, the photographic Jurors have, as a counterblast, ignored the *mechanical* element that had been foisted upon them *nolens, volens*. An exception has, however, been made in this objectionable decree in favour of the celebrated lens-makers, Dallmeyer, Ross, and Voigtlander; and, though objecting to the want of some fixed principle on the part of the Jurors as to whether apparatus should or should not receive their recognition, few of the apparatus-makers will, we think, cavil that such houses should be awarded a medal, for it is owing to their labours, conjointly with the discovery of Archer, that photography has within the last few years become a rage and opened up a new branch of trade.

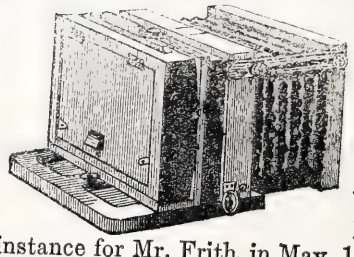
It is to those houses who devote themselves specially to the optical branch of the apparatus employed in photography that we shall first give attention.

Mr. Dallmeyer exhibits single combination view lenses, of large aperture, for instantaneous stereoscopic pictures, of four and a-half and six inches focus, and his well-known double combination stereoscopic lenses, triplets, landscape, quick-acting *carte-de-visite* and portrait lenses, for small or large pictures, together with a new form of lens for the purposes of enlargement, of which photographers will have a description during the forthcoming session of the London Photographic Society. The qualifications of these lenses are each illustrated by photographs taken by some of our leading artists, which is a rule that ought to be followed by all opticians, for it settles all disputes as to what a lens will or will not do *in practice*, or ought or ought not to do *in theory*. In connexion with these is an excellent display of cameras for taking stereographs, with several ingeniously-contrived forms of shutter for instantaneous exposures for landscapes, *cartes de visite*, and portraits—all of which, however, have been previously described in Vols. VII., VIII., and IX. of this Journal; in fact, after a careful examination of the entire collection of photographic apparatus in the Exhibition, we are surprised at the small amount of novelty discoverable therein, for it is quite the exception to find things that have not already been described in these pages.

Mr. Ross exhibits, both in this department and in Class XIII., his lenses for stereoscopic and landscape views and portraits: he also exhibits a new set of quick-acting *carte-de-visite* lenses, which yield pictures of great beauty, with good marginal definition. He also exhibits a new form of camera, which is very convenient for the method adopted by Wilson of using the same instrument for stereoscopic and landscape views of 7¼ by 4½ inches; but he has still further added to its utility, whilst but slightly increasing its bulk, by making it suitable for *carte-de-visite* portraits, or album views taken in a horizontal direction by the *carte-de-visite* lenses.

The plates used for a single or a pair of lenses are 8 by 4½ inches in size. This camera has a range of focus of from 3½ to 11 inches by means of a bellows body in the front and a sliding solid body in the back part, worked by a rack and pinion movement, the details of which will be readily understood by aid of the following diagram. This instrument may be had either with or without a swing back. Mr. Ross prefers for an instantaneous shutter the flap arrangement we described on a previous occasion, wherein the frame is arranged so as to meet the flap in its descent, as shown in *fig.* 2, at 1, but made of a light material so as to avoid jarring the camera as much as possible. This arrangement, Mr. Ross states, was made in the first instance for Mr. Frith, in May, 1856.

FIG. 1.

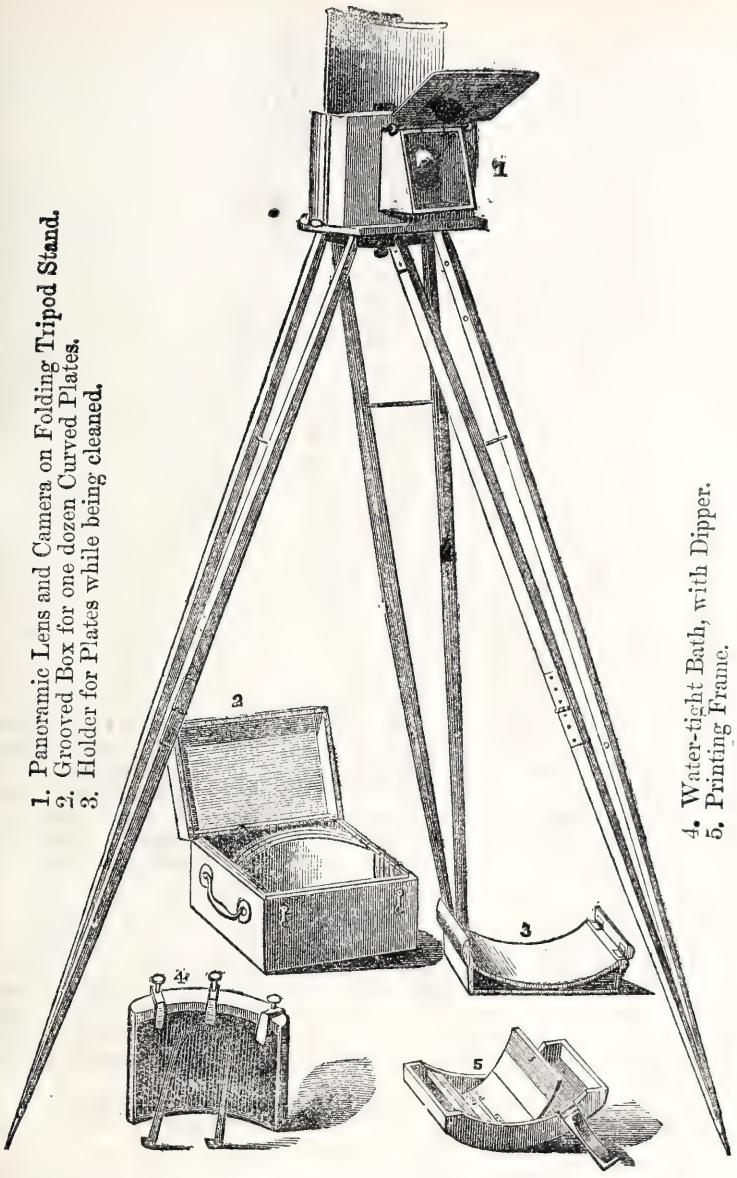


When the four lenses of an ordinary *carte-de-visite* camera have to be exposed simultaneously a very convenient rod-and-crank arrangement is employed, by which two flaps are raised and depressed simultaneously, and, while raised, act as shades to the lenses. By aid of a stop a long or short exposure can be given at will. In connexion with the landscape cameras we observed a very ingenious portable mount for the lens, which, by means of hinged supports for a flexible tube, shuts up flat, after the fashion of a Gibus hat. One of the great features of Mr. Ross's contributions is his perfected set of panoramic apparatus for Mr. Sutton's lens. As this instrument has been previously described in these pages, and its merits frequently discussed, we will only add a diagram of its present form. We may state, however, that a curved porcelain bath now replaces the gutta percha one formerly employed.

In reference to the *mechanical* arrangements lately described for securing panoramic pictures, Mr. Ross informs us that he made the first of the rotating cameras with a graduating semicircle for Mr. Salvin, in July, 1861. Mr. Ross has just completed the largest Sutton's panoramic lens he has yet made, which gives pictures nineteen by eight and a-half inches. The largest he has hitherto

* The thin edge of the wedge, however, having been inserted in the English section of Class XIV., by awarding medals to *photographs taken by* so-and-so's *apparatus and collodion*, was driven home in the French section, wherein we find that medals *were* awarded to apparatus, though neither in ingenuity or workmanship can a superiority be detected by *ordinary* observers.—S. H.

FIG. 2.



1. Panoramic Lens and Camera on Folding Tripod Stand.
2. Grooved Box for one dozen Curved Plates.
3. Holder for Plates while being cleaned.
4. Water-tight Bath, with Dipper.
5. Printing Frame.

made yielded pictures sixteeen by seven inches. There is no question but that this instrument, when placed in intelligent hands capable of appreciating the class of views for which it is applicable, is capable of yielding pictures of great beauty, and its advantages over the ordinary forms of lenses for delineating such subjects as those to which we refer will be readily appreciated by comparing the annexed counterparts of photographs (*figs.* 3 and 4),

FIG. 3.



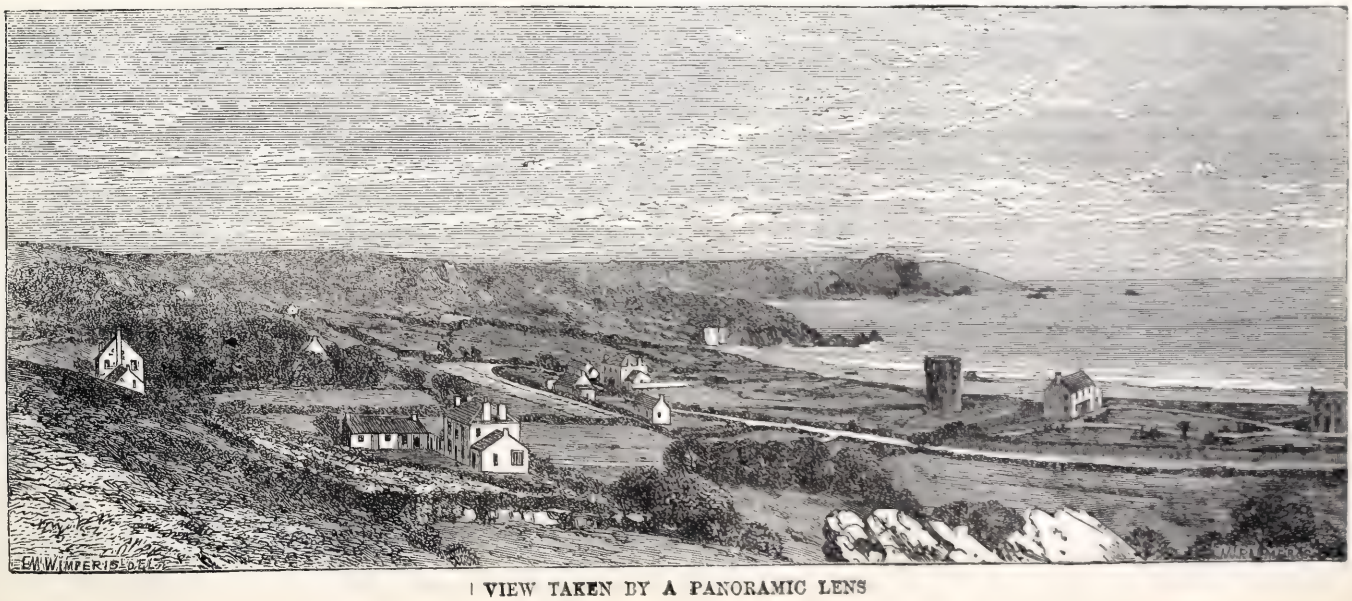
VIEW TAKEN BY A LANDSCAPE LENS.

the one by a landscape lens and the other by a panoramic lens, both of five inches focus, taken from the same point of view. We may well say, with *Hamlet*, "Look on this picture—and on this." In the case in Class XIII. several photographs will be found illustrating the capabilities of Mr. Ross's lenses.

The only other sets of lenses that have photographs appended to illustrate their qualities are those of Voigtländer, in the Austrian Court, who exhibits a fine collection, the value of which may be estimated by the beauty of the portraits by Lewis Angerer, most of which are of large size; and of those of Emil Basch, in the Prussian Court, illustrated by some fine photographs taken by Albert. In the Foreign Department the following makers contribute samples of their lenses, but afford no means of their value being judged of, viz.:—Dertzel, of Austria; Kreuss, and Manecke, of the Zollverein; Hermagis, Darlot (successor of Jamin), Bertand, Derogy, Millet, and Quinet, of Paris. We may also class among those who exhibit lenses without accompanying photographs to illustrate their qualifications, those of Shepherd, in the English Department, whose business, however, we understand, has been transferred to Messrs. Squire and Co. since the opening of the Exhibition.

(To be continued.)

FIG. 4.



VIEW TAKEN BY A PANORAMIC LENS

CABINET PICTURES.

Miscellaneous Subjects, Photographed by Wm. Hanson, *Leeds.*

About twelve months ago we had the pleasure of criticising some stereographic photographs by Mr. Hanson, amongst which were some that were entitled to a place in the first rank for artistic excellence. We have recently received from the same gentleman (taken, as we are informed, with an aplanatic lens), some specimens of a larger size (about eleven inches by nine), which testify to his skill in manipulating something more exacting than stereoscopic plates, and which will assuredly add to his reputation.

The North Aisle of Whitby Abbey is a study of antiquarian rather than of pictorial interest, yet not deficient in the latter element so far as treatment is concerned. The photography is excellent—the definition perfect, even in the deepest shadows—and the gradation of tone all that can be desired;—the single fault, if it be one, consisting in perhaps rather too great softness for this class of subject, producing a slight deficiency of brilliancy.

It is a singular circumstance, though easily accounted for, that we generally find photographers, who have created a name for their skill in producing large pictures, when they subsequently turn their attention to stereography apt to produce "hard" pictures of the smaller class until they have worked at them for some time; but here we have an instance of the converse of this—one who has already excelled in stereography producing larger works with a somewhat exaggerated degree of softness. Undoubtedly this is the safer error of the two, and can be very easily remedied on future occasions.

A Quiet Home—a cottage on the banks of a little stream, the bed of which is now almost dry, with the exception of a portion of its centre, and snugly surrounded by numerous trees and shrubs. Across the stream, stretching from bank to bank, is a wooden footbridge, on which a little urchin is standing, evidently busy doing the "looking on" part, in which the juvenile population in any district are generally so diligent. This is a very pleasing and well-executed subject, but could be materially improved by vignetting, or even by cutting it, before mounting, to an elliptical form; because, as it is at present presented to our inspection—that is to say, cut to a rectangular form—the horizontal line of the footbridge and the perpendicular ones of the supports, to say nothing of the stems of the trees, repeat the outlines of rectangle too directly to form a harmonious combination, it being a trifle too formal and angular.

A Bit from a Yorkshire Glen is a very pleasing study. Rough angular rocks, piled in confused masses and laved by some tranquil water, are clothed with masses of elder bushes, and backed by a plantation of stately fir trees. Although in deep shadow there is plenty of detail; but the photographic equivalent of green foliage is certainly not sufficiently light in tone to convey an adequate idea of the spot. This is, however, not a fault of the manipulator, but a weakness in our chemical knowledge that we hope will one day be overcome. The sky is suggestively shaded so as to give a good idea of clouds.

Repose—On the Strid, near Bolton—is a very appropriately-named and very charming picture, abounding in artistic beauties—nicely-balanced undulating lines, tending towards a natural pictorial focus, where the tranquil stream loses itself in the distance, owing to a slight change of direction—exquisite definition of detail, combined with the most perfect harmony and subordination of parts, yet not wanting in breadth—and complete in unity of design. We have no objection to take to the exquisite softness here: it is precisely the kind of treatment that suits the subject best. The foliage is truly magnificent, every leaf almost defined, yet there is a perfect absence of spottiness of effect. The river is smooth almost as a mirror; but it is neither an opaque patch of white nor a pool of ink, but beautifully clear and transparent water, and evidently in motion, though gliding gently in complete harmony with the spirit of the scene. There is a light about the horizon gradually toned down possibly to a shade deeper than is absolutely needful; but even to make such a suggestion savours somewhat of hypercriticism, for in truth we have rarely seen a finer production in landscape photography than the picture now before us.

WHERE TO GO WITH THE CAMERA.

By Our Own Pioneer.

EXETER—THE TAW AND TORRIDGE.*

About four miles from Crediton, a short distance from the station, is Copplestone-cross, an old ecclesiastical lythoglyph or monument some thirteen feet high, rudely ornamented with rough scrolls: this is a good subject for the stereoscope. From the station trains pass on to Eggesford, the next place most worthy of note, when Eggesford House, the seat of the Earl of Portsmouth, the woodman's lodge, on the outskirts of the park, the old church, and ruined remains of a former mansion, with the fine specimens of beech and oak stretching away to the river's edge; the old rustic bridge at the end of the copse, with the furze-crowned heights of the opposite woods, will give a rich series of exquisite pictures, illustrative of some of the beauties of Taw Vale.

The line of the vale should now be abandoned, and a road to the right, near the station, followed up hill to Chawleigh. Here a good subject will be found in the church, and in the interior also, with its richly carved screen. Between this and Chulmleigh, some two or three miles, is a deep ravine, crossed at two or three places by road and foot bridges, embracing all the requisite points for effective pictures:—one in particular, to the left of the town, with its bold and massive wooden frame-work patched up here and there with picturesque roughness—the broad steps and rude hand-rail, leading to the gravelly bank—the old ivy-hung barton skirting the lane, with the Elizabethan mansion of "Leigh" cresting the distance.

Chulmleigh itself, with the exception of the church, is not worth a visit. About two miles below is the high road leading on to Barnstaple. Passing the Portsmouth Arms and Umberleigh Barton to Umberleigh bridge, this distance—some twelve or thirteen miles—is through the most richly-wooded part of the Vale, and it will be found better to follow its direct line than to turn off for any villages right or left, as the old foot bridges and wild hazel gaps—the valley mill under Chittlehamholt—the old cottage near the toll bar, with the winding craig path to Bickington—the oblique railway bridge that crosses the Taw at Umberleigh—some cottages, with lofty overhanging trees, bank and brake reflected in the river—are all subjects distinguished for harmony and natural beauty, totally divested of any made-up stiffness, and strikingly illustrative of some of the best effects that distinguished the works of Lee and Creswick. There will be found in this route ample material, without deviating right or left, till such time as the broad stone bridge is reached that spans the Taw, the views from which, either looking to, or from, Barnstaple, are of that long line-like hazy character so often met with in the flat part of Somerset.

In lieu of crossing the bridge, take the road to the left to Tawstock, when the first available subject will be an old lime-kiln and barge house, overhung with some fine old trees, the bridge and turn in the Tawton road coming in on the left. Leaving this and following the bank of the river through the vale towards Barnstaple, you turn into the fine park of Tawstock Court, the seat of Sir Bouchier Wrey, Bart. Among the trees, the oaks in particular will claim attention. Of the mansion, the only good remnant is the old gateway. The church is well situated for photographing, and in the interior will be found some fine monuments. A short distance from the church there is an opening, framed in on the right by a noble group of stately trees, the park palings and keeper's cottage being in the foreground; and slightly to the left, the river, in the middle distance, with the old farm building at Tawton (once the palace of the Bishops of Exeter), with the church, rectory, and rising ground filling up the back.

Further on, by the river bank, is a projecting mass of rock, quite a Salvator Rosa bit, thickly clothed with furze and bramble, the base bound and girded by some huge limbs of overhanging trees, forming an admirable foreground. Some exquisite distances can be got from this, either looking over Newport, and including the full length of the railway bridge, or more to the left over the station. Following the bank of the river, and nearing Barnstaple, much of interest will be seen and met with,—the church, by the infirmary, at Newport, the bridge and town from the river bank, or on the opposite side. Barnstaple is now close at hand, with plenty of inns and lodgings. It can boast of being well known in and out of Parliament. Photography is well represented there—one family in the High-street displaying more than usual proficiency in the arts, mechanical and pictorial, while the brush and pencil are used with effect and taste by various amateurs and professionals. Barnstaple most worthily distinguished itself in the fine-art departments of the Bath and West of England Exhibition some few years back, and no doubt will maintain a high place when the association appears in sixty-three at Exeter. It will take a day or so here to hunt up and visit even a few of the admirable subjects in the neighbourhood. Among them may be noticed one from Pottington Point. This place will be found by going along the Braunton-road, past the Rolle Quay, and then turning down to the river, when a fine view may be got of the bridge, town, quay, railway station, shipping, &c., &c. On the opposite bank, under Anchor Wood, some good effects may also be secured, bringing in the objects of note in and about Pilton. Braunton is worth a visit for the church alone, while on the line, and but slightly out of the road, will be found much of interest in the churches of Ashford and Heanton Punchardon: as these places are near the estuary of the Taw and Torridge the light-houses and parts of Appledore and Northam can be brought in as distances. Many other places could be enumerated close at hand, but the above are deemed sufficient for those who are limited to time, while others who have much of the same at their disposal can seek and select a further series in accordance with their own tastes and fancies, not forgetting to go over Braunton Barrows, and take a look at Croyde Bay and Baggy Point, then turn to the Torridge, the long bridge at Bideford, and high ground about Annery, giving a slight hazy distant line tint; the Look-out Tower at Northam, and broken ridges of sloping banks at Appledore and

* Continued from page 333.

Boat Hyde, on the right; the lodge at Tapley, with the line of rail to East-the-Water on the left, Instow coming in as a marked and prominent point; while the long, flat foreground of sand, with sloops and brigs afloat or high and dry, will give several first-rate long-shore pictures.

Returning to Barnstaple, Bideford can be reached by road or rail. If by road, go round by the mansion at Fremington, down to the river's edge, on the hard, close by the lime-kilns, where two or three good views may be obtained; then to Bideford, the town by the ford, with its long bridge of nearly 700 feet, built on 24 arches, about the commencement of the 14th century, at the cost of one of the Grenville family, and, as in many other cases (Gorway's chapel, for instance, at Tiverton), old historians have mixed up the circumstances with a dream, which legend can be found in any of the local histories by such as are curious in these matters. However, the Grenville fancy of a past age has left a most desirable fact for the artist and photographer of the present, as the said bridge forms a most telling point, either at high or low water. The town has a speculative builder, who has risen to a foremost position by industry and perseverance. He has erected several houses in commanding situations, some of them of that picturesque character as to assist the views, not mar them. The town and art ought to be much obliged to him. There will be found a choice of accommodation, either at the public inns or private houses. Bideford is well seen from East-the-Water, or from Chudleigh Fort, a small battlemented structure, erected at the time of the rebellion. As the buildings rise considerably upwards from the quay (a broad walk of some 11 or 12 hundred feet), it has, in conjunction with the bridge and surrounding country, an imposing appearance. Crossing the quay, and following the river bank towards Northam, a shipbuilding yard is reached. Here will often be found ships of large size, either building or undergoing repair, making excellent subjects for the stereoscope. At the end of the dock an old hull is sometimes lying in all the picturesque loneliness of the want of shrouds and spars, all ready for a break-up. This, with the shore of the river under the lodge, near Instow and the quay, is an excellent marine view. If the tide is low, much may be got from about this situation, either towards the Look-out at Northam or the bridge.

Following the shore to Appledore, innumerable river subjects, peculiar to this place alone, and not to be met with in any other part of England, as very many of them can be made principal or foreground objects, or by varying the situations, rendering them of equal interest, either in the middle or extreme distances. They bear a singular resemblance in many instances to some of the water-colour sketches of George Balmer, who painted the once popular series of pictures known as the *Ports and Harbours of England*.

Northam and the church must not escape notice. It has been restored within the last few years, and is well placed for a subject. The Pebble-bridge is the great natural wonder of the district, a remarkable heap of large and small stones, extending a couple of miles in a straight line, and forming a barrier between the sea and plain, called the Barrows. It is some sixty feet wide, and from twenty to thirty feet high—the stones varying in size from seven or eight inches in diameter to three feet. The shore scenes here are extensive ones, with Lundy in the distance. The other, the estuary of the two rivers, with the shores of the Taw up to Fremington Pill, the sloping sandhills and distant cliffs of the Braunton side, the light-houses and village, relieve the abrupt wildness of this romantic coast.

A return to Bideford may be made by the Northam road, or passing along the shore, under Appledore, an ascent can be made to the Look-out Tower. From it are fine and extensive views across the Channel to the Coast of Wales. The Church of St. Mary, at Bideford, dating from the fourteenth century—and where the author of "Meditations among the Tombs" was once the curate—is in the course of rebuilding. It contains an interesting monument of some of the Grenville family and a curious font. It is satisfactory to know that the reconstruction is entrusted to the hands of those who have repeatedly given proof of their fitness to successfully carry out the undertaking.

From Bideford to Torrington, by the old road, is pointed out as offering some first-rate subjects, and seldom traversed. The general route is by the bank of the river along the new road,—the views from which are equal to anything to be found, the renowned long bridge invariably telling with striking and peculiar effect. One of the most interesting old manor-houses in existence is at Weir Giffard, the property of Earl Fortescue, with the old Gothic gate-house overhung with ivy, the tower of the church rising above a fine screen of trees. It makes from the parterre in front, or from the marsh below the house, an excellent and interesting view. Permission should be obtained to inspect the hall, which contains a carved ceiling equal to anything of the kind in England, and not surpassed by that in the Chapel of Henry VII., at Westminster. The church, from the east; the interior of the same, with the altar, tombs, and figures; the Weir, with the lime-kilns and overhanging woods at Annery, are all good subjects. Nearer Torrington, and well seen from the meadow below Beam, is the aqueduct of the canal, cut at the cost of the late Lord Rolle, in 1824, with the understanding that the inhabitants were to give up bull-baiting. The barges are lifted into the canal from the river Torridge, by an incline at Weir Giffard.

Beam, and the view at Staple Vale, will bring the tourist into Torrington, a place of some repute, famous for making gloves. The site of the old castle, used as a bowling-green, commands a varied and extensive prospect. The church has been lately restored. It makes the best picture from the landing-window, over the hall of the vicarage. At Frithelstock, some two miles to the west, are the remains of the old Priory, founded in the reign of Henry III. Much that obstructed the view has lately been removed, and the fine ivy-mantled remains are seen to much advantage. It can be included with the church, which stands close by, either from the east or west. From Torrington visits can be made to the park at Stevenstone—a seat of the Hon. Mark Rolle—or to the far-famed Hartland or Clovelly, the most romantic nook of wood, rock, and water in the kingdom; or a return to Exeter by Dolton, Iddesleigh, Winkleigh, and the rail from Eggsford. The richly-tinted glades and slopy hollows of this delightful portion of the coast,—the shady dells and lanes,—with the gushing streams that bound from old mill wheels to the gulleys and rocky shores below,—with all those varied objects so highly prized by the admirers of the beautiful in nature,—are now in their most perfect aspects and attractive moods, ready to acknowledge the power of art, and yield to the subtle magic of the camera.

ON THE CONVERGENCY OF THE OPTIC AXES IN BINOCULAR VISION.*

By Professor Charles F. Himes, of Troy University.

In his monograph on the stereoscope, Sir David Brewster, while treating of the union of binocular pictures by the unaided eyes, when placed as they usually are—the right-eye picture on the right side and the left-eye picture on the left side—states:—"The distance in this case must be greatly less than the distance of the eyes, in order that the optic axes, in passing through similar points of the two plane pictures, may meet at a moderate distance beyond them." [p. 83.] "We cannot thus unite figures the distance of whose centre is equal or exceeds two and a-half inches." [p. 97]. "It is impossible to obtain, by the ocular stereoscope, pictures in relief from the beautiful binocular slides which are made in every part of the world for the lenticular stereoscope." [p. 123]. Prof. Wm. B. Rogers, in his able and exhaustive papers *On Binocular Vision*,† substantially endorses these statements, while disproving Sir David's theory of binocular vision founded on the successive convergency of the optic axes to the different points of an object. This assumption of a positive point of convergence of the axes, either before or behind the slide, in every case of the union of supplementary pictures, is counter to my own experience, and observations in cases of others. The limit of separation of similar points, and consequently of the size of the pictures from right to left, depends upon the constitution of the eye, which prescribes a limit to the movement of the axes, or, in other words, to the number of degrees through which the eye can be rolled. It is plain, however, that within these natural limits unvarying habit has established others, within which the movement is easy, and in most cases involuntary, beyond which requiring effort and even painful. There does not, however, appear to be an instinctive tendency to converge the optic axis in looking at objects. Many persons must have noticed that new-born infants appear cross-eyed; but that there is not a decided in-squint or out-squint, but a peculiar working of the eyes—an apparent want of concert in their movements—which appearance vanishes after a short time, to the great delight of all interested. From this early period there is an unvarying practice of convergency of the optic axes, and the limits within which it is done are practically parallelism on the one hand, and the angle formed by the axes when we look at objects placed at the distance of distinct vision on the other hand. It might be presumed that within these limits there would be others, peculiar to the occupation of the individual; but the habit within the above range is so thoroughly formed early in life, and the power so frequently exercised at all periods, that probably no decided effect would be noticed.

The opinion expressed in the remarks quoted must be founded either upon the hypothesis that it is impossible to render the optic axes parallel or divergent, or that when the axes are in either of these positions, and the supplementary pictures are presented, so that the axes pass through similar points, no union, attended with the usual effect, can take place. The first supposition only proposes a difficulty similar in kind to that of closing one eye whilst the other remains open—an operation contrary to our uniform habit of working the eyes in concert. The second supposition is met by facts to the contrary. Pictures more than three inches apart can be united, and the difficulty in so doing does not lie entirely in the unusual position of the axes. Every one, who has made the trial of uniting pictures by converging the axes to a nearer or more remote point, will recollect the unusual exercise of the visual organs it required; and in either of those cases there is plainly nothing unusual in the position of the axes, the difficulty being, as Professor Rogers has shown, in the necessity of violating the habit of converging the axes and accommodating the eyes to the same point. Sir David notices that it is easier to get stereoscopic effect by transposing the pictures and uniting them by converging to a near point; and the only explanatory statements made by him leave us to infer that he considered the difficulty to be in the convergency. "This tendency," he remarks in one place, "to a distant convergency is so rare that I have met with it only in one person;" and, as the ordinary binocular slides could not be used on account of their size by the method of distant convergency, there was no advantage gained by its use over the other ocular method. The difference between the two arises, no doubt,

* *American Journal of Photography.*

† *American Journal of Science*, Vols. XX. and XXI., new series.

from the fact that the points of accommodation and convergence more nearly agree in one case than in the other; for, when the similar points are nearly the distance between the eyes apart, the axes will be nearly parallel in passing through them to a more distant point; but when the pictures are transposed, the point of convergence will be between them and the eyes: the accommodation of the eyes will be about the same in both cases. When the pictures are separated by a distance equal to, or greater than, that between the eyes, it will require effort, as in the preceding cases, to prevent the axes from converging, and for similar reasons. Those who have overcome this difficulty by continued exertion, will perhaps remember that even after they had succeeded in producing three pictures—or rather in reducing the four—by causing the two interior ones to coalese, there was an indistinctness—a hazy, atmospheric appearance—although the relief was evident: that sometimes there was an instantaneous clearing up, and at other times this took place gradually, just as the habit was overcome suddenly or gradually, and the eyes were permitted to accommodate themselves to the pictures, whilst the axes remained in the same position. If, for the photographic pictures of the previous experiments, you substitute two circles of about half-an-inch in diameter, they will be more readily caused to overlap by converging the axes either to a nearer or more distant point, probably because there is so little about them to invite that involuntary scrutiny by the eyes which causes the axes to converge to the point observed. In uniting pictures by convergence to a point beyond them, it is of assistance frequently to look at a distant object, and introduce gradually the slide before the eyes; but when the distance between the points to be united equals or exceeds that between the eyes, we cannot be assisted in that way. In some such cases, when persons have succeeded in obtaining the relief, it has been by staring at the pictures, as if gazing into vacancy, as is done sometimes in resting mind and body, or when the mind is abstracted in thought and persons and things are stared at, but not noticed, the visual organs being inactive, whence it also seems that the normal state of the axes is that of parallelism. In this case, as in the preceding, the complete effect generally follows a hazy appearance.

Having obtained the control over the eyes necessary in the previous experiments, it will be easy to acquire the power of uniting pictures farther apart, or of rendering the axes divergent, or rather convergent, to a negative point. The best method is to take an ordinary stereograph, and cut apart the right and left pictures, put them in their proper position, and unite and separate them by a gradual motion; the axes will remain fixed upon the similar points, and follow them, although you will be unconscious of any change, and the point of accommodation of the eyes will remain the same. If difficulty is experienced in uniting them in their proper position, they may be allowed to overlap a little at first. When a separation of three inches is passed in the above experiment a change will be felt, and probably during the first trial all will become confused at three and a-half inches; but up to that point the stereoscopic effect will be complete. By practice I have acquired the power of uniting the ordinary binocular slides as readily without as with an instrument, and, by the method just given, have experimented on the limit of separation of the pictures for my eyes, and afterward by means of larger photographic pictures produced for the purpose. I found at first that it required effort to overcome three inches; but by prolonged practice, at different times, I increased the distance to four inches. Exercise of this kind is, however, uselessly severe. Further experiments in that direction were therefore abandoned, and the limit now appears to be three and a-half inches. After an hour's exertion as above great difficulty was experienced in reading: it required conscious effort to prevent the letters from becoming double. The habit of converging the optic axes to the point of accommodation had been so broken that it became necessary to retain them in position by a decided effort. In reading old books, the old-fashioned s'es were peculiarly annoying, as they invariably doubled; and when anything unusual or difficult was met with—as, for example, the rendering of a word in translating—the eyes immediately attempted to assist in overcoming it by turning the axes in all directions, causing the letters and words to march and countermarch from right and left. No such effect results from a moderate amount of exercise in using the ordinary stereographs. The weariness of the eyes in all the preceding cases is not wholly due to the unusual character of the muscular exertion, but in part to the fact that the eyes notice many details when the supplementary pictures are combined that otherwise would have been neglected, perhaps even in looking at the scene itself. To take an extreme case: a line may appear to be a blemish in a single picture—it *may appear to have* no perspective position. By binocular examination of the slide it turns out perhaps to be a twig, which extends far into the foreground, all other parts of the tree having been cut out; there are dots which turn out to be leaves, and so forth. The eyes instinctively, as it were, run over and study these—exceedingly more multitudinous and minute than pre-Raphaelite—details of the photographic representations: they work rapidly and severely, and soon become fatigued.

Since convergence of the optic axes to a positive point does not appear to be essential to the perception of relief by means of pictorial representations, is it not simply accessory to the perception of the relief of the objects themselves? Is not the effect in all cases due to the simultaneous presentation of two supplementary pictures to the retina, without regard to the angle formed by the optic axes? The successive convergency theory must at least be modified, so as to consider perception of distance dependent merely upon the movement of the optic axes, not necessarily from one positive point of convergence to another. Whether this movement is simply a criterion by means of which we unconsciously form an estimate of distance by long experience, or whether there is an absolute and necessary connexion between this motion and our ideas of distance, so that we *see* and do not *estimate*, distance is a matter of dispute; but there is something so plausible and analogical in Dr. Berkley's theory, which meets all cases of convergence, whether to a positive or negative point, that we insert the conclusion of his argument:—"It remains that we inquire what ideas or sensations there be that attend vision, unto which we may suppose the ideas of distance are connected, and by which they are introduced into the mind. And first, it is certain, by experience, that when we look at a near object with both eyes, according as it approaches or recedes from us, we alter the disposition of our eyes by lessening or widening the interval between the pupils. This disposition or turn of the eyes is attended with a sensation which seems to me to be that which in this case brings the idea of greater or lesser distance into the mind; not that there is any natural or necessary connexion between the sensation we perceive by the turn of the eyes and greater or lesser distance, but because the mind has, by constant experience, found the different sensations corresponding to the different dispositions of the eyes to be attended each by a different degree of distance in the object."*

These views of Dr. Berkley's Sir David Brewster, however, considers totally erroneous, and contends that our perception of distance is not the result of experience.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The first meeting of this Association for the Session 1862-3 was held at Myddleton Hall, Islington, on Wednesday evening, the 17th ult.,—George Shadbolt, Esq., Vice-President, in the chair.

Messrs. James Cooper and Henry Greenwood were ballotted for, and duly elected members of the Association.

Mr. Simpson handed to the Chairman, for examination by the meeting, some very charming panoramic photographs, by Mr. Wilson, of Aberdeen, which were much admired.

The Secretary, Mr. J. C. Barnett, then read a paper, by Dr. Maddox, *On the Delineation of Microscopic Objects by Photography.* [See page 362.]

During the reading of the paper an extensive collection of specimens was handed round, illustrating the high degree of excellence to which Dr. Maddox had attained in this interesting and valuable application of the photographic art. The delicacy of detail, and other characteristic features, were reproduced with especial success in the enlargements of the *Arachnoidiscus Ehrenbergii, Campilodiscus clypeus, Triceratium favus, Surirella bifrons,* and, also, in a species of small fly, the *Midge,* common on the pink and other plants. The accuracy with which the filmy, feathery character of the wings in this latter specimen was rendered was truly marvellous.

At the conclusion of the paper, the thanks of the meeting were accorded to Dr. Maddox, for his interesting communication. While inviting discussion on the subject matter,

The Chairman directed special attention to the photograph of the *Midge* noticed above, asserting that many of the enlargements submitted for inspection would even now, notwithstanding that they were printed on paper, bear a further enlargement of some twenty or thirty diameters. The quality of the specimens then before the meeting was, he thought, well calculated to remove the reproach which had long attached to photography, to the effect that although it rendered the generality of objects with great truthfulness, it was inadequate to the more delicate operations involved in the practice of photo-micrography.

Mr. Hislop desired to know what aperture Dr. Maddox used? The specimens exhibited were certainly the best he (Mr. Hislop) had ever seen.

The Chairman, in reply, observed that no particular aperture was mentioned by Dr. Maddox: he (the Chairman) was, however, of opinion that the Coddington lens employed would not admit of more than 30° of aperture. In reference to the question of detail, Dr. Maddox had found that it was possible, by judicious management, to make up in the time of exposure for what could not be seen by the eye in focussing when a small angle of aperture is employed. With the object of eliciting further discussion, the Chairman reminded the meeting that strangers as well as members of the Association were invited to join in the discussions, he, therefore, ventured to hope that Professor Emerson (with whose company they were honoured that evening) would favour the members with his views on the subject then before the Society.

Professor Emerson regretted that he had no extended experience to record on the matter, his experiments having been confined to the preparation of dry plates for Professor Rood, who, for micro-photographic purposes, found them as good as wet ones.

The Chairman observed that it had been frequently objected that the condensation of the sun's rays would greatly injure a good object-glass, and he thought the ingenious contrivance of Dr. Maddox, in making the

* *An Essay towards a New Theory of Vision* by George Berkley, M.A. Dublin: 1709.

rays cross just before entering the object-glass, was calculated to remove the objection, and was on that account worthy of commendation.

In the absence of further discussion on this paper, Professor Emerson directed attention to some stereographs received in exchange from various members of the Amateur Photographic Association of America. To assist in the examination of these, he had brought a simple and cheap form of stereoscope, having a very ingenious arrangement for altering the position of the lenses to suit the varying distances of the eyes apart. To each of the stereographs was attached a printed form of label stating the name of subject, the process by which it was taken, the kind of lens used, with its focal length, diameter of stop, time of exposure, and one or two further interesting particulars.

Professor Emerson, in reply to a question from Mr. Simpson referring to one of the stereographs, said that the preservative agent employed in the preparation of the plate was not albumen, but *solid milk*. Further, in reply to a question from the Chairman in reference to Harrison's lens, with which one of the stereographs was said to have been taken, he (Professor Emerson) explained that Mr. Harrison's lens was part of a sphere, and it was his opinion that two and a-half inches (the focus stated on the card) was the equivalent focus, and not the focus from the back lens.

In reply to a question from Mr. Simpson as to the value of the vapour of ammonia in the tannin process,

Professor Emerson gave it as his opinion that ammonia, applied in that way, would be found a good accelerator, although it must be admitted that there was a slight tendency to fog, which, however, might be overcome by adopting a suitable method of development.

The Chairman asked if there was any evidence of unequal action of the vapour, as sometimes occurred with the iodine and bromine employed in the Daguerreotype process?

Professor Emerson had not observed such an indication in the course of his experience. The method of application consisted in saturating a piece of cotton wool with liquid ammonia, and placing the whole in a deep dish over which the prepared plate might be suspended; in fact, as Mr. Simpson suggested, the best thing for the purpose would be a square glass dish such as was used for iodising the plate in the Daguerreotype process.

Mr. Hislop observed, in reference to the method of development by means of hot water, that he had exposed dry plates ten seconds, and by that method of development had obtained pictures as intense as though he had exposed four minutes. He would recommend the members to experiment in that direction, as he thought still greater perfection attainable. The only difficulty he had found was in keeping the plate coated all over, as they were so apt to get dry through subjection to so high a temperature as 200° Fah.; and there was, of course, a constant tendency to stains: care, however, and experience would soon obviate that defect.

Mr. Simpson exhibited some specimens of printing done on paper prepared with gums insoluble in water instead of albumen. The paper descriptive of the processes, together with the specimens, had only come into his (Mr. Simpson's) hands about a quarter of an hour before his starting for the meeting. He could not, therefore, give any detailed information on the subject. He could, however, state that the gum used in the specimens before the meeting was gum benzoin, and the chloride (one necessarily soluble in alcohol) was chloride of cadmium.

Mr. Hislop thought that the prints should be permanent.

Mr. Martin supported that opinion by a reference to the fact stated by Mr. Simpson, that the paper was prepared by *immersion*, so that it was coated on both sides with a substance impervious to moisture.

Mr. Simpson stated, as a further advantage of the paper, that it did not curl in drying; also that the benzoin and chloride of cadmium were dissolved in methylated spirit, and, when the paper was dry, sensitised by floating for five or ten minutes on the usual nitrate bath.

The thanks of the meeting were accorded to Mr. Simpson, Professor Emerson, and others who had taken part in the discussion. The meeting was then adjourned.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The next meeting of this Association will be held at the Rooms, 75, St. George's Place, on Thursday, the 2nd inst., when Mr. J. M. Crombie (of Auckland), will read a paper *On the History and Practice of Photography in New Zealand*. Other interesting matters will also be brought under the notice of the meeting.

Photography as a Transcriber of Art Productions.—In an article on the shortcomings of the Royal Academy, the *Athenæum* says:—"We say books, perhaps, too rashly; for, so far as the Academy is concerned, the students will have small opportunity of consulting them in the vainly-denominated 'Library,' that place of study being quite other than the gorgeous garden of art the young imagination conjures up. We believe it does not contain a single photograph. What a void this implies let those consider who know how infinite is the number of art productions that photography—and photography alone—has copied, and who are acquainted with the fact that two-fifths of art's triumphs have not been engraved at all, and one-half of the remainder are so badly done as to be utterly worthless to the student.

Notes of the Month.

As September meets its end, the usual photographic signs of sombre autumn thicken around us. The printer's frames are out later and in earlier; the portraitist sighs over the abbreviated days; the solar-camera operator finds a rapidly-increasing demand for his work at the very time when the misty atmosphere, with weakened light, render his hours of labour few and far between; and the landscapist sees the hours of his "hay-making" rapidly departing.

To the great mass of London photographers this much-talked-of season has proved very disappointing. Whether expectations were unduly great, or whether the counter attractions of the unusually numerous shows and sights of the great metropolis have proved too powerful rivals of the photographic studios, cannot well be determined; but the complaints are certainly numerous, and seem in most cases tolerably well founded.

Among the scientific subjects of the month that of dialysis, or "liquid diffusion," has been receiving attention, chiefly in consequence of a valuable paper contributed to the *Philosophical Magazine* by the Master of the Mint. Substances can generally be classified as *colloids*, or *crystalloids*—terms indicating the degree in which their solutions diffuse through a gelatinous stratum; and the Master of the Mint satisfactorily establishes the fact that all poisons of a soluble character are crystalloids.—Mr. Lewis, in a letter to Professor Tyndall, described an experiment intended to prove that the seemingly increased size of the sun when setting, and the moon when rising, is due to a mental effect caused by the instinctive focussing of the eye. Photographs of these luminaries obtained in juxtaposition with certain objects might perhaps aid in demonstrating this, the lens being an optical arrangement uninfluenced by mental efforts.—Geologists have been discussing Mr. B. Steward's theory (intended to account for the presence of flint instruments of human manufacture in the tertiary drift), and the probability of Madagascar and Australia having once been a vast continent of the secondary era.—The "toad-in-the-hole" (of the Great Exhibition) story has been the subject of much ridicule, since scientific men have demonstrated the simple impossibility of frogs existing for any length of time when placed in any vessel impervious to air.—At a manufactory of mineral waters at Leipsig it has been discovered that the now costly new metal, rubidium, can be obtained in large quantities from residues and sold at only *nine shillings per pound*.—Dr. Gladstone asserts that the spectra of the electric light produced by Professor Holmes's magneto-apparatus, between charcoal points, and a galvanic battery with M. Serin's lamp, are more extended at either end than the spectrum of ordinary solar light.—Mr. Crookes, a name well known to photographers, has unwittingly supplied several of our contemporaries with a new source of complaint against the Jurors' awards at the Exhibition. The *Daily Telegraph* says:—"Mr. William Crookes, the discoverer of the new element, thallium, and the exhibitor of several of its compounds, was passed over by the Jurors of Class II.; while M. Lamy, a Frenchman, who brought a specimen of thallium into the building about two months after it had opened, received the honour of a medal." As M. Lamy never pretended to have been the discoverer of thallium—but, on the contrary, in a paper read before the *Académie des Sciences*, awarded all the honour of the discovery to Mr. Crookes—this fact is the more offensive.

The month's artistic notes are but few. The collection forming the Campana Museum in Paris will not be exhibited in the Palace of Industry in the Champs Elysées after the 1st of November. Some valuable discoveries of ancient paintings have resulted from the excavations commenced at the subterranean church of St. Clement's Cathedral at Rome, and we hope to hear photographers there have at least secured negatives of such as are most fragile and perishable.—The Royal Academy has taken a step in the right direction by establishing an honorary retired class of Academicians, receiving each a pension of £100, and retaining their title, thus leaving room for others worthy of filling vacancies created. The Queen has graciously sanctioned the reform.—Mr. Penrose has liberally offered to aid in the decoration of St. Paul's with frescoes, by making himself responsible for the first series, which are to be painted on each of the eight spandrils between the arches of the dome. Chevalier Salviati, of Venice, commences the work with a head of St. Paul.—A monument has been erected at Fontainebleau to the memory of the French painter, Decamps.

R. A. S.

Scraps and Fragments.

A Sign of the Times.—A card-portrait of *Anonyma* has made its appearance in many of the shop windows, and is selling rapidly.

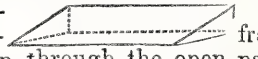
A Scientific Balloon Ascent is shortly to be made under the auspices of the Berlin Academy, after the plan of Mr. Glaisher's ascents.

King's College Photographic Classes.—The Lecturer on Photography at King's College, London, resumes his instructions this day to the classes under his tuition, and the laboratory will be open from this date.

Roman Photographs.—We are informed by the manager of the Polytechnic Institution that the collection of photographs executed by Mr. Macpherson, and which we noticed lately in these pages, has been removed from Conduit Street to the above-named institution, in Regent-street, London, where they are now on view.

Professor C. F. Himes's article in the *American Journal of Photography—On the Preservation of the Alkaline Gold Toning Bath*—gives some ideas to photographers which no doubt will benefit them. He urges them to restore the acidity to their bath, when done with for the day, by adding a few drops of hydrochloric acid. This will bring back the yellow colour and prevent the deposit of the gold. This has not been generally practised, and, doubtless, will be new to many who hear of it.

Coloured Albumen Prints, known as "Wenderotypes," are having an extensive run in America. The process consists, essentially, in so sizing the albumen-paper that the colours can be washed on very readily, and the brilliancy lost in painting is restored by a waterproof varnish which does not injure the whites. No doubt there are many ways of accomplishing the same result. Newman's preparation for albumen-paper answers well with some, and others are using borax and gum tragacanth, either with the paint or as a preliminary washing.

Printing-in Skies.—A sky graduating into light near the horizon is best managed by using the following:—Get a piece of stout cardboard and make it to resemble one of those writing-slopes used in offices, thus:—  After the print is taken from the pressure-frame lay this over it, and let the light steal in through the open part, graduating as it enters. Should you desire light clouds place a little wool of the requisite shape, for a longer or shorter period, on those parts of the sky in which you desire them, and then use the above simple piece of apparatus. The landscape must be partially covered.

South London Photographic Society.—We have been requested by Mr. Alfred Harman, the Honorary Secretary, to state that the Committee of the above-named Society have resolved that a dinner shall take place at the "Greyhound," Dulwich, on Saturday next, October 4th, to which the members and their friends are invited. Tickets will be supplied at five shillings each, until this day (Wednesday), Oct. 1st inst. As the number for whom dinner will be laid must be regulated by the number of tickets retained by members, all tickets not returned on or before this day must be considered as purchased. Members meet at two; dinner at four o'clock *precisely*.

Photography in Colours.—In our last we mentioned a rumour respecting photographs in natural colours submitted to the Jurors of Class XIV. at the Exhibition. This has since been illustrated by the announcement of its truth. M. Niépce de St. Victor had forwarded a dozen of such pictures, copies from coloured prints; but, valuable and interesting as such results may be, the photographing of coloured pigments and the photographing of natural colours are so widely separated as to lead us to hope for little practical good from discoveries in this direction. The process by which these proofs were secured is that which its author described in a memoir to the Academy of Sciences, and which was duly transferred to our pages shortly after.

Antiquity of Photography.—Our correspondent, Mr. Coleman Sellers, says:—An amusing anecdote has been told of one of Professor Emerson's children, which shows how the youthful ideas are influenced by the home talk. To the son of a photographer "taking a view of" means making a photograph, and does not convey any idea of seeing the view with the naked eye. But to the point. His son asked the other day—'Is the camera a very old invention?' 'Oh, no! quite modern,' his father answered. 'Why do you ask?' 'Why, because our Sunday-school teacher says that Moses went up into Mount Pisgah and *took a view of the Promised Land*.' Here, then, we have the first record of photography, just as the first record of banking is said to be when Pharaoh got a *cheque* [check] on the *Bank of the Red Sea*, crossed by Moses and Co. All trades and professions have their jokes and traditional anecdotes, and why not photography?"

Harrison's New Lenses (says our American correspondent), are at last in the market, and attract considerable attention. I allude to his globe lenses. A pair now before me, mounted for a stereoscopic camera, are attached to a rigid brass plate, which has a focussing-screw to adjust the two tubes simultaneously. Their staring glass eyes are well named "bull's eyes." In my own experiment with them I can best illustrate their angle of vision by stating that from the same stand point—as compared with a pair of Jamin's tubes, quarter-size portrait combination, with the hat-shaped stop used to convert them into view tubes—they take in, in three inches square, just four times the area of the Jamin tubes. Their focus is two and one-half inches, and they yield a circle of well-defined light five inches in diameter. Their reach is enormous, and they show no distortion of right lines in any portion of their field. With wet collodion they yield a picture, in bright sunshine, in from one to two seconds; and fine detail, in shadow, is given in eight or ten seconds.

Happy-go-Lucky.—The *Athenæum* says:—"The amended Catalogues of the Fine-Art and other departments of the International Exhibition are, at last, now published, after much delay. It is stated with regard to the corrected edition of the List of Awards, that certain amendments have been made in the same on revision of the jury-lists and minute-books, and certain explanatory awards have been made—if we may so style the newly-inserted items. So far as our own experience of the nature of the claims that have been recognised by the juries goes, it is such as to lead us very earnestly indeed to desire to learn upon what principle they have distinguished many favoured persons or articles. Upon those comprised in the title 'Art-Manufactures' the awards are, in a great number of cases, quite as inexplicable as the omissions. Without success, we have endeavoured to master the secret as relates to the works of Art in precious metals and in stained glass. It is clear to us, as it will be to others who study the question, that if one style of work is rewarded, another, directly antagonistic to it in principle, ought not to be so honoured; yet both seem distinguished, and, what is strange, not by the finest productions in either manifestation, but, generally speaking, inferior works to those left unnoticed. In some cases mere mechanical workmanship has honour denied to Fine Art, though both produced by the same firm in the same material."

Foreign Correspondence.

Paris, September 26th, 1862.

M. Roussin, a distinguished professor, has recently given publicity to certain experimental observations which are particularly interesting as bearing on the salts of silver employed in photography. While seeking to modify the proportion of iodide introduced into the albumen with which the glass is coated, M. Roussin remarked that the duration of exposure varied in inverse ratio to the quantity of iodide. The more iodide there is the shorter will be the time necessary for the exposure; and, on the other hand, if the quantity of iodide is much diminished and the exposure proportionally prolonged, we obtain pictures which are as vigorous as they would be with a larger quantity. Seeing this, M. Roussin asked himself whether the iodide of silver was indispensable to the formation of the image. So he took some fresh albumen, beat it up alone, and spread it over glasses which had been well cleaned. These were dried, put into a fresh eight-per-cent. nitrate of silver bath, washed for several hours, and dried; then they were exposed in the camera, and developed by means of gallic acid mixed with silver. Of course the exposure was three times as long as for iodised glasses. M. Roussin thus obtained images which were exceedingly vigorous and harmonious. None of them had that spottiness which so often spoils pictures on albuminated glass.

M. Roussin then tried whether certain salts of silver could not, as well as the albuminate, be reduced by gallic acid, under the influence of light. He found that the oxalate, tartrate, succinate, benzoate, carbonate, phosphate, and arsenite of silver are energetically reduced by a few seconds' exposure to the solar rays; and that these salts might be employed, just as the iodide of silver, with varying rapidity. It results, therefore, from these interesting experiments that the iodide of silver is not indispensable for the obtaining of images upon albumen, and that the albuminate of silver, carefully washed and dried, can, like the iodide of silver, be decomposed under the influence of light.*

* If our worthy correspondent will refer to the back numbers of this Journal, he will perceive that M. Roussin has been anticipated by English photographers *two or three years since*—especially by Mr. C. J. Burnett.—Ed.

A question has been raised, especially in England, as to the influence exercised by tobacco smoke on photographic preparations. The question is an important one at a time when the use of the cigar, the pipe, and the snuff-box is so widely-spread that little boys take to the habit as soon as they are weaned, I might almost say. On seeing some of our most active and careful photographers smoke in their laboratories and galleries, I have often asked them if they did not think that the practice had an injurious effect upon their operations. The answer they have given has been in the negative. However, M. Davanne, speaking on this subject in the *Répertoire de Chimie Appliquée*, gives a fact which deserves attention. One day a rapid process was being tried in presence of several photographers who were smoking. The laboratory was literally full of smoke. All the pictures were fogged. The next day M. Davanne well aired the operating-room, and tried the same materials. The pictures were all clean. "More recently," adds M. Davanne, "one of my friends and myself were developing with Taupenot's process in the same room, with the same materials, and under identically similar conditions. One of us, however, was smoking, and soon his developing bath got so covered with reduced silver that it had to be thrown away, whereas the other bath worked well. This anomaly ceased as soon as the smoking was desisted from." The experiment, you see, is clear; and, perhaps, in many cases no other cause need be sought to account for the failures that some photographers meet with.

On the 1st of October the *Comptoir Internationale des Photographes*, of which I have already spoken, will open an Exhibition of French and foreign photographs in one of the best quarters of Paris—the Rue Richelieu, near the Boulevard. The director, M. Potonié, requests me to announce this to English artists, and I do so with the greater pleasure as the idea appears to me to be an excellent one. At the London Exhibition I saw pictures which, if known and on sale in France, would be immensely successful—such as Mr. Wilson's sea views, Mr. Breese's moonlight effects, the landscapes of Mr. Mudd, and many others. I think, therefore, that such able artists would find it to their interest to respond to the call addressed to them by the *Comptoir des Photographes*.

A few days ago I had before me a specimen of a new process of photo-lithography—differing entirely, says the author, from all those hitherto employed. It was a very well-executed portrait. Unfortunately, I cannot give further details at present, as the inventor is not in Paris.

ERNEST LACAN.

Philadelphia, August 25th, 1862.

War! War! War! is the cry now as it has been for a year past; but now it comes nearer to our homes, as we bid God speed to our companions who are leaving us. The streets are filled with bright uniforms, and the photographic galleries are crowded with soldiers and their friends. What a blessing it is that they who go to the wars can not only leave behind them their images, but take with them the semblance of those they leave at home!

Regarding dry photography our amateurs are now at work with their cameras in all directions, and are, no doubt, laying up a good stock of negatives for the winter printing. I can say but little about the formulæ in use among them now. They are all experimenting. Some stick to the malt *process* through thick and thin, and others are as earnest for tannin in its "Simon Pure" state. Then we have the operators with tannin and honey, and tannin and malt combined, and tannin fixed with ammonia before or after exposure. Besides all this Mr. Shriver, of Cumberland, Maryland, hints at some quick dry-plates by a modification of the tannin somewhat different from any of the above.

Mr. H. T. Anthony, the "irrepressible experimentalist," as Thompson calls him, was quite full of caramel some time ago, and tried caramel and tannin, previous to a notice of that combination appearing in one of the English journals. He says that tannin, *per se*, is very apt to develop a halo around the high lights, and that this is more apparent when long exposure and small stops are used. He thinks the use of caramel tends to remedy this evil. I believe the idea is to flow a weak solution of caramel over the plate, and, after giving it a little time to penetrate the film, to wash it off again, and then apply the tannin as usual. He writes, in a recent letter, on the subject of milk plates, which have done such wonders both in his hands and in Mr. Thompson's:—"In using milk plates do not develop with citric acid, and, above all things, do not attempt to follow the suggestion of a recent writer in one of the journals, and flow a solution of acetic acid over the plate after washing."

As an instance of the solar camera in scientific hands I would mention that Dr. Charles M. Cresson, assistant engineer of the Philadelphia Gas Works, has had one built, and will soon report his experiments with it: he has a reflector on the Woodward plan, and is designed to test its value by careful experiment. Dr. Cresson has been for years an ardent amateur photographer, and, as recent testimony in court shows, he was the first one in America who made a picture on collodion. His experiments during the past year, however, have been more with lime light than with photography, and his apparatus for the exhibition of lime light in connexion with the compound microscope, and also the magic lantern, are said to be the finest in America. He uses street gas in combination with oxygen; both, however, being used from rubber bags, and forced out under very great pressure. His favourite dry-plate in photography is the tannin and honey, on which kind of plate he has produced much good work. His fancy has been for very large pictures, and he has been very successful with 18 × 22 plates, both dry and wet. He is a good illustration of the fact that the more a man has to do the more he can do; or, as an eminent lawyer once said, "When I want a favour done—some information given in the scientific way—I do not go to your man of elegant leisure: I go to those who have the most to do. The very busy men are the very ones who have time to do still more, and to do it willingly."

The Rev. Mr. Hill, who was to have given the world the grand secret of photography in natural colours, has come to light again—an alleged libellous article in one of the American journals having called him forth. If matters are pushed to the end he threatens, we may have some little spice of law to give zest to photographic news.

September 8th, 1862.

With the intense anxiety all have felt during the past two weeks concerning the troubles of our government, it has been almost impossible to concentrate one's mind on the ordinary routine of business life, and still less on those things which are looked upon as our subject of thought for moments of leisure. Men, who have been wont to meet and exchange their opinions on scientific matters—men, whose attractions for each other's society have been mainly from kindred scientific hobbies, now meet to talk of war. War has been the theme of all conversation in all places. We read of it in the morning papers, and talk of it at the breakfast table and all day long. "Have you any news?" is the constant greeting. Never since my first letter was published in The British Journal of Photography has my pen been taken up with so little real interest in the subject to be written about as to-day. With this confession as a preface, I hope my readers will pardon my shortcomings now, and receive my promise to do better in future.

Photography, in a business point of view, has been benefited by our troubles. The dealers in photographic stock and instruments are at their wits' end to meet their orders, and all the galleries are crowded with visitors.

Last week Mr. Carl Mienerth, of Portsmouth, New Hampshire—whose name is known to the readers of the American journals—passed through Philadelphia on his way to Chicago, Illinois. He spent two days with your correspondent, dividing the time between photography, music, and flowers. Music was his profession; floriculture was his hobby before photography drove the flowers away; and now his last pastime has overcome all others, and has become the business of his life. It is very pleasant to meet with those whose names are familiar to us as writers, and to see what they look like and to hear them talk. Mienerth seemed glad to visit a warmer country than that which has been his home in America. He complains of the coldness of the climate and the coldness of the people: he could find no enthusiastic companion. Proposing to him, some time ago, to send us some snow pictures—some ice gems for the stereoscope—he wrote:—"Yes, certainly, but I tell you it has not that charm for me to take ice here, where we have eight months full of it, as it would to take a batch in a Brazilian forest, or a cactus thicket in Sierra Neveda. The country here is now (November 28) covered with snow, and it feels as if that snow will have no chance of melting until about next fourth of July; and, *apropos*, the people are about the same. Good people they are, indeed, just like the air they breathe—salubrious; but cold, awfully cold and stiff; no congenial warmth of heart, no sentiment, no soul; all is cold calculating matter. When I speak to one of them with enthusiasm of my photographic experiments and experiences, the only sympathising question I receive is—"Isn't it expensive?" So he was glad to see southern flowers in bloom and to find men who could value his enthusiasm. We made some prints, and he toned them with gold he brought with him, and which had been made by dissolving a gold wire in aqua regia, and

then putting salt into the liquid until the salt was so much in excess as to soak up all the fluid. This saturated salt was then dissolved in water and was ready for use. He toned in a bath of phosphate of soda and this gold of his, and very fine blacks and clear whites were the result. He tells me he keeps the old bath, and adds more gold from day to day.

Mr. Borda, too, was in Philadelphia some days ago. He purposes removing his family to this place, and was house-hunting at the time. He will be a valuable addition to our Philadelphia society. Speaking of society, there has been some little talk about starting a photographic society here when the political horizon has cleared up and the war is over. Then it will give me great pleasure to report the proceedings of it for our transatlantic friends. Borda had been off to the lakes of New York with his camera, and had brought home some fine views. He uses one of Harrison's new globe lenses—*i.e.* a pair of them—and it is good to hear him praise them. These new lenses are getting more plentiful in the market now, and I have not yet heard a word of complaint about them. The makers of them say that, in a few days, they will have one of twelve-inches focus, which will cut a square picture 17 × 17 inches. Mr. H. T. Anthony sent me, a few days ago, a picture made on one of his milk plates with these lenses, and it bore ample testimony in favour of both the process and the instrument. It has been proposed to use these instruments with the solar camera, as enabling an instrument for large work to be used in a small space. Borda is quite enthusiastic about Anthony's process of fuming tannin plates with ammonia. He expressed regret, too, that one of the American journals should have spoken of the process as Borda's, when he had distinctly declared, in his article on the subject, that the idea originated with Mr. H. T. Anthony, and was published by his permission. To Mr. Borda, however, belongs much credit in the experiments.

Mr. Anthony says that a plate which has been rendered quite insensitive by washing in chloride of sodium water has its sensibility restored by the fuming, and, at the same time, much of the tendency to solarise, so common to dry plates, is destroyed.

Mr. Creemer, of the International Stereoscopic Company, has just published some views of the interiors of our army hospitals, which will be interesting as records of these troublous times.

The Sangenhiem Bros. are still busy with glass slides for magic lanterns, and their photographic slides are taking the place of all others in the market. Besides their large stock of views and objects from nature, they have painted in Indian-ink a series of pictures with a moral attached to them, such as the *Drunkard's Progress*, and similar subjects: their Indian-ink pictures are copied by the camera, and glass slides are printed from them for the lantern. I have seen many of their tannin negatives, and they speak very well of the process, saying that with them it is very quick. I know not if they have any peculiar way of preparing their tannin plates.

The 15th day of September is fast approaching; and, besides having an interest in a photographic point of view—as it is the next day of exchange for the Amateur Photographic Exchange Club—it is the day fixed for the draft to begin, and some of us may have to drop the camera for the musket. Speaking of this draft, some facetious writer calls it the "Great American Consolidated Lottery: every fifth ticket a prize. It will be seen that every fifth ticket will be safe to draw a prize, valuable inasmuch as every prize entitles the holder to a splendid fowling-piece, game-bag (knapsack some call it), a pair of blankets, a full suit of clothing, and a due bill of the association for nine months' board." See how easy it is to wander from what one should write about to what one is thinking and talking about! "If I'm not drafted" is the prelude to all calculations for the future; so, if I am not drafted, I hope to find more interesting matter for my next letter to THE BRITISH JOURNAL OF PHOTOGRAPHY.

Now, a few words about solar cameras.—For want of knowledge of my own, I must relate what has been told to me. One who has made a business of making and arranging solar cameras tells me that, when his attention was first directed towards enlarging, he placed a negative so that the sun could shine on it and then pass into the copying-tube, and be enlarged on the sensitive paper just as the solar camera now is, minus the condensing lens. He could do no good work in this manner at all, so he added to his instrument a five-inch condensing lens—which was in reality no larger than the negative from which he was printing—and yet this addition enabled him (using direct sunlight and no reflector), to print very satisfactory pictures. He avers, from actual experiment and long experience, that the condensing lens is an essential part of the solar camera; that it is one of the lenses in the series, and performs a function in the optical arrangement quite different from the mere illumination of the negative.

Seemingly in support of the above, I might revert to what Dr. John Dean, of Boston, told me, and an account of which appeared in one of my letters to this Journal, viz:—that, in enlarging with his microscope, he used a three-inch objective; that he had had trouble with the field not being properly and uniformly illuminated; that there seemed to be a bright centre to the field, and a darker margin. From Professor Rood he received the suggestion to place a common burning-glass before the object, so as to condense the rays into the enlarging tube. He did so, and had no more trouble. I remarked to him that I presumed he got more light thereby. He said light was not what he wanted: he had enough of that before. What he wanted was evenness of field, and the condensing lens gave him this.

Professor Rood's own statement seems to confirm this, and the diagram published with one of my letters at the end of a quotation from his letter, shows an arrangement substantially the same as all solar cameras using the condenser.

In regard to the use of a chromatic condenser affecting the chemical focus of the copying tube, Mr. Wenderoth, who uses an eighteen-inch achromatic condenser, says he has now satisfied himself from actual experiment that it does not influence it in the slightest degree; and I am rather inclined to believe that he likes his old chromatic condenser quite as well as his new and very costly double one. Blisters begin to show in the balsam, and, no doubt, he will soon have to renew the cement.

COLEMAN SELLERS.

[The letter of our correspondent intended for our last number arrived a day too late.—ED.]

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

BROMIDES IN COLLODION.

To the EDITOR.

SIR,—The experience of your correspondent, Mr. Webb, on the much vexed question of bromides *versus* iodides is, in the main, similar to my own experience, so long as I thought the nature of the bath was of little importance; and, as he has not thought fit to enlighten us on this point, we may safely conclude, from the results he has recorded, that the acid employed in his bath was acetic acid.

Now, if Mr. Webb, or anyone else who is experimenting in this direction, will apply the tests to which I subjected the matter, and which you were good enough to copy into your Journal, they will find the wonderful discrepancy on this matter is entirely set at rest, and that when bromides are used in collodion, nitric acid must be used in the bath, *i.e.*, if the full advantage of bromides is to be realised. With acetic acid in the bath, there can be no doubt—at least I have none—that *iodised* collodion is quicker in action, and produces a far better quality negative than a bromo-iodised collodion in the same bath.

I do not know whether I have been the first to point out this important fact, as I am too fully employed to read all that is written in the various journals devoted to photography, nor is it a matter of any importance whether I am first or last; but it is of importance that experimenters in writing on this subject, should not leave out of their statement the nature of the bath they employ.

Since my experiments were made I have had ample confirmation of the truthfulness of the results—far beyond any anticipations of mine: many operators, writing to thank me for the new bromo-iodised collodion, state that they can now get instantaneous portraits in their glass-rooms under favourable circumstances of light, and with a short focus lens.

As I am committed to a letter to you, I may as well notice your remark, "that you did not remember seeing any works of mine at any of the Exhibitions." I could not help smiling at the short-lived fame of my earlier efforts, since I have now to tell that I was an exhibitor, and not an unsuccessful one, at the three first photographic Exhibitions; and, as near as I can now recollect, the number of pictures on each occasion varied from twelve to twenty, and were at the time kindly noticed, and met with a ready sale. Since then, as you rightly conjectured, the photographic public have compelled me to devote my time almost exclusively to the supply of their wants, and I have had but little time to devote to my own amusement with the camera, either in or out of doors.—I am, yours, &c.,

THOS. C. PONTING.

Sept. 25, 1862.

To the EDITOR.

SIR,—Mr. Augustus Webb, in his communication on this subject in your last number, page 358, has omitted to state the composition of his

silver bath; and, as the whole question hinges upon whether the bath be acidified with nitric or acetic acid, the results reported by him are without value. Judging, however, from those results, I think it clear that acetic acid was used, as they could not have been produced by nitric acid in the bath. With bromo-iodised collodion, nitric acid acts as an accelerator, and acetic acid as a retarder. The composition of the nitrate bath is therefore a most important feature in the question, as respects *rapidity of result*, it being imperative that the amount of nitric acid it contains shall be nicely proportioned to the amount of bromide in the collodion. I would recommend to Mr. Webb the perusal of what Mr. Ponting says on this head in his recently-published pamphlet.

There is another very important consideration which cannot properly be omitted in any investigations of this subject—I mean the mode of making the pyroxyline. It has, by recent experiments, been proved that a pyroxyline can be prepared with which a simply-iodised collodion can be made producing all the effects of bromo-iodised collodion. This I state as a fact, and a most important one it is. Such a collodion is now extensively sold to the public, who purchase it fancying it contains bromide, though it is not announced or sold as bromo-iodised collodion. I mention this to show how necessary it is to ascertain with exactness the chemical composition of the pyroxyline before instituting experiments with bromides and iodides; and also that it is equally necessary to use *a different bath* for each change in the proportions of the two salts, if results of any value are to be arrived at. If Mr. Webb will act on these hints, and favour us with the conclusions they lead to, he will be doing good service to photography.

I have no time to enter further into the subject at present, and write this hurriedly at a Cornish Inn, being on a photographic tour in that part of England. The question, however, appears to me sufficiently important to warrant a few remarks, which I trust will not be made in vain.—I am, yours, &c., AN AMATEUR.

September 20th, 1862.

PURE WATER AND TONING.

To the EDITOR.

SIR,—I have read with much interest your remarks on the purification of water, in the leader of the 15th ult.

As distilled water is a very large item in the expenses of the photographer, it would be a great boon if water purified by Condy's solution were fit for all purposes. May I ask (as I am no chemist) if I may safely use ordinary water (Kent Water Works), purified by the above solution, not only for developing solutions, but for nitrate baths? As there appear to be more solutions than one, will you tell me what I should ask for at a shop in order to obtain the proper one for my purpose?

I was rather startled, on looking over the volume of the Journal for 1859, to see the following toning bath recommended (page 61) as being "as sound in theory as it is good in practice":—Water forty ounces, hypo. nine drachms, sulphuric acid thirty-six minims.

As it seems to offer a saving of both trouble and expense, I should like to have your opinion of it, as my photographic reading teaches me to avoid toning by sulphur, like poison.

I should say that the prints are to be fixed in the ordinary bath before toning; perhaps that may alter the case.—I am, yours, &c.,

September 25th, 1862. F. L.

[You may safely use water, purified as directed, for all your photographic operations. You should ask for Condy's pink solution: it is the permanganate of potash. The article to which you allude was contributed by a writer then connected with this Journal. The recommendation given was not one which ever met our cordial approval, though at that time we had not quite so strong an objection to it as we now have, subsequent experience having more than confirmed the impression we personally entertained of its want of stability. Be it understood that sulphide of silver alone is a stable compound—hence the opinion of the author that "it was sound in theory;" but he did not know, and others only suspected, that the presence of organic matter, as of necessity there must be in a paper photograph, totally altered the conditions, and made such a compound particularly *un*stable, especially in the presence of moisture.—ED.]

A SUGGESTION.

To the EDITOR.

SIR,—THE BRITISH JOURNAL OF PHOTOGRAPHY now boasts of its French and American correspondents—our own metropolis being ably represented by our gossiping friend, and its current events duly registered by the staff. Why, I ask, should there not be added to its columns communications from its "country correspondents," whose name I doubt not would be "legion," if it were once known that a corner should be specially devoted to their experiences or, possibly, grievances? for you are aware that among every class grumblers are to be found, not excepting that represented by the proverbially good-natured photographer. It might be urged by a cursory observer that the general correspondence now fulfils everything required by your country cousins; but, on a more careful survey, the amount of information conveyed by the writers themselves is very limited indeed.

There are many reasons I could advance in favour of my proposition; but, perhaps, one is sufficient. I am assured that the body of our fellow-labourers in the country would be many times tempted to throw out useful and practical suggestions in this form, when they would never dream of clothing their thoughts in a prosy paper.

The only thing I fear would be the result which would accrue to yourself. Your correspondence, &c., must be voluminous enough at present—and it is our interest not to drive you to distraction by increasing the same.

I have no doubt there are many gentlemen sufficiently competent and disinterested willingly to take this labour off your hands. Of course much rests with the publisher, as to whether he will undertake to find space; but of one thing I am certain, that if it could be accomplished a great deal of information now lying dormant would become public property, and your Journal become increasingly popular.—I am, yours, &c. DICKEY SAM.

[We are at all times willing to meet the views of our readers, if practicable, and therefore publish your letter in order to ascertain whether it meets with a response.—ED.]

"INSTANTANEOUS SHUTTER."

To the EDITOR.

SIR,—Mr. Petschler has fallen into a very great error in the construction of his instantaneous shutter.

For taking objects in rapid motion, such as vehicles in crowded streets, &c., it would be perfectly useless, owing to the two lenses NOT being exposed at the same time, or rather I should say, the lower half of one lens being opened simultaneously with the upper half of the other.

For instance, if it is desired to take a picture with something moving in the foreground, when the shutter is turning round and exposing the foreground to one lens the object would be in another place and position by the time the lower part of the other lens was opened, and, of course, the resulting picture would be useless for stereoscopic effect.

I know the time occupied in turning the shutter is extremely short; but still, if it is necessary to give such a short exposure to prevent the image being blurred, it is equally important that the two pictures should be taken at exactly the same time.

Trusting I have fully explained my meaning,—I am, yours, &c.,

Peckham, Sep. 10th, 1862. ALFRED HARMAN.

[Your meaning is clear enough, but you will find that if the shutter be in pretty close proximity to the front lens of a double combination, or the stop of a single one, the defect you apprehend does not occur.—ED.]

A FALSE CHARGE AGAINST FIVE BATHS.

To the EDITOR.

SIR,—Many thanks for your kind reply to my inquiries in No. 171, page 301, in which I should have stated that all my baths were made up slightly acid. Now, as my failures have been referred to in the following number by "I. T. R. Y.," I consider it my duty to him and all young amateurs to say how my failures occurred. I commenced with a good supply of fresh chemicals, and with these my failures commenced. Considering the fault lay in the silver or collodion, I got down a second supply, and a third. I now thought it time to write to our worthy Editor. Up to this time I wished to overcome all failures, if possible, myself, even at some cost; but at this time it failed me.

While awaiting the reply I took a look over Journal after Journal. At last I came to one instructive reply to a correspondent which struck me forcibly—that is, "he should look to his lens in case of reflected light from the brightness of the interior." I dropped the Journal, took my lens and examined it, and bright it was. I lined it immediately with black velvet, took the first bath and collodion that failed first, went once more amongst the old ruins, planted my camera, and the first negative plate exposed was perfect. So on from the first bath to the fifth: were all in perfect working order. I have not used them since, as I have been otherwise engaged. Time did not permit or I should have given the above much sooner to "I. T. R. Y."

I hope, Sir, I have not trespassed too much on your valuable time and space. The above is at your service, should you consider it worth insertion.—I am, yours, &c., T. G. P.

Trim, Meath, Ireland, Sept. 10th, 1862.

CHEMICAL AND OPTICAL QUERIES.

To the EDITOR.

SIR,—Will you kindly assist me by answering the following queries?—

1. Will *methylated* alcohol do for developing solutions in collodion glass positives?

2. In what way can I separate nitrate of silver from nitrate of copper in solution? I dissolved the silver in nitric acid and precipitated with a piece of clean copper, but did not succeed well.

3. Is *acetate* of soda better than *carbonate* of soda in gold-toning solution? and is it *subcarbonate* or *washing* soda that is meant? From uncertainty of whether it is *bi*carbonate or carbonate that is intended, I am in doubt which to use.

4. Can I find the exact focus of my lens by directing it towards the sun and letting the light pass through and fall upon a black board, then measuring from the back lens when the disc is smallest?

5. Supposing the focus to be twelve inches, can I insert (when the twelve-inch combination is taken out) an eight-inch combination to work well?

Hoping you will enlighten my ignorance,—I am, yours, &c.,
A YOUNG AMATEUR.
Knockby House, Waringstown, Ireland, 23rd September, 1862.

[1. No: it is apt to injure the colour of the reduced silver.

2. The usual way of separating the nitrate of copper from nitrate of silver is by fusing it strongly, so as to decompose the copper salt, and then recrystallising the silver salt; but if there be but a small quantity of nitrate of copper present, it is stated by some operators to be quite inoccuous, and may therefore be disregarded.

3. We do not consider acetate of soda to be preferable to the carbonate in toning. You can use either the carbonate or bicarbonate, but the latter by preference.

4. You can find the distance of the principal focus from the back lens by this means, but not the *equivalent* focus, if that is what you mean.

5. Unintelligible. Insert it where?—taken out of—where?—Ed.]

GURNEY'S AMERICAN COMPOUND.

To the Editor.

Sir,—In reply to "Mary B——'s" query as to the composition of the aforenamed excellent sensitising compound for the Daguerreotype process, I believe she will experience no great difficulty in its manufacture by proceeding thus:—

In a dry bottle put

Hydrate of lime	1 quart.
Iodine, pulverised	8 grains.
Burnt alum, powdered	3 drachms.
Chloride of lime—as much as will lie on a threepenny piece.	

These should be thoroughly mixed. Indeed, in order that the iodine should be quite incorporated with the lime, it is better to allow them to stand for a day before completing the mixture, which is done by adding pure bromide in such quantity as to make the compound of a pale red colour.

This seems to improve by keeping. The best way to use it is to iodise the plate to a decided yellow, then over the sensitiser to a red, returning to the iodine for a few seconds.

The tone of the resulting picture is very fine, the whites being pure, the blacks intense, and the intermediate tints in their proper gradation; while its sensitiveness is all that can be expected.

Another accelerator, producing good results, is composed of equal parts of lime and powdered starch, with bromine added as above. These dry accelerators are much to be preferred to aqueous solutions of bromine.—I am, yours, &c.,
J. T. T.

PRESERVING SENSITISED PAPERS.

To the Editor.

Sir,—As the dull weather is now approaching, in which photographic printing becomes a very precarious piece of business, and a great deal of sensitive paper finds its way into some corner as worthless, it would be a boon to many a *carte-de-visite* photographer if you would, through the medium of The British Journal of Photography, endeavour to elicit the best method of preserving sensitive photographic paper.—I am, yours, &c.,
W. BARRACLOUGH.
September 11th, 1862.

[We do not presume that our correspondent is ignorant of the various contrivances for the purpose specified that have already been introduced, but that he desires to invite the expression of opinion, based upon experience, of their respective merits, as well as new suggestions for effecting a similar object.—Ed.]

ANSWERS TO CORRESPONDENTS.

*** We have to crave the indulgence of several contributors, whose articles are unavoidably postponed for want of space.

A. C. S.—Received.

J. T.—Received with thanks.

Old Boy.—Not till November.

J. G.—Received: declined with thanks.

F. P.—The best we can do for you is to maintain a *discreet silence*.

M. T.—See reply appended to note by F. L. in the present number.

Φ.—You had better use a single combination for the purpose you name.

C. Bailey.—The mottled appearance of your proof is due to the nitrate of silver bath being too weak.

Chas. Gumm.—The sixth edition of Hardwich's *Manual* is the best work on the subject yet published.

Rudolph.—We cannot reply privately; but will do so through the Journal, if you send the queries and a specimen of your failures.

Reuben.—Quite a mistake. We have taken the chestnuts in bloom many times, and have no doubt that others have done so likewise.

The Amended Awards of Jurors in Class XIV.—When we are satisfied that the awards are finally amended we shall give the *correct* list.

R. F. T.—Methylated spirit will do very well for the spirit lamp, and we do not see any objection to its use for a negative varnish; but for collodion it is quite inapplicable.

J. Smith (Sunderland).—We have an article already in MS. for our next that will afford the desired information, which would take too much space to give in this column.

G. Loader.—We have long since arrived at the conclusion that, for convenience and lightness, no "changing box" is equal to a number of double "backs," if properly made.

A. H. Scott.—We are pleased that you are gratified with the articles named. Respecting the other matters, we have no intention of continuing the controversy; our object was simply to obtain redress for a great injustice which we suffered. Any further measures we take will be by an appeal to the law.

J. S.—A very convenient and cheap form of stereoscope was exhibited at the meeting of the North London Photographic Association (see report) that exactly fulfils your requirements. It is made by Anthony, of New York, and we have little doubt that you could obtain one from Mr. Atkinson, of Liverpool.

A Bath Brick.—You may rely upon it that the gentleman you name knows very well what he is about, as you conjecture. The caviller would have shown much more judgment had he first considered that one holding the position filled by the gentleman he so rashly criticised, would not have been likely to have promulgated such a statement without good reason.

An Old Subscriber.—We have an article in preparation upon one of the subjects to which you allude: it will appear in an early number. As to the other one, the process is now almost obsolete, and we do not think it would interest our readers generally; so that we must refer you to a little pamphlet by Mr. How for the information you desire. Except as a matter of practice we cannot recommend you to go into this branch of our art.

Bernard.—1. The photograph received (a card-portrait) is not good in position so far as the lower part of the figure is concerned; because the lady appears as if standing, though really sitting. From the waist upwards the pose is good.—2. The photographic manipulation is faulty only in there having been too short an exposure in the negative and slight over-development.—3. The tone of the proof is good.—4. Background not too dark.—5. We have no means of deciding absolutely whether the print has been sufficiently washed: for aught we can tell to the contrary it has.

Clericus.—Your brevity is perfection, were brevity needful. We had some doubts whether the use of resinised collodion would not disorder the bath by the introduction of detrimental organic matter into it; but Mr. Corey, Mr. Glover, and others who have worked the process, affirm that in practice they do not find any inconvenience therefrom. As an iron developer, without acid, for any further intensifying of the image, a solution of one part of acetate of soda, to two parts of proto-sulphate of iron has been employed; say to each ounce of water, eight grains of the former to sixteen of the latter.

A Beginner.—The bad colour of your prints is due to insufficient toning with a salt of gold, and this is brought about partly by want of sensitiveness in the paper: you want a stronger solution of silver to sensitise the paper, and *possibly*, another sample of paper more highly salted. The pose of the lady is absolutely dreadful: did you ever see a lady stand in such an attitude without being placed in it? If you do not know how to arrange her better than that, go near to her and talk to her for a few moments, get her to remain in any attitude that she naturally assumes, and then proceed to the camera; if her head is turned too much away, ask her to move the head about until you can see the features favourably. This may not get a good pose, but it must be better than what you now have.

H. Robinson.—We admit the practice adopted by some of our French brethren, of quoting the strength of solutions at so much *per cent.*, to be somewhat puzzling to an Englishman, but cannot concede that it is at all a foolish practice, as you designate it; because, with *French* weights and measures—which are divided upon the decimal system, and are also dependent upon one another—the use of such formulæ is simplicity itself: it is only our own clumsy arrangement that complicates matters. However, if you multiply the *per centages* quoted by *five*, and take the product for the number of *grains* to be dissolved in each ounce of liquid, you will be very near the mark: if you want to be very accurate you must multiply by 4·8 instead, and add the resulting number in grains to each fluid ounce of water, *minus* as many minims as there are grains of the salt. The calculation is simple enough when you once know how to apply it.

A Dullard.—The specimen No. 2 shows the dirty corner to arise from an excess of the nitrate of silver which has drained down during exposure. This, not having become freely mixed with the developer, in consequence of absence of continued motion while developing, has become partially reduced, and therefore has made a stain. Remedy: Touch the corner, before pouring on the developer, with a scrap of *clean* blotting-paper. Your proofs are not printed deeply enough to begin with, and the negatives are evidently faint ones; but the red tone of the simply washed ones indicates too much acidity in the paper sensitising bath. If you refer to Mr. Dawson's article, p. 266, you will perceive this notified. Again: the time of immersion in the toning bath has not been long enough: on this point see p. 284, same article. Lastly, if you find the toning bath slugglish in action, warm it. With regard to the elementary writer you name, we must "wash *him* out" altogether, and begin *de novo*. We have been contemplating the production of a series of the kind for some time past; but other matters have been more pressing.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 176, Vol. IX.—OCTOBER 15, 1862.

The Solved Problem.—The degree of success attainable in the pursuit of self-deception, if attempted with earnestness, is truly astonishing. In another column will be found a paper read before the members of the British Association for the Advancement of Science, at Cambridge, being a *Description of a Rapid Dry Collodion Process*, of which Mr. Sutton is the author; and though but a short one, in it he has contrived to insert several assertions which positively court hostile comment. He says:—

"The problem which has most interested photographers of late years has been the discovery of a dry collodion process by which plates can be prepared as sensitive as with wet collodion. * * *

"I have lately solved this problem of rapid dry collodion. * *

"The rapidity of this dry process depends upon the accelerating effect of bromine in dry collodion. * * The principle, therefore, of preparing a rapid dry collodion plate consists in using bromo-iodised collodion, and removing all the free nitrate, which is the element of instability."

This is rather amusing from one who was only a few months back arguing in the most determined way that the action of bromides in collodion is a retarding one under nearly every condition; but we should not have adverted to a sudden change of opinion alone as the simple result of conviction, on this or any other subject, were it not accompanied by the cool assumption of the "discovery" of a fact that has been pretty extensively admitted by a large number of photographers for some years past, and more than this, the recognition of which has been literally forced upon its "discoverer."

Now, so long back as in the month of February, 1854, the accelerative effect of bromide in collodion was regarded as unquestionable by Mr. F. Maxwell Lyte and Dr. Diamond at least—evidence of which may be found in *Notes and Queries* for February 18th of the year quoted, wherein the former writes:—

"I feel certain that on a strict adherence to the correct proportion depends all the success of photography; and as we find in the kindred process of the Daguerreotype that if we add too much or too little of the bromine sensitiser we make the plate less sensitive, so in this process."

We may remark, *en passant*, that the proportion recommended is one of bromide to four of iodide, of the same base, by Mr. Lyte; Dr. Diamond directing one of bromide to six of iodide.

In this Journal for the 1st of June, 1858, pp. 137 and 138, there is recorded a paper, read by Mr. Charles Heisch at the Blackheath Photographic Society, in which we find the following conclusion:—

"What I assert is, that when combined in proper proportion with bromide, it (the iodide) *is far more sensitive*."

Of late, the question of the greater sensitiveness of the bromo-iodised collodion has received considerable attention, and articles on the subject have been published by Mr. V. Blanchard, Mr. England, and Mr. T. C. Ponting. It may possibly be contended that these refer especially to wet collodion, and that it does not of necessity follow that the exaltation of sensitiveness should be found in dry plates also, consequent upon the addition of the bromide; but if so, this remark would scarcely be applicable to Mr. England's paper, which does treat of dry plates as well as wet ones; and, though he lays no claim to dry plates prepared by his formula being fit for instantaneous work, he does put it forth as a "rapid process." But the recognition of the advantage of the combination of an iodide with a bromide, or some other salt of silver than the nitrate, for dry collodionised plates has been so generally and so frequently expressed at the North London Photographic Association, and elsewhere, as almost to have assumed the form of a conviction of its *necessity* in order to ensure the impress of any image on the dry plate from which the nitrate of silver is absent; while its accelerative action has been matter of controversy. All these facts have been matter of public notoriety.

With regard to the necessity for the removal of the nitrate of silver, we do not presume that to be claimed as a new discovery, though the following (after allusion to the use of preservative coatings, in order to gain intensity) presents very much the aspect of such a claim:—

"One more difficulty remained to be overcome, and it is this. When a collodion film has once been allowed to get dry, and is wetted a second time, it is very liable to split and leave the glass; or, if a preservative has been applied to it, it is very liable to rise in blisters, which spoil the negative. But this may be prevented by giving the glass plate a preliminary coating of India-rubber dissolved in kerosolene."

We fancy that this plan is not exactly new, any more than the use of gum-arabic as the preservative coating. We believe that Major Russell employed a thin film of caoutchouc for the preliminary coating before he finally adopted the use of gelatine; and we know that our friend, Mr. Hardwich, resorted to both gum-arabic and caoutchouc in dry-plate photography.

Dr. Norris's labours are altogether ignored, possibly upon the ground that he has not made his process public; but, with such striking results as have been attained by the use of his extra-sensitive dry plates, some mention of their existence might have been expected from one who considers it needful to inform his auditors that "with wet collodion the tourist is therefore obliged to work in a van or tent, and carry a load of paraphernalia about with him"—a piece of information scarcely requisite for photographers, and therefore addressed to those who would otherwise be apt to imagine that the author of the paper had, in his preparation of "*rapid*" *dry* plates, been the originator of such convenient adjuncts to the comfort of the photographic tourist. Relative to the merits of the formulæ given we express no opinion, assuming that when intelligently applied they lead to the results anticipated. We cannot pass over such an utter disregard of the labours of other photographers as that implied in the sentence, "*I* have lately *solved this problem*," without a protest on their behalf, even though we thereby arouse a storm of wrath heavily laden with the thunderbolts of vituperative epithet.

ON INSTANTANEOUS PHOTOGRAPHY.*

By John Kibble.

At our last monthly meeting I promised, on some future occasion, to offer a few remarks *On Instantaneous Photography*; also to exhibit some specimens obtained with the No. 3 Aplanatic View Lens, made by Mr. Grubb, of Dublin, so that you might be enabled to judge for yourselves as to its capabilities. In addition, I have

* Read at a meeting of the Glasgow Photographic Institution, Oct. 2, 1862.

brought one or two results by his E stereoscopic arrangement. But previous to producing the photographs, I wish to enter into a few particulars regarding the mode of producing such results generally.

To prepare the nitrate bath:—A saturated solution of metallic film in nitric acid to be boiled in contact with a surplus of the metal for an hour or two, when part of the nitric acid forming the nitrate is decomposed, a portion of its oxygen combining with the silver, the salt becoming the hyponitrite of silver, a much more unstable body than the former. A sensitising bath composed of one part of this to three of the fused nitrate of silver is very active; and, if properly prepared, should show an immediate alkaline reaction with litmus-paper. From the time it is once used it rapidly deteriorates for instantaneous action, but still may be considered quick for ordinary exposures.

The bath prepared with the following proportions is what I use: forty grains of the mixed salt to one ounce of water, saturated with freshly precipitated and thoroughly washed iodide of silver, which, after settling and then being decanted, is ready for use. The less you filter through paper the better. The above over an iodide silver surface is highly sensitive to the actinic rays, but, at the same time, I must confess a little troublesome. The extreme of cleanliness is absolutely essential; also manipulating with the least quantity of light possible, otherwise fogging will be the result.

Another very important point in developing is not to allow the fingers to remain long in contact with any one portion of the plate, but to be continually shifting, as a very few degrees of additional heat communicated will cause a more rapid development at the points of contact. One quarter of an inch all round the plate is quite as much as any good photographer ought to allow, or less. The developer:—Ten grains protosulphate of iron, five drops of acetic acid, and five drops of alcohol to one fluid ounce of water: less of the two latter if the size of the plate will admit of being expeditiously and evenly developed without.

In very rapid exposures, as a rule, the image makes its appearance so slowly that the silver necessary for the building of the image is generally reduced from the nitrate by the chemical action of the protosulphate of iron, long before the very delicate tints so necessary to the beauty of the photograph have become apparent; hence a second, and, in many instances, five or six, additions of the developer are resorted to.

To prevent deposit, the exhausted developer is washed off the plate previously to adding more; but a much better arrangement is to have several vessels charged with the exact quantity of acetonitrate of silver in each, so that, should all the details not make their appearance, the protosulphate of iron can at once be added to one of the vessels, and the plate well flooded over in a manner so as to wash off all of the exhausted developer before it, and so on in rotation with the whole series if necessary.

Practice has already informed us that half a grain of chloride of sodium to the ounce of water will destroy the image of an ordinary exposed surface; so that we may argue from that that a mere fraction of that strength will destroy the weakly-acted-on portions of an instantaneous exposure. No doubt distilled water could be resorted to after every addition of the protosulphate of iron, but that is not always at hand, and complicates the process.

In showing specimens of instantaneity the question has been often put to me—"How do you ascertain what the twentieth part of a second is?" That I think can be simply and satisfactorily answered, viz., by using a spring attached to the disc for cutting off the image, then photographing a moving body the velocity of which is ascertained. For example, let me adduce the Loch Long steamer. Her length is 150 feet, her speed in the deep sea nearly fifteen miles per hour—that is, equal to twenty-two feet for every second of time; in other words, she moves through a space fully equal to one-seventh of her entire length in one second. It necessarily follows that if her hull be photographed at full speed at a right angle to the axis of the lens, and the result divided into seven equal parts, if the time of exposure has been one second one-seventh of the entire length will be blurred, for the fifth of a second one-fifth of that division, and so on; so that by using a finely-divided scale, and, if necessary, a magnifying power, you can arrive at a pretty exact estimate of the time of exposure with that particular spring. Its action may be pronounced constant. Of course if any addition be added to the power of the spring it must be ascertained, as in the first instance, against a moving body the velocity and length of which is known.

I am also often asked—"What arrangement is considered best for rapid exposure?" That is not quite so easily answered; indeed it depends entirely on the subject to be photographed. For an extensive plain, on the foreground of which no very tall objects rise, the opening in front of the lens so as to expose the nearest objects first, the sky last and shortest, I have found in my own experience to give the best result; but should any tall object, such as a tree or spire, rising above the horizon intervene, you can easily perceive the higher portions will run the risk of being underexposed. My own arrangements are so constructed, by turning on an axis, that I can cut off the image horizontally or vertically. But one thing I would strongly urge, viz., that the shutter, disc, or whatever it may be, should be as small as possible—that is, as near to the size of the stop to be used as is consistent with safety. On a stormy day, with one shutter (as in the stereo. arrangement) to cover both lenses, the atmospheric resistance is much too great for extremely rapid action, and causes great risk on shaking the camera: the less friction of every kind in such mechanism the better. There should also be a check to keep it from opening the smallest portion beyond what is absolutely necessary.

I may mention that the collodion I used in obtaining the whole of the results submitted for your inspection this evening was kindly furnished to me by one of our members, Mr. John Stuart, photographer, Buchanan Street, who is at all times willing to aid a brother in distress. The paper of the positives before you I obtained from Mr. John Spencer, St. Enoch's Square, and is decidedly the best in every respect I have yet used; indeed, after the paper troubles I have come through lately, it is quite a treat to work with it—easily toned, and yields very little to the hypo. in fixing. Any points I may have omitted, or not clearly expressed, I shall be most happy to answer.

N.B.—Time of exposure of glass positives of landscapes $\frac{1}{50}$th part of a second; of portraits $\frac{1}{10}$th part of a second.

RECOVERY OF WASTE SILVER.

By Charles Corey.

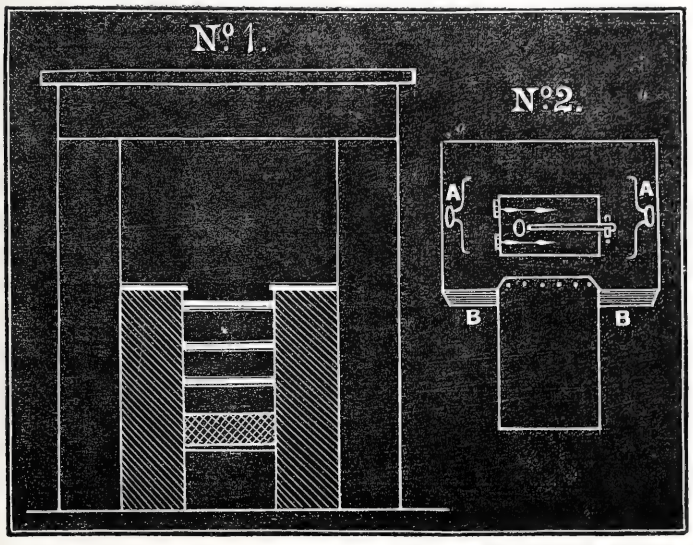
If one may judge from the number of queries that have resulted since, it would appear that my directions contained in a former paper on this subject were not so clear and compendious as I intended them to be. Commonplace as the plan may appear to those who are accustomed to pore over the furnace in search of the hidden riches of the crucible, it is possible that it may need more explanation to the uninitiated, and by means of a diagram I propose to put the practice within reach of every painstaking photographer and the name of this class, I take it, must be "legion." It would be as well, too, to avail myself of this opportunity of correcting my too sweeping *dictum* that most of the precipitates of silver are in the form of chloride. When thrown down by the addition of common salt (chloride of sodium), there is no question they are then chlorides; but Mr. Dawson's able vindication of his opinion as to the existing state of nitrate of silver in the presence of acetate of soda, proves incidentally that where the alkaline mode of toning is used there are also carbonates; and as the oxide of silver is soluble in sulphuric acid, though the bright metal is not, so from accidental causes there may be sulphates, &c. Be this as it may, when the salt is added, the whole of the compounds of silver contained in the jar are primarily converted into chloride, to undergo a gradual change by the influence of the zinc.

I have to thank the Editor for the explanation to one of his correspondents that this influence is progressive, not immediate; although the affinity for the silver is so great that the hydrochloric acid of the salt seizes hold of it at once, liberating the soda in so doing, yet, by long immersion, it is made to give up the silver in part, and affix itself to the zinc—as is exemplified by the corrosion of the surface of the zinc after a time.

Neither, as the correspondent who signs himself "Dullard" supposes, is there anything peculiarly cabalistic in the four times of washing and precipitating, as directed in my former paper. My meaning was this: when the jar was full with the ordinary washing with hard water (which I advised the use of because its turbidity indicated how long any trace of silver unacted on by light remained in the paper, though I omitted to direct the final washing to be with rain or distilled water, to remove any adherent insoluble silver), the jar so filled with the salt added for its conversion should be baled out, and left to be refilled again and again; and where the printing, as in my own case, was frequent, I supposed that this baling and refilling might justify reducing the precipitate after about four times. But it might so happen, if the solutions were not sufficiently rich, it would not be wise to proceed to convert it into metallic silver till the jar had been filled and partly emptied ten or twelve times. A syphon, to

those who are expert in its use, is better for drawing off the supernatant fluid; but, if not cleverly managed, a bubble of air gets drawn up. This breaks the exhaustion in the tube, and the liquid falls back, disturbing the sediment. On the other hand, if dipped too deep, part of the sediment gets drawn up also, and is wasted. For this reason baling, in inexperienced hands, is the best mode.

As all may not be able to procure the use of a dentist's furnace, the annexed diagrams will show every reader how, for the cost of three or four shillings, he may make a very effective furnace for himself; and as there may also be dentists among the photographers, let them treasure the hint, as board filings may be reduced in the same way; for fully two ounces of gold or silver may be melted and refined in an ordinary stove by this contrivance if the flue be long enough for a good draught—that is to say, a room having one or two stories above it to augment the draught.



No. 1 represents a household fireplace. No. 2 is a blower, or plate of sheet iron, of medium thickness, which must be made exactly the size of the vacant space above the bars, whilst the lower portion of the blower closes in the front of the bars also. B B represents the lower edge on either side, turned up horizontally and inwards, so as to rest upon each hob and keep it in its place, whilst a thin wedge, inserted upon its upper side, under the front of the mantelpiece, keeps it from falling inwards or the reverse. Should the bars project instead of being flat, as most probably would be the case, the lower portion must be made in a separate piece, rounded so as to fit the bars close up to each side, and this lower piece be then securely fastened to the upper, so that no air can go up the flue except what passes in at the bottom of the grate, and therefore through the body of the fire. A A are two handles of iron rod, about three-eighths of an inch thick, riveted on, to lift it into or out of its place. In the centre is a hinged door, with a latch, either to feed the fire, watch the progress of the work, or lift out the pot when the contents are fused sufficiently without disturbing the arrangement of the furnace, which the common grate has now become; for if the fire has been lighted with coal first, suffered to burn clear, and then packed up with broken pieces of coke from the gas works—which is cheaper and more easily procured than hard or railway coke, though not capable of producing so great an amount of heat—the extempore furnace will be found equal to everything required of it, for it will roar tremendously.

I have advised the purchase of two pots; for though under usual circumstances one is sufficient, as it may be taken in and out of the fire several times to be emptied and recharged—so long as it be not kept out of the fire long enough to get too quickly cooled—yet occasionally, with the utmost care, a pot will have a large crack in it, through which the melted metal will escape. For this reason it is incumbent on the operator to examine the pot each time of refilling, and if any trace of cracking be detected, at once to reject that pot and fall back on his reserve.

And be it remembered that when the pot is charged with the mixture of pearl ash and waste silver, it is not merely necessary to melt the contents into a liquiform state only. The heat must be kept up until the whole becomes a very bright red: the pearl ash will then appear to boil; and it is not until this ebullition has continued some time that the silver will become liberated and fall to the bottom of the pot. This may be judged to have taken place when, after boiling up and threatening to go over the pot many times, the pearl ash will be observed, by occasionally opening the door of the blower, to have quietly settled down to the lower part of the crucible, only gently simmering at its edges. Now it may be taken out by lifting the pot out by means of a long pair of tongs, and pouring off into a heated iron shovel; but on no account, for the reason before given, must it be poured into water. Besides the danger of this proceeding, when it has become cold, in the form of a black cake, careful examination will show that numberless small particles still remain in the flux, so that it will require to be melted again and again. Every portion of the flux must therefore go through the process of fusion over and over again, until every trace of the bright globules of silver is removed. After this, as it rapidly attracts moisture from the atmosphere, and becomes very disagreeable, it may be thrown away altogether, or into the slop jar to help precipitation in a fresh lot of waste washings.

STEREOGRAPHS.

Instantaneous Views of London.

Photographed by VALENTINE BLANCHARD.

London: C. E. ELLIOTT, 5, Aldermanbury Postern.

IT is generally acknowledged that "the proof of the pudding is in the eating." We have lately seen called in question by a correspondent, Mr. Augustus Webb, resident in India, the correctness of principle involved in the use of bromides in the collodion as accelerative agents, especially adverting to Mr. Blanchard's experiments on the subject as unsatisfactory on account of the commingling of salts with different bases. Now, although there is reason in the objection so far as regards generalising from too limited a number of strictly comparable conditions, we apprehend that were our Indian friend to have an opportunity of inspecting the specimens now before us, he would acknowledge the practical efficiency of Mr. Blanchard's operations, whatever he might think of his theoretical notions.

The following quotation from Cowper appended to the slides of this series is very apt—

> "'Tis pleasant, through the loopholes of retreat,
> To peep at such a world; to see the stir
> Of the great Babel, and not feel the crowd"—

especially as applied to the first slide which we take up, viz.,—

No. 191, THE NEW CATTLE MARKET, HOLLOWAY, in which are seen butchers and salesmen in considerable numbers, bargaining and handling the sheep, many of which are packed in the various pens. A cart with the tail-board hanging down ready for the load is in the foreground, and between the shafts stands a patient-looking white horse, with more bone than muscle, in an attitude that military men style "at ease." The background is occupied by the square central clock-tower, the base of which is surrounded by the several counting-houses and banking establishments peculiar to the locality. One marked character of the scene must not be omitted,—the adornment (!) of the iron struts of the lamp-posts with the coats of the drovers.

From meat to vegetables is a natural transition, so that COVENT GARDEN MARKET (No. 183) follows in appropriate order. This is a well-executed representation of a familiar scene. Near the west front of the building may be seen a life-like group of market people surrounding a stall on the right, waggons filled with the well-known round baskets containing fruit and choice vegetables, horses with bags on noses taking their early feed, boys "loafing" about or on the look-out for a job.

THE FLORAL HALL, COVENT GARDEN (No. 184), is not quite so satisfactory a picture: the great contrast between the strong sunlight and consequent deep shade has been heightened, and the effect impaired by rather too much intensification of the high lights.

From Covent Garden to CHARING CROSS is but a step. There are two slides in which the statue of Charles I. is included,—No. 177 being a view of THE STRAND looking easterly, and showing the corner, by Northumberland House, where the omnibuses pause to take up passengers, two of which were performing that operation during the exposure of the plate; and there are several persons in the act of climbing up, or just preparing to do so. There is a trifle of over-development in this specimen, and a little distortion of the architecture from turning up the camera. No. 180 is taken from the same spot as the preceding, but looking more to the left-hand, and taking in St. Martin's Church. No. 179 is another view of ST. MARTIN'S CHURCH and a portion of Trafalgar Square, one

policeman and several boys evidently watching the operations of the photographer.

The National Gallery, from Pall Mall (No. 176), also includes a front view of St. Martin's Church. This is a capital slide. Numerous foot-passengers and some vehicles are well scattered about, including many going up and coming down the steps of the National Gallery; two fruit hawkers, with their barrows, are standing close beside the kerb-stone; and three or four long ladders are leaning against the house on the left, next adjoining to that in which the annual exhibitions of the London Photographic Society are usually held.

Of Waterloo Place, Regent Street (No. 175), Great George Street (No. 174), and St. Margaret's Church, Westminster (No. 172)—the two last including the clock-tower of the Houses of Parliament — we have nothing special to remark. Victoria Street (No. 171) is interesting, from its including a view of Westminster Abbey, and the moving figures in this slide are capitally caught.

The Church of St. Mary le Strand (No. 186) is taken from a spot not far from Somerset House, which is just visible on the right hand; and the busy traffic of that locality is well represented, though the shadows are somewhat too dark.

Temple Bar (No. 187) is truly excellent—a stream of cabs, omnibuses, and carts pouring through the narrow gorge, the very numbers on some of the vehicles being distinguishable, and the two statues against the upper part of the ancient gateway clearly defined. The tower of St. Dunstan's Church is seen over the gateway, and nearly in a line with it an impertinent little chimney-pot is doing its best to help towards the smoke-begriming process to which all our London edifices are necessarily subjected.

The General Post-office, St. Martin's Le Grand (No. 194), is not quite so happy in execution; but Holborn Hill (No. 195), though a little too dark, is characteristic of that busy thoroughfare.

New Oxford Street, looking east (No. 196), is, however, first-rate in execution. Omnibuses, carts, cabs, waggons, and foot-passengers in shoals, in active movement, are all "arrested." One "Hansom" cab alone, in the right-hand corner, is blurred in outline, and this seems to have come suddenly round the corner into the view. In the immediate foreground is a man, without his coat, wheeling a barrow, his left leg poised in mid-air, in the act of stepping; just in front of him is an omnibus, on the back panel of which is observable the placard, "All the way, 3d.;" and on the outside front seat, to the right, is a gentleman wearing a white hat, with a black hat-band; while on the other side of the driver a passenger is evidently turning to address him. One individual in a black suit, with his hands in his pockets, and looking on excellent terms with himself, is sauntering towards the spectator. The whole scene is full of life, and the photography leaves nothing to be desired.

We have one view of that very ugly edifice, The International Exhibition, the east front, taken from the Cromwell Road (No. 185). A number of visitors, male and female, are crossing over from the corner by the South Kensington Museum, and several policemen are standing in attitudes peculiar to the species—that is to say, very wide awake, and on the look out. There is a little too much contrast between light and shade in this slide.

Three river scenes deserve some notice:—The Port of London, evening (No. 146), a scene on the Thames, just below the bridge. Some heavy clouds, with light-illumined edges, contrast well with the glare from the uneven surface of the water, reflecting the indirect light of the setting sun.

The Seamen's Floating Hospital, off Greenwich (No. 147), presents some picturesque cloud and water effects, but is rather out of focus.

Study on the Thames (No. 197) is an admirable photograph, and represents the south side of the river bank between Southwark and London bridges—time high water, when lighters innumerable and other craft are moored close alongside the various wharves, ready to be unladed in due course. St. Saviour's Church is seen above the buildings on the right hand; and on the left a sailing barge has just made a tack. From the foot of the Surrey side of London Bridge the small passenger steamer has just started on her voyage, and across the bridge a perfect forest of masts is observable, with a puff or two of black smoke showing the whereabouts of certain steamboats.

We can cordially commend these capital illustrations of the metropolis to all desirous of possessing records of out-door life in the modern Babylon.

Exhibition Gossip.

Although it is the beginning of the now rapidly approaching end of the Great Exhibition of 1862, still the crowds of procrastinating visitors which, according to the daily oracles, were to have besieged its entrances from "early morn to dewy eve" during the last few weeks, are all invisible. Truth to speak the attendance grows more and more thin, and, despite the thoroughness of the "penny-wise-and-pound-foolish" policy which has characterised its management, the Guarantors have no very hopeful prospect before them in the winding-up of its accounts.

It has been duly announced that the prizes will be awarded by His Royal Highness the Prince of Wales in person, early in the year 1863. This is good news.

The picture galleries will be closed a fortnight before the rest of the building, and those who consider the increasing damage sustained through the damp by many of these valuable works will not think this a day too soon.

Our present business here, however, is with the photographic reproductions. As an educational branch of photography that of reproduction cannot be too highly estimated. The reproduction and distribution of the masterpieces of ancient art, *facsimiles* of unique old documents and books of rare value, the preservation of costly engravings, and the copying of choice paintings, are tasks which have such power and value as we can only grasp through the medium of much thinking. It was not without good reason that one of our best men called it "the highest branch of the art."

For many of the reproductions of greatest value we are indebted to Col. Sir Henry James, whose *facsimiles* of Domesday Book and the earliest edition of Shakespeare must create no little interest in all who inspect them. The very names of such works awaken historic curiosity. The copies from Turner, by Thurston Thompson, are remarkably fine works. The living air and light which floods the canvas of this great master are—despite the absence of colour and the tender imperceptible gradations upon which in the originals they hang so tremblingly existent—thoroughly well rendered. Still, the soaring ambition which — perhaps unwisely—scorned the forms of earth to revel in the spiritual beauties of the sun and air, naturally found so much of its power in the marvels of colour, that, when its productions appear divested of this, their greatest charm must necessarily be wanting, and their defects as necessarily prominent. Still, every artist and every artist-photographer ought to possess a set of proofs from Mr. Thompson's negatives, as studies of the very highest pictorial character. The truths of form are readily recognised by photographers generally; but, in common with most other folk, few photographers recognise those spiritual truths of light and atmosphere which, in all their wondrous diversity of marvellous effects, form the chief aims of Turner's grandest pictures. For the study of such effects no better aid can be sought than such as is to be found in reproductions from the works of Turner. The copies from the Cartoons at Hampton Court, by Caldesi and T. Thompson, are too well known and too widely appreciated to need from me either praise or description. The young painter-student who has nature and such copies of great masters as these to study from has little need to travel in search of other schools, although it may perhaps be difficult to force conviction of the fact, travelling is so pleasant. Dolamore and Bullock exhibit some very good reproductions, among which is that curious combination of striking faults and beauties, *The Blind Beggar*, of the National Gallery. Some fine copies of paintings and statuary have been contributed by Mr. J. B. Pyne and by Messrs. Cundall and Downes. Some excellent reproductions of engravings are from the Amateur Photographic Association, and some very superior ones have been sent by Mr. Ramage. Mr. Ponting exhibits several capital copies of paintings, and M. Victor Prout has some very artistically reproduced works, as has also Mr. Stephen Thompson.

In the French department the reproductions take high rank, and we recognise very many copies from famous pictures now in the neighbouring French picture gallery. Copies of plans, drawings, paintings, engravings, and statuary are here to be found, all of which are very excellent. It will be observed that the national character peeps out in the selections made for copying. The pictured incidents are all more or less of the dramatic or stirring kind. One of these copies, representing the beautiful Phryne before her judges, disrobed by the orator who defended her cause in order that the beauty of her person might plead in her behalf, is a remarkably good copy of a subject treated in a spirit peculiarly French. A nude female figure bearing a vase, from a pic-

ture in the French collection, is also a very fine copy. But I have not sufficient space or time to describe these more fully. In proportion to the number of pictures displayed upon the wall and screens, reproductions are far more numerous here than in the English department.

The reproductions of T. Albert, of Munich, in the Bavarian Department, have been so frequently described that we need not pause to express further admiration of their perfections.—Some fine copies from Belgium are by J. Mascré, and the Netherlands send us contributions by Dr. Eyck.—Von Minutoli is a valuable contributor from Prussia, and Leth and Lemann are equally valuable contributors in the Austrian Department.—But Rome comes foremost in specimens of interest, size, and value. The art-treasures of the Farnese Palace may be said indeed to belong to the world when thus reproduced.

And now I must terminate these "gossipping papers" by a brief glance at this glorious speculation as compared with that of 1851.

In the first place we cannot help regarding the peculiarities of management seen in 1851 and in 1862. Cautiously, if not doubtfully or fearfully, the Commissioners of 1851 began their labours. *Hoping for no profit, their only care was to avoid a loss*, and the result was that they reaped a very decided pecuniary success. It must be remembered, too, that the funds at their disposal were insufficient—the public were not sanguine of success—exhibitors came forward reluctantly—and a strong tide of prejudice and opposition met them from nearly all quarters.

Boldly and hopefully and with all that could make success a seeming certainty, the Commissioners of 1862 entered the field. The full tide of popularity bore them up, and exhibitors flocked in for every department. *Hoping for great gains, their only care seems to have been to swell the profits of the undertaking*, and the result, it seems, must be a pecuniary loss to the Guarantors.

In 1851 prudence and caution, arising from no hopes of power of patronage, &c., be it remembered, achieved success. In 1862 greedy eagerness and that desperation which clutches even at straws, associated with the certainty of present and the hopes of future power of patronage, &c., have led to what must ultimately prove, more or less, a failure. Is not there a moral for the Commissioners somewhere hereabouts? A. H. W.

SOME PHOTOGRAPHIC "WHIMSEYS."*

By J. C. Leake, Jun.

When I undertook to provide a paper for this evening I had no doubt that I should be able to persuade some of our friends to come forward and place at your disposal a paper on some subject of a far more novel and interesting character than I can hope to produce. In the absence, however, of anything else—and rather than the meeting should go empty away—I will endeavour to make a few remarks, in the hope of raising a discussion which may elicit some useful information from those gentlemen present who are so well qualified to give it.

It has been said of photographers, and truly, that they are in most cases ignorant of the theories of their art. That this is so is a fact much to be regretted. Yet, let a man be ever so good a theorist, he will in all probability get into the habit of doing a number of odd things from fancy; and, if asked why he did so and so, his reply would be, "I fancy it is better, but can give no reason for thinking so."

This being my unfortunate condition, I propose stringing together a few of my photographic whimseys, and recounting them to you if you will kindly listen for a quarter of an hour.

Beginning with plates.—I have a prejudice against everything but the best polished plate glass. I have tried sheet and crown of almost every description, and in all cases have failed to produce satisfactory results. In fact, I believe it to be impossible to produce as much fine and delicate detail upon either of the two last-named varieties as upon the former. If, after development, a picture upon a piece of sheet glass be examined, it will be found that a film of reduced silver is deposited between the collodion and the glass. This being the case, it is evident that some reducing action is set up; and that this is independent of the development may be proved by taking a piece of sheet glass, exciting as usual, and, after allowing it to remain in that condition a few minutes, fixing it, *without development*. In almost every case in which I have tried this experiment a film of reduced silver has completely covered the plate. Glass of this description is therefore unfit for photographic purposes, and pre-eminently so for dry plates, which have to be kept a long time in a sensitive condition. I know many amateurs use sheet glass from motives of economy, and often fail through so doing; and I would certainly advise them to throw away all such plates, and betake themselves to patent plate, which will serve them better.

Another subject upon which I entertain views which may be regarded as peculiar, is the preparation of the nitrate bath for negatives. I cannot make a bath work to my satisfaction without the addition of carbonate of soda. I have tried fused nitrate of silver, oxide of silver, and most of the other substances which have from time to time been recommended for making and mending baths, but in my hands none have been so successful as the addition of a small quantity of the carbonate. In making a new bath I proceed as follows:—Having dissolved the nitrate of silver in the water I add to each ounce of solution about a couple of grains of carbonate of soda, and a small quantity of the iodising solution with which the collodion to be used is iodised. Let the solution stand a few hours, filter, and it will be ready for use. Negatives taken in a bath prepared in this manner are of a rich creamy tint, very full and deep in colour, and, what is of the greatest importance to the portraitist, the half-tints and shadows of flesh are rendered with great perfectness. In a conversation with Mr. Blanchard, whose street views are now so well known, he informed me that his own experiments in this direction had led him to the conclusion that this method of preparing a bath was by far the best, giving a better quality of negative and producing it in a shorter time than when the ordinary modes were used.

In connexion with sensitising I have another whimsey, viz., that, as a rule, plates are removed from the bath before the sensitising process is completed. The time usually allowed—two or three minutes—is scarcely sufficient. I would prefer to allow five or seven. On immersion in the bath, the plate becomes coated with iodide, first, in lines corresponding in direction with that of the dip. If the plate be taken out of the bath before these lines are removed, and an even coating obtained, the picture will be streaked, as the lines will appear in the finished negative. It is often said that the plate, if left too long in the bath, will become streaky; and this will certainly be the case if it be removed from the bath too soon.

I am a believer in long exposures. In my humble opinion a large proportion of the *cartes de visite* offered for sale in our shop-windows are very considerably under-exposed. I know it is desirable to make the exposure as short as possible for many reasons; but nothing can justify the principle of so shortening the exposure as to make the resulting negative hard, with sooty shadows and crude, chalky lights.

The best results will be obtained by giving a lengthy exposure and a somewhat short development. If the development has to be pushed, the result is rarely satisfactory. It is far better to let the light act so long upon the plate as that you have some energy to spare, and so can stop the development rather short.

I consider a picture under-exposed unless the whole of the detail in the flesh and hair is distinctly and well rendered. Let the shadows of the flesh be well given, above all things: it is to this I look alone in portraiture. Dress and all must (if necessary) be sacrificed to this; as no beauty of detail or brilliance of effect can compensate for a want of gradation in the flesh tints.

Another fancy of mine is with respect to the iron developing solution. This I prefer to mix at least twenty-four hours before use. In the first place this is better because it will allow the sediment to deposit itself, and so save filtering; and secondly, and what is of more importance, the negatives will be finer in texture, and consequently softer. As far as I can ascertain, the particles of silver constituting the image are much smaller than when the solution is freshly mixed.

As to intensifying, after all I prefer the old system of "pyro." and silver, and of finishing the negative at once. If the exposure be correctly timed, and the bath, collodion, and developing solutions in order, but very little will need to be done to obtain sufficient intensity, and what *is* wanted will most readily be obtained by this method. It has been argued that this method of intensifying is apt to clog up the fine lines and destroy the sharpness of the negative. Perhaps if carried too far it does, but carefully done (as everything in photography should be), it will give very fine results, and I believe it to be, on the whole, the best method of intensifying.

For fixing I always use hyposulphite of soda. In the first place because it is easier to use. I keep a dipping bath full of solution at the end of the developing table, and after the plate is intensified just pop the plate in, and leave it until the iodide is dissolved. A few minutes in excess will not hurt it. Secondly, it is cheaper, not costing a quarter as much as cyanide of potassium. And thirdly, and most important of all, it does not affect the health of the operator. If, however, cyanide *be* used, it is better to use it strong enough to fix the picture quickly; for if a weak solution be used, and the action be continued for a long period, the peculiar bleaching action will render the image grey, and the light will, in printing, permeate every part, and the resulting print will be flat and wanting in brilliance.

So much for negatives.—Now, if you are not tired, for a few whims about printing. And, first, as to paper. When the disease known as "cardomania" set in, photographers were of course driven to use a paper upon which as much detail and brilliancy as possible could be obtained, and the variety known as Rive was at once acknowledged as the best, on account of its superior hardness and fineness of texture. For small pictures it is, undoubtedly, the best; but I hope the day is not far distant when, for everything above whole-plate pictures, a paper will be used which has not the offensive gloss of albumen. Until, however, we can prepare a paper, producing the same amount of depth and brilliance as albumen, we must perforce use it. Nevertheless, the gloss *is* a nuisance; and I recommend the subject—the production of a paper giving the depth of albumen without its gloss—to the attention of those gentlemen present

* Read at a meeting of the South London Photographic Society, October 9th, 1862.

who have time and inclination to experiment in that direction, and also to the Experimental Committee.

Starting with Rive paper, then, I will proceed to state what I consider the best method of producing prints upon it, always bearing in mind that I am considering printing portraits only. In sensitising, do not be afraid of the silver. To produce the best results, from seventy to ninety grains to the ounce may be safely used. I have a fancy for using a bath of, say one hundred grains; and, instead of floating three or five minutes, floating only two. And I believe this to produce the best results, the print being more on the surface of the paper.

As soon as the paper is surface-dry it should be thoroughly dried by artificial heat, and the solution should *not* be allowed to soak into the paper. I think it will be found that most portrait negatives, good ones especially, will print best in the shade. The action is slower and more regular, and generally more satisfactory results will be obtained than by direct sun-printing,—Mr. Thomas to the contrary, notwithstanding.

All having gone on satisfactorily to this point, I am inclined to think that here many printers commence the work of spoiling what they have hitherto done. Instead of quick and careful washing to remove the nitrate of silver, the prints are pitched into a pan, and left to soak for, perhaps, half-an-hour or more, during the whole of which time the nitrate of silver is soaking into the pores of the paper, and laying the foundation of future mealiness and uneven toning. I believe it to be of the utmost importance to remove the whole of the nitrate of silver from the surface of the proofs, and that the more rapidly this is effected the better. Quick and careful washing for ten minutes will do more good than soaking the prints for half-an-hour. After a thorough washing in the manner mentioned, the prints may be considered ready for toning without any further treatment with acetate of soda or chloride of sodium, which I am inclined to consider as unnecessary complications.

Nearly twelve months since I wrote a short paper on printing and toning, in which I stated my preference for the acetate-of-soda toning-bath. During the last year I have conducted a somewhat lengthy series of experiments on the various substances used for toning; but I have not found cause to alter my opinion, and still believe the old formula of thirty grains of acetate of soda to each grain of gold to be the best. One thing is imperative: the bath must be mixed at least twenty-four hours before use. A useful "dodge," however, if a bath be wanted to work at once, is to double or even treble the amount of acetate. If this be done a bath may be used as soon as mixed, and the action will be more rapid than if the bath has been kept. On the whole, however, I would not recommend this process, as, if great care be not taken, the prints will redden to a fearful extent in the hyposulphite, and the whole process has more of uncertainty in it than when the first-named bath has been used. As soon as the toning is completed the prints should be well and quickly washed before fixing. Many persons do not think this important. I do. I have seen proofs taken from the toning-bath, and placed on a plate of glass to drain till some thirty or forty have accumulated, when the whole batch was placed in the hypo. in a mass, and separated in the solution. I think nothing can be more dangerous than this method of procedure, and would recommend that the proofs be *well* washed before fixing and placed in the hyposulphite solution singly.

The usual strength, six ounces to the pint, will be found strong enough for this solution; and I would recommend that it be used fresh *every day*, and unmixed with either chloride of gold or nitrate of silver, as has been recommended.

On removal from the fixing bath each proof should be washed, back and front, on a glass plate under a tap, before being placed in the larger dishes to soak.

I have to apologise for having nothing more novel to offer you; but I hope I have said something from which many of you will disagree *in toto*. This being the case my end will be attained, and we shall have a long and interesting discussion upon the points you may think proper to dispute.

Dagron's Microphotographs.—The Abbé Moigno gives a most enthusiastic account of the new method of preparing and exhibiting microphotographs invented by M. Dagron. After describing a process by which a series of the minute sun pictures are taken in rapid succession, he proceeds to inform us that a number of "cylinders of common or flint glass are prepared in advance, about five or six millimetres long, and two thick. The second extremity of these cylinders is spherically rounded in a hollow, to transform it into a magnifying lens. To one extremity of the cylinder a micro-photograph is fixed with Canada balsam, and the edges ground by an optical tool to efface the marks of the union. This is the photo-micrographic cylinder, one of the most delightful conquests of science and art. . . . If we look at the plane end of the cylinder we see the picture with great difficulty as a black, almost imperceptible, point, and M. Dagron was naturally led to do for the second extremity what he had done for the first. He fastened on a second picture with Canada balsam, he rounded the glass in another hollow, and he obtained a cylinder which twice performed the functions of microscope and object holder." In other cases he fixes the picture so that it can only be seen when the glass is held at a particular angle. As the originality of these methods was disputed, and their merit referred to Sir D. Brewster, who gave some similar hints, the Abbé Moigno obtained a letter from that philosopher vindicating M. Dagron's claims to the invention.—*Intellectual Observer.*

British Association.

CAMBRIDGE MEETING, 1862.

The thirty-second meeting of the British Association for the Advancement of Science was this year held at Cambridge, commencing on Wednesday, October 1st, and ending on the 8th, the President of the year being Professor Willis, F.R.S. This was the third visit of the British Association to the *alma mater* of many of its originators and leading members; and a noticeable fact connected with the meeting was the large muster of members who had graduated at the University of Cambridge,—among whom we were glad to meet Mr. F. Maxwell Lyte (of Christ's College), so long and so honourably connected with our art-science, who has by his charming productions in landscape photography done much to establish the claim of photography to rank among the fine arts. M. Claudet, too, was present; as was also Mr. J. W. Osborne, of Melbourne, the inventor of the photo-lithographic process, which has been found so valuable and useful in the reproduction of maps and plans in the colony of Victoria. Mr. Osborne took a very active part in the proceedings of several of the sections.

The number of papers connected with photography read at the Cambridge meeting were, as usual, very few; yet never before were the productions of the camera brought more into requisition at the British Association than on this occasion. Photography, as an illustrator of nearly every conceivable subject, "cropped out" in every section, and its exceeding value in this direction was manifested at the late meeting. Even the stereoscope was brought into requisition on more occasions than one, to assist the members in comprehending the photographic illustrations, in the shape of stereoscopic pictures, introduced by the authors of papers.

The weather was generally very fine, and those members who were strangers to Cambridge thoroughly enjoyed their visit to the old university town, and were to be found sauntering through the "courts" and cloisters of the various colleges, examining the structural beauties of the university buildings, chapels, bridges, ancient gateways, &c., &c., or wandering along the margin of the "lazy Cam," and through the avenues of ancestral trees, which are the glory of the "College Walks." Many a lovely view for the camera meets the eye in every direction, and truth to say, Mr. Mayland, a very able local photographer, has taken advantage of his position in this picturesque locality, and has reproduced a large number of the most notable views in and around Cambridge. Still there are numerous charming views and quiet "bits" which have as yet escaped the photographer's camera.

The Corporation and the University authorities threw open their various buildings for the use of the Association, and the heads of the principal colleges entertained most hospitably the leading members. It is long since the "butteries" were in such a state of pleasant excitement. The rich banquets prepared for "potent, grave, and reverend seigniors" revealed the material wealth of the colleges, and the generous sympathy of college "dons" with hungry philosophers and their own intimate acquaintance with the mysteries of gastronomic science.

It was a matter of regret that the General Secretary, William Hopkins, Esq., F.R.S., of St. Peter's College, was prevented by indisposition from taking an active part in the duties of his important office.

The President, as is customary, delivered his address on the evening of the opening day (Wednesday, October 1st); but the only allusion to photography in that document was as to the operations of the Kew Committee.— On Thursday evening a *soirée* took place at the new Assembly Rooms attached to the Guildhall, at which there was a crowded and brilliant attendance of "men of mark" and "ladyes fayre"—crinoline and university gowns asserting undisputed sway in the rather contracted area in which the company were presumed to promenade. Mr. Dallmeyer exhibited some excellent microscopic and other instruments.—On Friday evening Professor Tyndall delivered an admirable lecture *On the Forms and Actions of Water*, illustrated by some very beautiful experiments.—On Monday evening Dr. Odling delivered a discourse *On Organic Chemistry*.—On Tuesday evening there was another *soirée;* and, as several of the members had by this time taken their departure from the town, while some were otherwise engaged, there was a freer circulation of the visitors through the hall, and space afforded for examining the splendid collection of binocular microscopes and microscopic objects displayed by Mr. T. Ross, Messrs. Smith, Beck and Beck, and Messrs. Powell and Lealand. Dr. Salviati, of Venice, exhibited specimens of mosaic; and Mr. Wright, of London, showed a very fine selection of minerals, fossils, shells, and a meteorite, of the extraordinary weight of nine and a-half pounds, which fell on the 1st May, 1860, at New Concord, in the United States. Among the objects of art laid on the tables for inspection was a magnificent copy of the first part of the folio work which is being published by Mr. A. W. Bennett, entitled *Our Satellite: a Selenography*, by

Dr. A. Le Vengeur d'Orsan. This photographic delineation of the moon is deserving of all success. In a room in the basement, Mr. G. Miller Guy exhibited a large electro-motive machine, to which he had previously drawn attention in a paper in Section A. In a room adjoining the principal hall, M. Claudet had his solar camera apparatus for enlarging *carte-de-visite* pictures to life-size, and this operation proved a source of interest and amusement to a large number of ladies and gentlemen attracted thither from the neighbouring hall. By the aid of the oxy-hydrogen light, enlarged images were thrown upon a screen. Among the pictures thus shown were some very fine photographs of animals at the Zoological Gardens, taken by the Compte de Montizon; also some of Messrs. Negretti and Zambra's views in Java, &c., &c.

The concluding meeting of the Association was held on Wednesday, the 8th instant, at three o'clock. After the usual votes of thanks to the authorities and various public bodies of the University and town of Cambridge, for their hospitable reception of the body, and for the use of the Guildhall, Senate House, Schools, and Halls, in which to hold the various meetings, *soirées*, and sectional meetings—in fact, when, as is the custom at this concluding meeting, everybody had lavished praise on every other body—the British Association for the Advancement of Science was adjourned till August next, when it is to meet at Newcastle on-Tyne, under the Presidency of Sir William Armstrong,—till which time and place we bid the Association a respectful farewell.

We now proceed to give such papers in connexion with photography as were read in Section A. (Mathematical and Physical Science) and Section B. (Chemical Science).

SECTION A.

FRIDAY, OCTOBER 3.

On Autographs of the Sun.

PROFESSOR SELWYN exhibited and described a series of "Autographs of the Sun," taken by Mr. Titterton, of Ely. These pictures are the same as those in the International Exhibition, on the north wall, in the gallery of Philosophical Instruments. He called them autographs, as the term photograph he thought too general. The instrument with which they were taken was a camera attached to a refracting telescope, arranged so as to obtain an instantaneous exposure. The Rev. Professor here produced the autographs taken during a series of very fine days, from the 25th of July to the 4th of August, 1862. These days are remarkable not only as having ripened the harvest, but because the sun then exhibited a number of fine spots. The last day was the most interesting, the great spot being just at the edge of the disc. The same group appeared in the autographs of August 19th to the 25th, reduced, however, to one spot. Sir John Herschel was the first who suggested this application of photography, and it was at his instance the elaborate instrument in use at Kew was constructed, of which the contrivance shown by Professor Selwyn was a simpler adaptation. Some very important phenomena are exhibited in these autographs. The spots on the sun take about twelve and a-half days in their passage across its face, and generally make their appearance at the part answering to the tropical belt of the earth. The dusky edge of the sun, too, is plainly perceived. But as it was suggested that the sides of the camera might produce this difference in light, Sir John Herschel proposed taking a picture in such a manner that the edge of the luminary should appear in the middle of the plate. In the autographs taken in this way the dusky edge is still very apparent, no diminution whatever of the comparative light having taken place. The reason for this dusky edge is from the sun's possessing an atmosphere. By means of these autographs the *faculæ* can be very clearly discerned: these, he suggested, were waves of light, thrown up higher than the general surface, and answering to the cavities which formed the spots. The learned Professor then concluded with a few pertinent remarks upon the more extensive knowledge of the sun which might ultimately be obtained from these very interesting experiments.

The Rev. F. HOWLETT described his observations of the disappearance of the large spot (24,000 miles in diameter) on August 4, by which it appeared that at the times when the two autographs taken that day showed a visible depression in the limb of the sun there was still a streak of light between the spot and the sun's edge—by the first measurement twelve seconds in breadth, by the second four seconds.

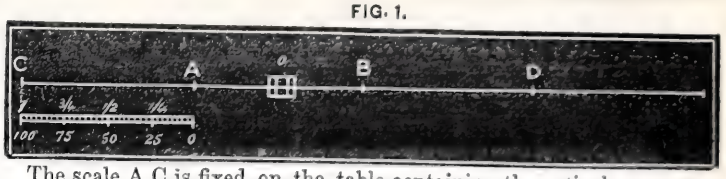
MONDAY, OCTOBER 6.

On the Means of Following the Small Divisions of the Scale Regulating the Distances and Enlargement in the Solar Camera.

By A. CLAUDET, F.R.S.

IN a former paper read before this Association I have proposed a new method for measuring both the distances of the negative and screen by means of a scale of unity divided into 100 parts, and smaller fractions if possible. By this method the distances are measured not from the object-glass, A *fig.* 1, but from two points A and B, which on each side respectively correspond with the focus for parallel rays. No object can be brought nearer the lens than A; and B being the focus for parallel rays, there cannot be any focal distance nearer than B.

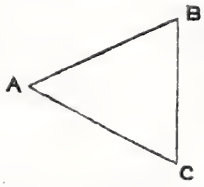
FIG. 1.



The scale A C is fixed on the table containing the optical apparatus, and an index connected with the frame holding the negative being brought exactly on any division of the scale, indicates the proportion and the distance of the image.

The whole arrangement would be very complete and satisfactory if the scale were long enough to be marked with divisions sufficiently conspicuous; but the shorter the focus of the object-glass the smaller the divisions of the scale must be. Even for long-focus object-glasses it is very difficult to subdivide the parts of the scale to a degree which enables us to obtain, with the greatest accuracy, both the exact positions of the negative and screen.

FIG. 2.

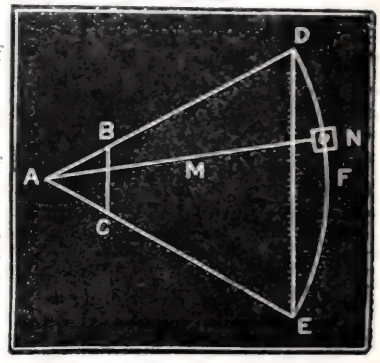


The means I have adopted to reach the divisions with a greater precision and certainty, consists in constructing on the table of the apparatus an equilateral triangle, the base of which is the exact length of the unit of measure. Taking eight inches, for example, as the length of the scale, we have a triangle A B C, *fig.* 2, the three sides of which are eight inches.

We can enlarge the base three, four, five, or any number of times, by extending the sides A B and A C in the same ratio. If we want to enlarge the scale four times, we form the triangle A D E, *fig.* 3, the base of which is four times larger than B C, or equal to thirty-two inches.

If, instead of dividing B C into 100 parts, we make these divisions on the base D E, it is evident that they are four times larger than if they were taken on the base B C.

FIG. 3.

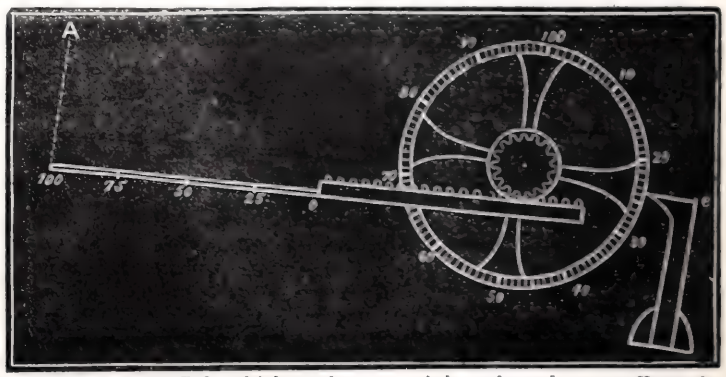


Now, if we take the lines A D, A E, as the radius of a circle, the centre of which is at A, we may describe the arc D E F, the end of which, D E, is the increased scale; and supposing that this radius is a metallic thin wire M, fixed on a piece N, sliding on the arc, it is evident that each division of the magnified scale which happens to be covered by the wire will correspond exactly with an equal division of the scale B C.

But as it would be very difficult to mark distinctly these divisions on the base B C, and, if these divisions could be marked, still more difficult to see and read them, we may dispense with dividing B C, finding a greater advantage by establishing larger proportionate divisions on D E; the only thing to do being to fix on A D and A E the position of the unit B C, according to its length, by taking A B and A C equal to B C. So that after having brought the metallic wire on the division of the scale, D E indicating the size of the required image, and the wire being fixed on the index moving with the frame of the negative, we shall bring the index exactly on any division of the scale B C, however small it may be.

Another plan suggests itself for producing the same result, which would consist in fixing the moveable frame of the negative, A, *fig.* 4, on

FIG. 4.



a rack as long as B C, which, acting on a pinion adapted to a sufficiently large wheel containing the required divisions, could produce a whole revolution of the wheel; and an index, A, being fixed on the table, would indicate on the wheel the exact amount of the course effected by the negative on the scale B C, and, by moving the wheel to the division required, this would bring the negative with the greatest accuracy to the distance corresponding with the division.

This system of focussing all camera lenses might be very advantageously adopted in photographic operations, and would be less subject to errors than the usual way of focussing on the ground glass.

TUESDAY, OCTOBER 7.

Experiments on Photography with Colour.

By the Rev. J. B. READE, F.R.S.

AN able article on photography in the February number of the *North British Review* hints at the possibility of obtaining natural colours by means of photography.

"The sun-painter," says the author, "has yet to arrest the colours of nature, and fix them upon his tablet; and though but a slight approximation to them has been obtained, yet we have no doubt that photography with colour is a possible result of scientific research."

This observation from such a quarter is just so far encouraging that it invites experiments, and I shall be happy to find that my own attempts are a step in the right direction.

A recent examination of the phenomena of polarised light, in their immediate connexion with the undulatory theory, led me to inquire into the causes of natural colours, and thence to the possibility of coloured objects setting up in sensitive films on which their image is thrown the very same causes which regulate and determine their own respective colours. This being effected, the image of an object would communicate to the eye the identical colour of the object itself.

This is what I have aimed at, and I hope, as the illustration will prove, not altogether without success.

Dr. Young's Bakerian lecture in 1801 afforded me valuable aid. The propositions, in general terms, are—that radiant coloured light consists in undulations of the luminiferous ether; that all material bodies have an attraction for the etheral medium, by means of which it is accumulated within their substance, and exerts its influence beyond them; and that the luminous phenomena are exhibited under two modifications—the vibratory or permanent, and the undulatory or transient state.

This theory leads to the conclusion that the undulations within the substance of material bodies communicate their vibrations to the etheral medium without them, and thence to the same medium within the eye. If the undulations be such as to produce red, red is seen by the eye, and so for other colours. Now, as we have films eminently sensitive to the action of reflected light, and capable occasionally of being coloured by such light, it is clearly within the laws of physical science to suppose that the several portions of the excited film may retain within themselves, in the vibratory and permanent state, the varying undulations of the coloured objects whose images they receive. A picture with the colours as in nature would be the result, instead of the mere black and white mezzotint at present obtained. The *desiderata* are a sensitive silver compound capable of receiving and transmitting the undulations and energetic reflections from the objects themselves. A tame reflection in nature as in morals is valueless.

In the course of the present week I happened to obtain unusual traces of colour in photographic portraits. The chief difference in manipulation was a slight excess of the iodiser in the collodion, and the addition of acetic acid and acetate of soda to the bath; and, in order more fully to test the effect of the cadmium and bromo-iodiser, I increased the quantity until the colours ceased to be strengthened.

The final proportion of iodising solutions gave the portrait which illustrates these few remarks. The general warm colours of the forehead and face of the sitter are fairly represented, and the varying tints of the hirsute ornamentation correspond with the original. The tone of the shooting-coat is also correct. I have also obtained coloured pictures of buildings, and a good representation of autumnal tints; but these are within the experience of many photographers. My chief object is to invite experimenters into this interesting field of research; and, therefore, I will not occupy the time of the section with anything more than a simple statement of the principle which has guided me, and the method of practically applying it.

[The picture which accompanied this communication to the section was shown to the members present during the reading of the paper. It had a slight amount of colour upon the face where the light was strongest, produced evidently by the excess of the iodiser; but, in the opinion of the photographers present, the evidences of colour were not of a character to warrant any hope of a solution of this important question.]

SECTION B.

THURSDAY, OCTOBER 2.

Description of a Rapid Dry Collodion Process.

By THOMAS SUTTON, B.A.

THE problem which has most interested photographers of late years has been the discovery of a dry collodion process by which plates can be prepared as sensitive as with wet collodion. In the wet process the negative has to be taken and finished upon or near the spot from which the view is taken, and with wet collodion the tourist is therefore obliged to work in a van or tent, and carry a load of paraphernalia about with him, which is, of course, both expensive and inconvenient. To avoid this he is compelled to work with dry plates, and hitherto no process has been published by which dry plates can be made as sensitive as wet ones. A rapid dry process has therefore been an important subject of investigation to photographers, because during a long exposure of a plate the shadows move, and figures sometimes alter their position. A man or horse, for instance, are likely to remain still for a few seconds, but not for ten minutes.

I have lately solved this problem of rapid dry collodion, and produced dry plates as sensitive as wet ones, which will moreover preserve their sensitiveness and good qualities for several weeks, and perhaps indefinitely. This process, and the principles upon which it is based, I will now briefly describe.

The rapidity of this dry process depends upon the accelerating effect of bromine in dry collodion, and in this respect an analogy exists between the Daguerreotype and dry collodion processes. In the former a silver plate simply iodised is extremely insensitive, but when submitted to the fumes of bromine its sensitiveness is increased a hundred-fold. The same thing happens in those collodion processes, wet or dry, in which the free nitrate of silver is washed out of the film. A collodion film simply iodised, and without free nitrate, is as insensitive as an iodised Daguerreotype plate, but a bromo-iodised collodion film without free nitrate may be rendered as sensitive as a bromo-iodised silver plate. In the wet collodion process the most exalted sensibility is conferred upon a simply iodised film by the presence of free nitrate of silver; but you cannot retain free nitrate in a dry collodion film, because it not only crystallises on drying, but by becoming concentrated as the water evaporates dissolves the iodide of silver, and forms a curious and interesting double salt, the exact properties of which have not yet been fully investigated. You cannot even retain a perceptible trace of free nitrate entangled in a dry collodion film without introducing an element of instability, and consequent uncertainty in your work. The principle, therefore, of preparing a rapid dry collodion plate consists in using bromo-iodised collodion, and removing all the free nitrate, which is the element of instability.

But the image produced upon a bromo-iodised silver plate, developed with mercury, is extremely thin and superficial, as may be proved by transferring it to a sheet of gelatinised paper. And, similarly, the image developed by pyrogallic acid, upon a dry bromo-iodised collodion film, is thin, and too transparent to yield a good printing negative. It is necessary, therefore, to apply to the film a coating of some organic substance, in order to give density to the dark parts of the negative. Many substances have been employed for this purpose, viz., gelatine, metagelatine, albumen, various syrups, gum arabic, infusion of malt, tannin, &c., &c.; and experimenters have, almost without exception, exhausted their ingenuity in varying these preservative coatings, as they are called, instead of seeking in the use of bromide for the true accelerating agent. The preservatives named have not all the same effect; and, besides affecting the sensitiveness of the film, they also determine the colour of the finished negative, gelatine and gum giving a black, tannin a red, and albumen a yellowish colour to the deposit in the dark parts. Much therefore depends upon the selection of a proper preservative, when the most exalted sensitiveness is required.

One more difficulty remained to be overcome, and it is this:—When a collodion film has once been allowed to get dry, and is wetted a second time, it is very liable to split and leave the glass; or, if a preservative has been applied to it, it is very liable to rise in blisters, which spoil the negative. But this may be prevented by giving the glass plate a preliminary coating of India-rubber dissolved in kerosolene.

The operations in the rapid dry process are, therefore, as follow:—

1. Clean the glass plate, dry it thoroughly, and apply to it a solution composed of one grain of India-rubber dissolved in an ounce of kerosolene.

2. Coat the plate thus prepared with bromo-iodised collodion, containing an equal number of atoms of iodine and bromine, added in combination with cadmium. There should be about five grains of mixed iodide and bromide of cadmium to the ounce of collodion.

3. Excite the film in a bath composed of thirty grains of pure recrystallised nitrate of silver, slightly acidified with nitric acid.

4 Wash off all the free nitrate of silver, and pour over the film a preservative composed of twenty-five grains of gum arabic, freshly dissolved in an ounce of water. Let it dry spontaneously, and, before putting the plate into the dark slide, dry it again thoroughly before a hot flat-iron.

5. Give the same exposure as for wet collodion.

6. Develop the picture by first wetting it with distilled water, and then pouring over it a developer consisting of one ounce of distilled water, two grains of pyrogallic acid, two scruples of glacial acetic acid, and a few drops of a weak solution of nitrate of silver. The image appears immediately, and very soon acquires the necessary intensity.

7. Fix the negative in the usual way with a saturated solution of the hyposulphite of soda or lime, and, when dry, varnish it with spirit varnish.

Negatives taken in this way are equal in every respect to those taken upon wet collodion plates, and the process is as simple as any of those which are now employed for slow dry plates.

Discussion having been invited,

Mr. F. MAXWELL LYTE said:—My experience having been somewhat considerable in the use of dry collodion, I venture to make a few remarks on the paper. There is no doubt of the fact that a combination of bromide

with the iodide of silver is decidedly advantageous as an accelerator in the case of sensitive dried films of collodion; but that this introduction of bromine should in any way be looked upon as new, when employed in this manner, is a mistake. Bromides have been very long employed in landscape photography as a useful adjunct, and have been alternately vaunted by various practitioners as accelerators, and the contrary. One thing seems certain, that where green forms one of the prevailing colours in the picture, their impression is most decidedly facilitated. The proportion of bromide proposed to be introduced by Mr. Sutton is, in my opinion, rather too large—one part in four of iodide being the proportion which I find to work best. The use of gum-arabic as a preservative coating, combined it is true with a very small portion of honey, was mentioned by me in the *Journal of the Photographic Society of Paris* many years since, but subsequently discarded as giving a tendency to fog; but perhaps my decision in this respect may have been hurried, as I may not have washed the plate thoroughly enough, and certainly the proposed acid nitrate bath in which Mr. Sutton renders his plates sensitive is likely to diminish this fogging tendency. This fogging it was which induced me to substitute the metagelatine for the gum-arabic, which I subsequently did. Now, however, I am led to believe that the following modification of the resin process employed by the Abbe Desprats is the simplest and best process for dry collodion:—Add to the collodion one-fifth per cent. of the resin of scammony: that which has been purified and bleached with animal black is to be preferred. Sensitise in a bath of seven per cent. nitrate of silver, slightly acidulated with acetic or nitric acid; wash the plate most thoroughly in clean rain water, or in distilled water, to which has been added 0·1 per thousand of common salt or chloride of ammonium, and let the plate become dry in a place thoroughly free from dust. The exposure is less than that required with any other dry process with which I am acquainted, and is not above half more than that required for moist plates. The development should be performed by first moistening the plate with distilled water and then pouring on a solution containing one part of pyrogallic acid, ten of acetic acid (glacial), and five hundred of water. Fix with a solution containing about one of cyanide of potassium to 100 of water. It is not absolutely necessary to employ for the *first* washing bath distilled or rain water, with an addition of chloride, as in actual experience I have obtained very good and perfect results with spring water; but, considering the varied nature of the salts found in spring waters, it is prudent to proceed as above recommended. The second washing should always be performed in water as pure as can be obtained—in distilled water if possible—and especially the presence of any bicarbonates is to be avoided. The present is only a sketch of what I propose to present hereafter in a more detailed form, and was only elicited from me by hearing Mr. Sutton's paper. The acceleration of which Mr. Sutton speaks may very probably depend on the action of the gum with which he coats the plate. Gum-arabic is the lime salt of a very weak acid. In contact with nitrate of silver it is decomposed, with formation of the gummate of silver; but no such double decomposition takes place when it is placed in contact with the bromide or the iodide of silver. The action of light, however, on these latter compounds is to eliminate their acid elements and separate the silver, and the iodide and bromide set free would tend to fix themselves on the lime in the gum. If the washing be not thoroughly performed, however, gummate of silver will form, which blackens in contact with the developer, even without previous exposure to light. It is, therefore, with much propriety that Mr. Sutton insists on a careful washing of the plate after sensitising and previous to the application of the gum. In the preservative process of which I have given a slight sketch, I have chosen to employ the resin of scammony, as it is soluble in ether, and, from its friable nature, seems to more completely disintegrate the collodion and render it pulverulent—a condition most essential to obtaining intensity on dry plates. The collodion I employ is prepared just as I have already explained in a paper published some time since in the *Journal of the Photographic Society.**

SATURDAY, OCTOBER 4.

Details of a Photolithographic Process, as Adopted by the Government of Victoria, for the Publication of Maps.

By J. W. OSBORNE, of Melbourne.

TOWARDS the end of the year 1859 I read a paper in Melbourne, before the Philosophical Institute, now the Royal Society of Victoria, on a new photolithographic process, invented by me, and patented in the colony on the 1st of September of that year. I have now the honour to bring this subject under the notice of the British Association in such a form as to enable every one skilled in photography and lithographic printing to execute it with certainty and success.

The process I am about to describe has been for upwards of three years in active operation in the Department of Crown Lands and Survey, at Melbourne, the first map for sale having been printed on the 3rd of September, 1859, since which time many hundred maps and plans, of all sizes, have been produced by its means. The Victorian Government has also recently erected an office suited to the requirements of the process, and offering every facility for its successful prosecution.

* Mr. Lyte, at our suggestion, prepared a report of his remarks for the press, and at his request we publish it in preference to giving our own reporter's notes.

Before proceeding to give exact details, I shall sketch out the leading characteristics of this photolithographic method, with the intention of making more intelligible the object of the careful manipulations which are subsequently enjoined; premising, also, that the remarks embodied in this paper have reference only to the reproduction of drawings or engravings in simple black and white, without the gradual passage from dark to light, known as half-tone, and peculiar to mezzotinto engravings, chalk drawings on stone, and, in an eminent degree, to ordinary photographs from natural objects

A reproduction from stone being required of a drawing or print of the nature I have described, the first step is to obtain a negative on glass, bearing to it the desired relation as regards size. From this a photographic positive is printed by light in the pressure-frame, upon paper coated on one of its sides with a smooth surface, consisting of gelatine and bichromate of potash, with an admixture of albumen. This positive is now covered with lithographic re-transfer ink by passing it through the press, inverted upon a stone, which has been evenly covered with that substance by the printer's roller. The next operation is to float the paper with its inked side upwards upon a tray of boiling water, the effect of which is, in the first moment, to fuse the thick greasy ink, giving it thereby more homogeneity, and, subsequently, to coagulate the albumen in the coating, and, as the water cools, to swell and soften the gelatine which, protected by the opaque portions of the negative, has not suffered the well-known alteration by the actinic influence in the presence of the chromium salt. As soon as the blackened print has remained a sufficiently long time upon the surface of the water, a little gentle friction will be found to remove all the ink, save that in contact with the altered positive work upon the paper, and a subsequent flooding with boiling water will sweep away everything that is soluble upon the surface of the print, leaving behind the coagulated albumen only in the form of a smooth tenacious film under the design.

After this print is properly dried, it becomes what is technically known as a "positive transfer," and is, in fact, a photograph of the original in re-transfer lithographic ink, so constituted as to admit of the design upon its surface being transferred to a stone in the ordinary way known to lithographic printers. From the drawing thus obtained the usual number of copies can be printed, the quality and permanence of the work upon the stone being in no way influenced by its photographic original.

To recapitulate: I would first draw attention to the negative, upon the quality of which depends the excellence of the works subsequently produced. Its characteristics should be extreme sharpness of definition, freedom from distortion of any kind, absolute transparency of the shadows, and considerable intensity. Unless these conditions are fulfilled it is impossible to produce photolithographic work which will compare favourably with that produced by hand. As may be expected, much will depend upon the lens employed, and in this respect I cannot do better than recommend the use of Mr. Dallmeyer's triplet, which I believe to be unsurpassed for copying purposes, and to the excellent qualities of which I gladly bear witness. The method I have systematically followed to produce negatives of the prescribed quality is as follows:—Bearing in mind the fact that in copying the photographer is, even under the best of circumstances, working in a weak light, owing to the near proximity of the original to the lens, and the small stop required, it will be found best to develop with iron, and to abandon the idea of getting sufficient intensity in the first instance. Intense clear negatives may occasionally be produced under favourable circumstances, fit for silver prints; but not as a rule in all weathers, or in the routine of daily work. I therefore recommend the use of intensifying agents, of which the most important is Major Russell's developer. Previous to its use, however, I have found it necessary to resort to a method of "clearing up," which will, I believe, be found new and useful. This consists in re-iodising, to a very slight extent, the deposit in the film after fixing, by the use of free iodine, and then dissolving off the iodide of silver thus formed. In practice it will be found best to prepare a saturated solution of iodine, in a two-grain solution of iodide of potassium. Pour a few drops of this into a developing glass, and dilute with water. Treat the fixed plate with this after very careful washing, until the liquid becomes colourless. The operator will then be assured that all the free iodine has expended itself upon the silver in the film, and by judging of the colour of the dilute solution he uses, a most accurate estimate may be formed of the amount and intensity of the change it will effect upon the negative. By proceeding in this way, the deposit, which in my opinion is always to be found upon the transparent shadows, even in the clearest pictures, is totally swept away, leaving them incapable of determining the precipitation of an additional quantity of silver. Major Russell's admirable developer for his tannin process may now be used, and the development pushed to any desired extent, without fear of destroying the contrast, or dimming the shadows in the slightest degree. To obtain the necessary intensity by this method alone, would occupy too much time, the negative being invariably a very feeble one to begin with, in consequence of which it will be found well to wash the plate, when a certain amount of intensity has been obtained, and *immerse* it in a saturated solution of bichloride of mercury, in water acidulated with hydrochloric acid. Afterwards apply a weak solution of iodide of potassium, increasing its strength gradually until the deepest yellow colour pervades the whole depth of the deposit, when the yellow may be

changed to a dark olive with advantage by flooding with a one-grain solution of chloride of gold.

The glass for negatives treated in this way should have the edges roughened for obvious reasons, and it is also very advisable to pour over the finished negatives, while wet, a solution of gum arabic, of such a strength as to leave no gloss when dry. This precaution will be found to prevent the peeling off of the film while drying, and to obviate the necessity for varnishing, as the plates will keep perfectly well if stored in tin boxes.

The next step in this process is the manufacture of photolithographic transfer paper. For this pupose introduce 800 grains of Nelson's opaque gelatine into a flask, add 440 grains of finely-powdered bichromate of potash, and cover both with eight ounces of cold water. Place the flask in a dark place for two or three hours, for the purpose of allowing the gelatine to soften and swell. After the lapse of that time its contents are to be melted by immersing and agitating it in hot water, after which the temperature must be lowered to abont 110° F., and two liquid ounces of albumen added and thoroughly mixed. About twelve or fourteen half-sheets of plain positive paper of good quality, having been slightly damped for some time previously, are now to be coated with this solution in the following manner:—A small tin trough is provided, about eleven inches long, three inches wide, and one and a-half inch deep, into which the gelatinous solution is carefully strained. The trough is made fast to one end of a board, upon which the positive paper is placed, and when the temperature of its contents has fallen to 85° F., the operator, laying hold of a sheet by two adjacent corners, draws it slowly over the trough, while an assistant presses it into contact with the surface of the liquid by means of a piece of wood of suitable form.

This is by far the best method of coating paper with gelatinous liquids with which I am acquainted. It is economical, ensures great regularity, and enables the liquid used to be retained at the necessary temperature without difficulty. I believe it would be found useful by the manufacturer of common albumenised paper.

After being coated, the sheets are to be hung up and dried in the dark; the room used for that purpose requiring to be artificially warmed in damp or cold weather. In preparing this paper, great care must be bestowed upon the quality of the albumen used: the eggs from which it is obtained must either be taken when but a few hours old, or they must be buttered with the freshest butter while yet warm, in which case they will keep, if taken care of, for about a fortnight. If this rule be not attended to no certain results can be looked for.

The positive transfer paper thus made is, when perfectly dry, to be rolled or glazed in a press, so as to improve the regularity of the surface, enabling it to be brought into the closest contact with the negative. The average time required for its exposure in the pressure-frame is, in Victoria, about half a minute: in this country I do not think it would exceed double that time. When the paper is taken from the pressure-frame it is inked by the printer in the manner already described, a somewhat stiff ink being used for the purpose. This should not be applied to the paper in too heavy a coating, but should just allow the stronger parts of the positive work upon the print to be dimly perceptible through it. To effect the coagulation and soaking I have made use of tin trays, of an inch and a-half deep, and otherwise of dimensions to suit the size of the negatives. The water used must be actually boiling, and about a pint of it should be poured into the tray and then rejected, before the latter is filled for the reception of the inked print. This is done to prevent the cooling of the water used for coagulating, which, without it, would be so lowered in temperature as to effect its object with difficulty. The time required for the proper soaking of a print is variable, and must be fixed in every case by the judgment of the operator; but an hour may be named as the average interval which should elapse before the print is ready for "washing off." The general appearance of the blackened surface, the relative differences in elevation and gloss which the positive portions present as compared to the rest of the inked face and the temperature of the water, are the guides which experience alone will make valuable.

The soaking having been completed, the print is placed upon a smooth board, and the requisite friction for the removal of the superfluous ink applied with a clean and dense sponge moistened with water.

Here, again, it is hardly possible to give directions which will ensure perfect success in the hands of one inexperienced in the process; but I may state that the amount of friction which the print will bear without injury will not fail to surprise the operator who washes one off for the first time.

When the details upon the paper have acquired the greatest degree of sharpness of which they are capable, the washed-off print is ready for "scalding." For this purpose it is attached to a flat board, and placed in an inclined position in a large trough. A very large quantity of boiling water is now poured upon it in such a way as to pass both above and below the paper. This is an important, indeed an indispensable, operation, its effect being to carry away every particle of soluble gelatinous matter, which, were it allowed to remain, would inevitably "stop out" the work during the subsequent operation of transferring, and it is here that the albumen, by resisting the action of the boiling water, shows how admirably it is fitted for the part it has to play, namely, to ensure, by its sticky nature when damp, the immovable adhesion of the paper to the lithographic stone, during the process of transferring in the press.

Finally, the scalded print is dried by floating it upon the surface of the water, which has been described as having just passed over it; a border of ink left on purpose round the edge of the paper preventing the hot water from flowing in upon it, while the heat from below causes the evaporation from the albumen surface to be completed in a few moments.

By adopting this method the print dries perfectly flat without the formation of irregular corrugations upon its face, which would become receptacles for drops of water, containing, in all probability, gelatinous substances in solution.

This photographic print in greasy ink, or "positive transfer," as it is called, is given to the printer—after the drying of the back has been allowed to take place spontaneously—who transfers it to the stone in the usual way, treating it throughout as if it had been produced by the hand of a lithographic draughtsman.

I beg to lay before the members of the Association specimens of hand-drawing—both mathematical and artistic—woodcuts, engravings, and lithographs reproduced from the stone by my method. Also a specimen of photozincography, and of transfer to the surface of waxed copper, as a guide to the engraver. And, lastly, I should remark that several of the photolithographs here exhibited are produced by joining two or more positive transfers, from different negatives, before laying them down upon the stone. the number joined in this way amounting in one case to eight; from which it will be seen that a large camera is by no means necessary for the production of a large copy, nor is there any limit, but the size of the lithographic stones and press at command, to that of the finished photolithograph.

A discussion on Mr. Osborne's paper then took place.

Mr. F. Maxwell Lyte: I wish to ask Mr. Osborne one question—Was your process published before M. Poitevin's?

Mr. Osborne: No, it was not. My process was made known in November, 1859, and adopted at Victoria in that year, and was pronounced to have by far a comparative excellence.

A Member: I should like to know whether Mr. Osborne's process is not a transfer, obtained by means of photography?

Mr. Osborne: In answer to that, I may say that my process is the original one, and was the first introduced into practical operation. The use of a medium such as photolithographic transfer-paper is sufficient to convey the photographic image to the stone.

Mr. Wyld, M.P.: Was the process in use in Victoria before that of Colonel James at Southampton?

Mr. Osborne: Yes, it was; about six months. I was the first who introduced a practical photolithographic process such as that, at the Surveyor-General's Office, at Victoria.

Mr. Wyld: Is there any difference?

Mr. Osborne: Yes, there is a difference. Colonel James uses gum-arabic, while I use gelatine. He omits the use of albumen altogether, and transfers to zinc. I produce mine from stone, which is by far the best, preventing adhesion.

Professor Emerson, of Troy University, U. S.: What method is used for focussing?

Mr. Osborne: We focus by a magnifier, which is attached to a ground-glass by a plate-holder. I believe by this means our method of focussing is the more exact and accurate. Professor Emerson has informed me of his method, which I am well convinced is much more accurate than the one we have been using. A great deal, however, depends upon the lens; and we have not yet got a lens good enough for the purpose. Sometimes a lens can be racked backwards and forwards an inch or more without a sensible change in the focus. I exhibit a county map, which, for all practical purposes, is good enough.

Mr. F. Maxwell Lyte: In regard to focussing, I venture to say that the best method of focussing is by a glass coated with collodion and allowed to dry. It is quite impossible to focus well with a ground-glass simply; but, so soon as a magnifier is applied, then it comes out most beautifully.

Professor Emerson approved of Mr. Lyte's method of focussing, so far as it went; but, with the aid of a magnifier of a high power, they could get almost an absolute focus. The method of focussing he had recommended to Mr. Osborne, and which he could not but consider far superior to the plan proposed by Mr. Lyte, was to use a plain glass in conjunction with a microscopic focusser of about forty or fifty diameters. Slightly scratch the further side of the glass with a diamond, and adjust the microscope to bring out all the fine details of the scratches; then, by using the microscope thus adjusted, the image formed by the lens of the camera could be focussed with remarkable accuracy. It was idle to say that the lens of a camera could be racked in and out an inch without making a difference in the focus. By the method he proposed it could be seen that a movement of the one-thousandth of an inch would make a difference. This method would also enable the operator to gauge the difference between the visual and actinic foci with equal precision. It was a matter of great importance to adopt a method of focussing that would reproduce all that could be done. It was evident to him, from the example of that map, that it had not reproduced what it ought, or as might have been obtained by a sharper focus.

Mr. Osborne fully admitted the importance of focussing. He (Mr. Osborne), referring to the specimen maps produced, said that the process was equally applicable to zinc; but he preferred stone. The specimen map which he then produced was a common lithograph, the accurate

drawings being from the Surveyor-General's Office at Victoria, obtained in the general way. In a new colony like Victoria an immense number of maps was required. For instance, persons go and buy land, and maps were published to enable them to see what they were going to buy. The size was not influenced solely by the camera. They first got the photograph upon surface; then printed it upon stone in the usual way. There were joinings, but no one could see where the joinings took place. The maps were published at two guineas, and so on; but the process did not necessarily depend upon a large establishment like the one at Victoria. No touching was required, and there was not one single case in which he was called to account for inaccuracy. He had copied maps, and the Surveyor-General had testified to their accuracy. They were said to agree in a remarkable manner, there not being the slightest shade of difference. The great difficulty lay in the paper: in making a large map it swelled, and in joining seven or eight pieces the difficulty arose in seeing that the joinings were not to be detected.

TUESDAY, OCTOBER 7.

On Some of the Difficulties which Present Themselves in the Practice of Photography, and the Means of Avoiding Them.

By F. MAXWELL LYTE, M.A., F.C.S.

Manufacture of Pyroxyline One Cause of Spontaneous Decomposition.

ONE of the principal causes of the spontaneous decomposition of pyroxyline seems to be a remnant of acid left by imperfect washing.

In this condition pyroxyline, and especially that which has been prepared in weak acids, is very prone to decomposition, and possesses, moreover, another disadvantage, viz., that it produces a collodion which, when iodised, turns very red, and soon spoils the nitrate bath in which it is used.

It has been proposed, as a remedy, to add to the last washing water a few drops of liquid ammonia. Now, whenever this has been done, I have always found that much of the pyroxyline became insoluble, and that the portion which dissolves only produces a rotten film easily broken in washing.

Another mistake in making pyroxyline is attempting to add too large a proportion of the material, whether cotton, paper, or flax, which it is intended to be converted. The proportion should never exceed ten per cent. of the nitric acid employed: beyond this point a further addition is nearly sure to involve failure of more or less of the product. And this is reasonable; for in proportion as pyroxyline is formed, nitric acid disappears, and is substituted by the elements of water, or, what is the same thing, is substituted by NO^4, and HO is produced. A point is consequently arrived at where the mixed acids become too dilute to produce any further action. Up to the addition of seven per cent. the conversion of the pyroxyline is nearly simultaneous with its immersion; but for the remaining three per cent. of lignine added, the conversion is more gradual, requiring four or five minutes to complete it. So that if we add rather too much material, the effect is distributed over the whole quantity, and a large portion remains insoluble.

The only sure plan is to add not more than ten per cent. of the weight of the nitric acid employed, and instead of removing the last traces of free acid with ammonia, I am in the habit of adding a few grammes of an alkaline acetate to the last washing water. In this water I allow the pyroxyline to soak for a night, and then withdraw it and wash again and dry it. Pyroxyline so prepared is very stable; and, if the temperature of the mixed acids has been correct, and their strength accurately examined before use, the pyroxyline will be found perfectly soluble, and will remain so for years.

Half-tones.

Much has been said about different samples of collodion producing better half-tones than another.

I believe the whole—or nearly the whole—gist of landscape photography on collodion, as far as gradation of tint goes, to consist in obtaining the thickest possible film. My theory on the subject is as follows:—Iodide of silver is a yellow salt, and offers more or less resistance to the passage of the actinic rays. The greater, then, the body, so to speak, of the film, the longer the time which the rays require to produce their effect through its entire thickness. Now, in what consists the excellence of a positive print? Why, in possessing fine gradations of half-tone, blending insensibly into the deep shades and high lights. No sudden and severe contrasts exist, as a rule, in nature.

Now, we know by experience that if a plate be over-exposed, the high lights are solarised, as it is termed, and become transparent, printing through and destroying the brilliancy of the positive; while, on the other hand, if a plate be under-exposed, the half-tints never appear at all. Now, in landscape we have often at one and the same time deep greens or red rocks in the foreground—the details of which must be given, in order to produce a harmonious picture—and blue distances, which must be impressed in order to give character to the landscape.

The reproduction of such a combination is looked upon by many photographers as a complete paradox; but use a thick film, and the difficulty is solved. The yellow iodide of silver offers the necessary resistance to the actinic rays to impede solarisation in the high lights, while we are enabled to expose the plate sufficiently long to impress the details of the deep shadows. Our choice should then fall on that quality of pyroxyline of which we can introduce the greatest proportion, without rendering our collodion too glutinous; and in this point of view I find that prepared from paper to be much superior to any other, as I have remarked in other papers on the same subject.

Having mentioned the subject of solarisation, I may be excused for venturing a new view as to its cause. We all know that, by various degrees of exposure, the sensitive atom of iodide or bromide of silver, whichever it may be, assumes successive tones of colour, in which one or more of the primary colours prevails. Now, may it not be that the superposition of these various tones of colour, as would obviously occur in a plate where the actinic influence had not penetrated too completely the collodion film, and produced the ultimatum of effect, should produce opacity; whereas, if the ultimate effect had traversed the entire thickness, a yellowish or reddish transparence might be the result—or, in other words, when the molecules of reduced silver are all in one and the same position, they may become capable of transmitting certain luminous vibrations. When their position is variable, they cut every vibration off.

Drying of the Film.

In hot climates a difficulty presents itself—the means of obviating which it may be useful to describe.

When we attempt to work in a tent under the influence of a hot sun, the plate frequently is found to have become so far dry on removal from the dark slide, that when we attempt to pour on the developer it flows unevenly, and the finished negative shows rings of unequal development, and it often happens, under the same circumstances, that the nitrate of silver solution accumulates at the lower edge of the plate, and mixing with the developing solution flows back in streaks over the plate and produces dark lines and marblings; further, it sometimes occurs that in our attempts to obviate these defects the developer is thrown too suddenly on to the plate, and washing off all the nitrate of silver produces a transparent spot where it falls, and often a sort of mark on the centre of the plate as if a fine comb or a brush had been passed over it.

Now, in order to obviate these defects, the best mode of proceeding is to pour over the plate a little water, to which has been added a small dose of acetic acid, say 0·1 per cent., and when the plate has been thoroughly washed with this solution, then to apply an iron developer. The nitrate of silver having been for the most part removed, a very feeble image only appears; but, on the application of a solution of pyrogallic acid, with the addition of a little free nitrate of silver, the image comes out in far finer detail than by any ordinary treatment that can be used, and with a harmony of effect which is quite surprising. In the top of the tent in which I work I have a sort of chimney of linen, into which I stuff a tuft of grass or of fern, and which, while it effectually bars the entrance of light, allows a free circulation of air.

I find that the protosulphate of iron, which is somewhat reddened by the presence of a per-salt, is that which answers best for the development of negatives; and with this view I keep a solution of the per-acetate of iron by me, which I add to my iron developer if the protosulphate with which it has been made be of too pure a nature.

Varnish.

It has always been a problem among photographers to find a good varnish. The amber varnish, which is decidedly the best hitherto described is faulty in many respects.

1st. It is very expensive to use, both on account of the primary cost of the materials, and of the extreme volatility of the ether and chloroform, which form the solvents.

2nd. The negatives varnished with it are liable to crack in frosty weather should the slightest condensation of moisture take place in the box in which they are stored, and the same effect often arises where they are placed in contact with a sheet of positive paper not perfectly dry.

The solution of gum benzoin in alcohol is liable to cover the negative with minute pin-holes from the crystallisation of the benzoic acid it contains, the crystals breaking up the film in numerous minute points; and, lastly, the solution of bleached lac is inadmissible, as in a hot sun it becomes tacky and sticks to the positive paper.

The same defect belongs to the varnish of Sœhnée Freres, of Paris. In the South of France, where I work, I have lost many fine negatives through each of these causes. I now use a varnish which I consider perfect in every respect, made by dissolving ten to twelve per cent. of the purified resin of jalap in alcohol of ninety-five per cent. This varnish, while it does not seem to have as great a liability to chill as some other varnishes, is hard and resistant, and gives a body to a negative such as few others will give, and it never adheres to the positive paper under the influence of the hottest sun.

Printing.

Now, as to printing positives, I wish to draw your attention to one or two points, but time will not allow me to do more. I wish to speak, in the first place, as to the necessity of adjusting the strength of the nitrate sensitising bath to the amount of chloride contained in the paper which is to be prepared upon it. The moment the paper is laid on the nitrate bath it decomposes the nitrate of silver on the surface of the solution with which it comes into immediate contact with formation of nitrate of sodium and chloride of silver. The solution of nitrate of sodium thus formed possesses a far less specific gravity than the nitrate of silver below

it, and does not so easily mix with it as might be supposed, and, consequently, forms a film on the top which, lying between the surface of the paper and the nitrate of silver below, forms a sort of carrier which dissolves out the salt without decomposing it, and disintegrates and dissolves the albumen instead of coagulating it. Under such circumstances a white precipitate of chloride of silver often renders the bath turbid, and the finished proof has a dull, grey. cold tone. This defect is only to be remedied by so proportioning the nitrate of silver in the bath to the chloride in the paper that the paper shall find enough nitrate in the part of the bath into direct contact with which it is brought to convert all its chloride into chloride of silver, and even leave a small excess.

By adding to the albumen about 0·1 per cent. of the crystallised phosphate of soda, 2 Na O HO Po_5 + 24 HO, it will be found that the discolouration by albumen is nearly entirely prevented, and if the latter ever becomes coloured it may always be completely decolourised by adding to it a solution of a mixture of the crystallised carbonate of soda with crystallised phosphate of soda, in about the proportion of two to five, and dissolved in water in the proportion of seven per cent. For every ten grains of such a solution added, one grain of solid nitrate of silver must also be dissolved in the bath, in order that it may not become weakened, and the bath filtered till it becomes clear. Thus treated, a positive bath not only becomes decolourised but retains its transparency, and does not change colour by use for a long time afterwards.

Remarks upon the above paper having been invited,

Professor Emerson, of Troy, U.S., said he had been much interested in hearing Mr. Lyte read his paper, in which there was much to commend; but, with regard to the use of a thick film of collodion being a *sine qua non* for landscape photography, he must differ from Mr. Lyte, as his own experiments upon that point had led him to believe that a thin alcoholic collodion, properly managed, would give as good results as a thick one. This was especially the case in his experience of the tannin and the Fothergill processes. Again: as to the method recommended by Mr. Lyte for avoiding streaks and stains in the development, he could endorse it as a good one, as he had tried it with success in wet processes. With regard to the preparation of the sensitising bath for albumen paper, he was sorry he could not concur in Mr. Lyte's plan as certain to relieve the difficulty. He had engaged in a laborious series of experiments on albumenised papers, and had not been able to arrive at any fixed rule for the composition of the nitrate of silver sensitising bath—simply because the samples of paper varied so exceedingly in their quality. This was the case even with the same lot of paper, one sheet differing from the next, and so on. In the present state of affairs he regarded *experience in printing* as much more likely to lead to a proper mode of sensitising than any empirical formula. A good method of keeping clear a sensitising bath for albumenised paper was to mix it with alcohol in the proportion of one-third to two-thirds of water, keeping up the amount of silver per ounce. This method had been repeatedly published in the French journals, and he (Professor Emerson) had found it answer the purpose.

Mr. Lyte responded to some of Professor Emerson's remarks. Under the conditions alluded to he would regard an alcoholic collodion substantially the same as a thick one. He admitted the difficulty of determining anything with accuracy as albumen paper is now manufactured. He thought it would be well if the makers of albumenised paper would mark on the paper itself the exact proportions of salt used in each sample: that would simplify very much the labour of sensitising it, and the uncertainty atttending it.

On a Simple Method of Taking Stereo.-Photomicrographs.

By Charles Heisch, F.C.S.,

Lecturer on Chemistry at the Middlesex Hospital Medical College.

The production of stereo.-photomicrographs which should give the effects seen in the binocular microscope has been for some time a *desideratum*. Like many others I have been engaged in attempts to meet the various difficulties which were encountered. The use of the binocular microscope, as the instrument with which to produce the pictures (which at first sight appears the most simple plan), presents several difficulties.

1. The two bodies standing out at an angle to one another precludes the use of one plate on which to take two pictures.

2. The light of that picture which has been reflected by the prism is always weaker than that directly seen, so that it is difficult to regulate the time of exposure.

Under these circumstances I devised the following plan, which answers perfectly:—A microscope, with its eye-piece removed, is placed in a horizontal position, and fitted to an ordinary sliding-back single-lens stereoscopic camera. The ordinary adapter for the object-glass being removed, its place is supplied by one carrying a tube which can be turned half-round inside it by means of a lever from the outside; sliding in this tube is a second, furnished with a stop which cuts off half the pencil of light coming from the object-glass—in fact, occupies the same place as the prism in a binocular microscope.* The distance of this stop from the back of the object glass is adjusted experimentally by sliding the tube which carries it in and out till the image thrown on the ground-glass of the camera is equally illuminated in whatever position the stop may be turned.

The prepared plate being put in its place after carefully focussing the object, the first picture is taken; the plate is then shifted, the stop turned half-round, and the second picture taken on the other half of the plate.

If the object be of considerable thickness, more effect may be produced by focussing the upper surface for one-picture, and the under surface for the other. The adapter for the object-glass, with its tube and stop, I send herewith: it can be applied to any microscope.

* The principle of this adaptation is identical with that employed by Mr. Smith, and alluded to by Dr. Maddox in his recent paper, the stop being by the two latter applied in front of instead of behind the objective.—Ed.

Photozincography.—On Thursday last the following letter appeared in *The Times*, in consequence of some remarks in the report of the discussion which followed the reading of Mr. Osborne's paper on his photolithographic process in Section B, as given in another column:—

Sir,—In the report of the proceedings of the Chemical Section of the British Association which appeared in *The Times* of yesterday Mr. J. W. Osborne's account of the process invented by him at Melbourne, Australia, is given, and which he has named photolithography.

"In the course of subsequent discussion," the report says, "it was elicited that one of the principal claims to novelty involved was the fact that Mr. Osborne's process was the first in which the image on the stone was effected by means of a transfer. The process of Colonel Sir Henry James, used at Southampton for the reproduction of Ordnance maps, was analogous to it in this respect, but was first used six months subsequently to the process of Mr. Osborne."

The inference which may be drawn from this is that I have adopted Mr. Osborne's process, or something very analogous to it, without any acknowledgment. If Mr. Osborne had only stated that my discovery had been made independently and without any knowledge of the result of his labours, it would be unnecessary for me to address you on this subject; but the facts are that an account of the process adopted by me is given in my report to Parliament for 1859, with the copy of a small deed printed by it; that Mr. Osborne, in a letter dated Melbourne, 16th January, 1860, which is printed in the *Photographic Journal* of April, 1860, says, "A positive is printed from this negative upon a sheet of paper so prepared that the image can be transferred to stone," but he gives no information as to what the nature of the preparation is; and, in fact, he appears to have studiously avoided divulging the nature of his process in England, that he might be able to take out a patent for it, and only made it known when he found we had anticipated him.

I have been most anxious to do full justice to Mr. Osborne, as you will see by reference to the fifth page of the preface to the small work on photozincography, &c., which has been just published by Messrs. Longman, and of which I send you a copy.

I am, Sir, your obedient servant,

HENRY JAMES, Colonel Royal Engineers.

Ordnance Survey Office, Southampton, Oct. 7.

OBSERVATIONS ON THE RECENT COPYRIGHT ACT.*

By Andrew Mure, Esq., Advocate, Edinburgh.

It is now a century and a-half since the legislature passed the first statute which gave to the author a right of property in a published work. Since that time the right to such literary property has rested exclusively on statute. In both ends of the island—whether rightly or wrongly I do not here discuss—it was long ago settled that the author who had given to the world by publication his thoughts and ideas had no right at common law in these; and the evils and injuries to authors resulting from this state of matters were so deeply felt that the statute interfered. Between that date and the present no fewer than nineteen statutes have been enacted, for regulating and controlling the rights of proprietors and authors of books, or for extending protection to kindred productions, such as engravings, prints, and dramatic compositions. The principle of all these statutes is, that if the purchaser of a single copy of a book or other literary work can, by the rules of common or natural law, be supposed to acquire thereby all the uses of which the copy is capable, including the power of indefinite multiplication, he purchases for a mere trifle what may perhaps be a mine of wealth. The price he has paid is grossly inadequate to the uses to which such a state of law enables him to put the purchase that he has made. No one could justify the right of the purchaser of a single copy to the profits of indefinite multiplication by himself. The author of the work is alone entitled to these profits.

It is on this principle that the law of copyright is based. It is a principle, however, of bargain or compromise between the public and the author; for justice has to be done to the public as well as to the author. Hence certain general rules have for many years past distinguished the legislation on the law of copyright.

1. It commences only from the date of the *first publication* of the work.
2. The *duration* of the right is *limited* to a certain number of years.
3. *Registration* is an essential condition of the acquisition of copyright by an author.
4. It is required that the work to be so registered shall be *original*.

Keeping in view these rules, I now come to the legislation of the present year. It was necessary not only to protect the artist and the photographer, but also the public and the patron of art. It is believed to be the fact that an eminent photographer had no sooner published the likeness of some illustrious personage, or a representation of some beautiful scene, than spurious copies of the work were multiplied in enormous numbers by unscrupulous persons, who procured, perhaps, only a single copy of the original work. The name, too, of the original author was falsely used as a guarantee of the authenticity of the work. On the other hand, the public were at the mercy of any unscrupulous photographer. If a portrait were ordered, or a work of any importance commissioned, the party who should have remained sole proprietor was liable to find copies of his portrait, or of a work he had hoped to keep private, in the hands of all who chose to give a small sum for it.

* Read at a meeting of the Edinburgh Photographic Society, October 1st, 1862.

In painting the state of matters was much worse. Avowedly, the necessity for legislative relief had become essential mainly from the gross injustice to which the proprietors as well as painters of pictures had become exposed. Artists of the highest eminence were no longer satisfied with the honest products of the labour of their own hands. If a patron of art give a commission for or purchase a picture at a high price, he is entitled, in all fairness, not only to possession of the original picture, but also to the exclusive right to it, so that none shall make a copy without his consent. In London it was notorious that some of the most eminent artists sold numerous copies of the same subject without the consent of the proprietor of the original picture; and, in many cases, these copies were not made by the artist himself, but by assistants poorly paid for their labour. On the other hand unscrupulous persons became purchasers of pictures, and multiplied copies of them to the injury of the artist. I notice that these were the evils which had to be provided against, because the statement of them will more readily enable the Society to comprehend the provisions of the Act of Parliament. To make the latter known to photographers is the sole object which I have in view. I do not wish to enter into any disquisition upon the principles of the law of copyright, or to suppose difficult cases which may arise under the present statute. I wish merely to set forth, in plain language, what is enacted.

The statute proceeds on the preamble that by the present law the authors of paintings, drawings, and photographs have no copyright in their works. Here it is to be observed that, prior to this, whatever may have been formerly thought or written in support of a copyright in such works of art, they were wholly unprotected. Observe further, that sculpture is not included in the statute. This has been the subject of complaint in some quarters, but without any real foundation; for, in the year 1814, an Act was passed whereby the right in such subjects is vested in the person who makes them, or causes them to be made, for the term of fourteen years from the time of first publication, provided that the proprietor's name, before publication, with the date, be put on such original sculpture.

The works included within the statute are every original painting, drawing, and photograph made either in the British dominions or elsewhere, and which shall not have been sold or disposed of before the commencement of the Act. It is first to be observed that the work must be *original*. It will be apparent to all that many productions of art present no more difficulty in this question than mechanical inventions, such as the steam engine or the spinning jenny. The paintings of the great masters in every country—though the authors may have borrowed the subject from a source other than their own minds—are at once seen to be perfectly original in every sense of the term. Several great Italian masters, for instance, have treated each in his own way the subject of *The Last Supper of Our Lord*. Yet each painting will be admitted to be a great work of genius executed separately and independently to which no one would refuse the title of originality. The law, then, in this matter does not require that the subject of a painting or a photograph should be new and unattempted by any prior artist. There may be a valid copyright even though the subject be common to every labourer in the field. What the law will regard in this respect is, whether the artist or photographer has produced anything which is the result of his own labour, and has therein exercised selection, combination, and arrangement, so as to produce something which no one else has produced before him. Under this principle it is clear that copies could never be entitled to any right; and not merely copies of complete pictures and photographs, but even copies of *parts* of these. A copy might be made of one of the figures of a great historical painting, the rest being omitted. In this there is nothing of the copyist's own except the slavish labour of imitation, and the statute justly refuses any merit to such a worker as entitles him to protection. In photography this principle will possibly give rise to many nice and difficult questions. These are not questions of law, but of fact, which will depend, in every instance, on the verdict of a jury. The honest photographer, however, will have no difficulty in steering clear of such questions. In his art he has only to execute a scene or object for himself and he may obtain all the benefits of the statute; for it expressly reserves the right of any person "to represent any scene or object, notwithstanding that there may be copyright in some representation of such scene or object." Two photographers may, for instance, separately and independently, betake themselves, at the same moment, to photograph the same object in nature, under the same conditions of sky and atmospheric light, from nearly the same point of view, with the same materials, the same kind of camera, and the same process, and produce two representations of the object nearly resembling each other, each of which will be entitled to originality and to the protection of the statute.

It must not be forgotten that the painting or photograph may be executed in any part of the world's surface, and yet take benefit from the statute. The photographer may photograph the Polar regions at great labour and expense, return home, and put himself and his works under its protection.

Another and important point to remember here is that the subject painted or photographed shall not have been sold or disposed of before the commencement of the Act. If the work has been executed and gain made of it before the 29th July, 1862—when the royal assent was given to it—no copyright can be validly obtained for such work. But if the work has been executed prior to that date, and retained in the author's studio, within his own power and under his own control, and if subsequently to the Act he desire to sell the painting or photograph, this may be validly done and yet the privileges of the statute be secured. It is even conceived that the painting or photograph may be exhibited publicly, where the eyes of all visitors might inspect it, without losing the right; for the work must have been sold or disposed of before the commencement of the Act.

We now proceed to mention the persons entitled to the protection of the statute. The first great class of persons whom the statute notices are the authors of the subject protected, and the sole condition to their acquisition of this valuable right is that they shall be British subjects or resident within the dominions of the crown. What constitutes residence in the sense here contemplated? Do the words mean that the person applying for the benefit of the statute shall have come here to reside permanently, and shall have acquired a domicile in this country? Or do they mean that the person may come to reside here for no other purpose than to acquire the copyright of some work? May an alien foreigner execute a photograph abroad, print off thousands of copies, and, bringing them along with him, after a short residence acquire the privileges of the statute? I do not pretend to solve these questions. I will only say that the general scope of the statute is to encourage native art, and art executed by British subjects. On the other hand it is not immaterial that under the statute the work may have been done either in the British dominions *or elsewhere*.

The second class are assignees or purchasers from the author of the work so executed, provided that they, by an agreement in writing at the time of the sale, signed by the persons selling or disposing, acquire the right which the author himself might have been entitled to under the statute. The clause further declares that when any painting or drawing, or the negative of any photograph, shall, for the first time after the passing of the Act, be sold or disposed of, the person so selling or disposing of the work shall not retain the copyright of it, unless it be expressly reserved to him in a writing signed at the time of the sale. Part of the first section of the statute is obscurely worded, and it were much to be wished that the Act was clearer and less open to questions on the ground of ambiguity. It appears, however, that in all cases the author and purchaser must determine with whom the copyright will remain by a signed agreement under the hands of both parties, at or before the date of the sale.

Another class of persons to whom the benefits of the statute are extended are the employers on whose behalf a painting or negative of any photograph shall be made or executed for a consideration—in short, the statute gives the right to the party who orders a work. It appears to me that in this latter case the copyright is vested in the employer, without any necessity for an agreement with the artist or photographer. If, on the other hand, the latter wishes to retain the copyright of the work, he must stipulate for that in writing with his employer. The requirements of the statute on this point I distinguish from the requirements of the statute in the former case. I venture on this opinion, however, with diffidence; for the wording of the statute is intricate and involved, and the difficulty arises from there being two relative sentences, the one as to the rights of the person selling or disposing of the work, and the other as to the rights of the purchaser or assignee. The terms employed in the one sentence are not so broad and comprehensive as those employed in the other, and hence the difficulty of construction.

By another clause of the statute it is declared that all copyright under the Act shall be deemed moveable or personal estate, and shall be assignable at law. Under this clause the executor of a deceased author, or trustee in bankruptcy, or husband of a female executing a work, or other person to whom the copyright may have been conveyed by testament or operation of law, will be entitled to take benefit under the statute.

Now, the right given to all these parties is the sole and exclusive right of "copying, engraving, reproducing, and multiplying the painting or drawing or design thereof, or the photograph or the negative thereof, by any means or of any size." These words of the statute are very comprehensive, and give very extensive rights. It is of importance to observe that the design is protected as well as the painting itself, so that the painter who produces some new design as an accessory of his subject would be entitled to prevent the use of that in the arts. This is a very strong right to confer, the propriety of which may be questioned. To the photographer it is apparent that the right thus conferred will be of the utmost value. The piracy which was so frequent will be destroyed, and, as will be afterwards seen, the party entitled to the benefit of the statute may proceed to vindicate his right by law. Yet the ease and facility with which copies are made and multiplied by the photographic art will render the law very difficult to enforce. The very nicety, too, with which the spurious copy can be made to resemble the true one affords a facility for piracy and a power of evading detection. Some have even maintained that it will be impossible to establish any copyright in photographs, and the difficulty which would be encountered in this matter was used as an argument against establishing such a right, while the Bill was passing through Parliament. I believe, however, that, notwithstanding this difficulty, photographers of all classes—and especially those whom it is politic to encourage—will derive great benefit from it. I refer to those who will be encouraged to attempt important and difficult works, or to make improvements in the art, and to introduce new processes. I believe the protection

given to the labours of such men will stimulate and encourage the art, and gradually foster throughout all classes of photographers a desire for the production of something new and original, and a higher respect for their profession than they would otherwise have. It may be that in a few departments the trade in photographs will be restricted; but, as a system of registration is established, to entitle to the benefits of the Act, it is believed that the general photographer will not be much affected.

Registration of the work is essential to the validity of the copyright. This is one of the most important of the provisions of the statute, and it will be remembered that the Bill was originally introduced into Parliament without any of the registering sections. It would undoubtedly have been a great blemish in the Act if these clauses had not been added, the want of which would have made it scarcely capable of being enforced. Happily, however, the representations of some patrons of art prevailed; and the Act directs that there shall be kept, at the Hall of the Stationers' Company, in London, by the officer appointed for the purpose of registering books and other literary property, a "Register of proprietors of copyright in paintings, drawings, and photographs." In this is to be entered a memorandum of every copyright established under the Act, and also of every subsequent assignment of such copyright. The memorandum is to contain a statement of certain particulars—and among others the name and place of abode of the person in whom such copyright is vested, and the name and place of abode of the author of the work; together with a short description of the nature and subject of such work, and, if so desired, a sketch, outline, or photograph of it. Practically these requirements must be carefully attended to, to entitle to the benefit of the Act; for the right is given, subject to the performance of the condition of registration. The trouble attending this will not be great, for I have no doubt that forms of registration to be filled up will be easily obtained from the officer above mentioned. Personal attendance does not seem necessary, and the fee exacted for making any entry required by the Act is one shilling only.

The register is also open for inspection on payment of one shilling. A certificate from the officer is declared receivable in evidence in all courts and in all summary proceedings, and to be *primâ facie* proof of the proprietorship or assignment of the copyright.

The duration of the right thus conferred is for the lifetime of the author, and seven years after his death. This limit is different from that of other copyrights; and it is to be regretted that so many acts encumber the statute-book, which give various limits to the right which they confer.

Having considered the nature and duration of this species of property, I now proceed to mention the mode in which the infringement of the copyright may be made and the penalties imposed.

The object of these sections is to give to the proprietor of the copyright the exclusive privilege of taking all the profits out of the work which it can in any form produce; and they prevent the copying, imitating, or otherwise multiplying, or the importation from abroad for sale, hire, exhibition, or distribution, any work or the design of it, under a penalty of £10, with forfeiture of all the copies or imitations made. On this part of the subject it may be noticed that the question of intention does not appear to enter into the determination of the question of piracy. It is the fact, not the intention, which will regulate the law in this matter. The proof of the piracy will be comparison of the two works; and our courts, among other proofs of piracy, have been in the habit of relying upon the occurrence of the same inaccuracies in the two works. In one case the great Lord Eldon observed that from the identity of the inaccuracies it was impossible to deny that the one was copied from the other *verbatim et literatim*. So it will frequently happen that the piracy of a photograph may be detected by the recurrence of the same flaw in the registered and spurious work.

While discussing these violations of copyright we must not forget that the statute goes much farther than we have yet stated, and appears to inflict penalties upon fraudulent productions and sales, whether there be copyright or not in the work. Thus no person is fraudulently to sign any name, initials, or monogram upon any painting, drawing, or photograph, or sell any painting, drawing, or photograph, having thereon the name, initials, or monogram of a person who did not execute the work; or utter any copy of any photograph as having been made by the author of the original work from which the copy was taken; or alter any work and sell the same as the unaltered work of the author of any photograph made either before or after the passing of the Act, provided the person whose name has been signed or work altered shall have been living within twenty years of the time when the offence was committed. Heavy penalties are imposed for the infringement of these provisions. It is clear from this that the statute cuts very deeply, and that it is a total mistake to represent it as merely giving copyright to some works. It also attacks all fraudulent interfering with the property of others, and provides remedies against such fraud.

The judicial proceedings by which the copyright may be protected or made good are by summary application by the way of injunction, or by an action for forfeiture, penalties, and damages. Into this part of the matter I do not enter, but merely call attention to the provision that no action shall be sustainable or any penalty recoverable unless the work has been entered in the register-book at Stationers' Hall.

I do not pretend to have exhausted the provisions of this statute; but have given the leading features of it, so that my hearers may understand the nature of enactments in which they are so much interested.

I cannot conclude without remarking that the statute does not appear to interfere with the private labours of any individual or the present position of the photographer, provided he be content to run the risk of the loss of the monopoly which the statute confers.

It may interest many to know what is the position of photographs, not intended for publication, under the law. I answer, that they seem to me to be in the same position as the manuscript of an author intended, but not yet authorised, to be published. Such a manuscript may be given out extensively for perusal; but if no authority be given to publish, the common law will protect the author in his rights of property, as well as his reputation. No man has a right to give another's works to the world, or to propagate them beyond the point to which consent has been given. The author is the sole arbiter to restrict or warrant circulation.

I have thus endeavoured—I feel very imperfectly—to state shortly the leading principles which the recent statute has brought into force, with the view of assisting you in the regulation of your conduct, of informing you of your rights, and in the hope of stimulating you to the exercise of them. Permit me, in conclusion, to apologise for the numerous imperfections and slight character of this paper, and to express a hope that the discussion to which it will give rise may compensate for its defects.

Meetings of Societies.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

The first meeting of the above Society for the session 1862-3 took place on the evening of Thursday, the 9th instant, at the City of London College, late Sussex Hall, Leadenhall Street. The Rev. F. F. Statham, B.A., F.G.S., &c., President, occupied the chair.

The President, in the absence of any formal report by the Secretary in reference to the out-door meetings which had taken place during the recess, observed that they had taken place on the days advertised at the last meeting of the Society, and that the one at Charlton was especially successful. Some specimens of landscapes and groups of figures taken on that occasion were brought by the Secretary for exhibition that evening. He (the President) regretted that there were so few members present, and thought it partly attributable to the absence of any announcement of the meeting in the recent numbers of the journals. He had much pleasure in directing attention to an album containing some *carte-de-visite* portraits and vignettes, plain and coloured, by Mr. Carbutt, of Chicago, an American photographer, who favoured the meeting with his presence that evening. Mr. Martin, too, had presented to the Society's portfolio some dozen photographs of the size called panoramic (7¼ by 4½), illustrative of a tour made in North Wales and the neighbourhood of Liverpool. He (the President) thought Mr. Martin's example might be judiciously followed by other gentlemen who had made holiday tours with their cameras, as the Society would thus become possessed of an annual picture record of the proceedings of its members. He then asked Mr. Leake to read his paper *On Photographic "Whimseys."* [See page 383.]

At the conclusion of the paper the President proposed a vote of thanks to Mr. Leake, which was unanimously accorded.

The President observed that while Mr. Leake expressed an opinion that there were many present who would differ from him *in toto*, there was at least one point upon which they would all agree among themselves, and that was in reference to the care and pains which Mr. Leake had exercised in the preparation of his paper. He (the President) thought it very important that members should jot down their experience, and bring their notes forward for the benefit of their brethren of the camera. He was not sufficiently conversant with the practical details of the matters noticed by Mr. Leake to appreciate to the fullest extent the very able manner in which he was sure they had been treated, and would therefore call on some gentleman more competent to open the discussion.

The Secretary thought Mr. Leake's views as to the variation of the colour in negatives were hardly correct. He (the Secretary) had obtained results similar to those spoken of and exhibited by Mr. Leake, only through a difference of exposure, all the other circumstances having been equal. He thought the bath more suited for iron development when neutralised with oxide of silver and acidified with nitric acid, than when carbonate of soda and acetic acid were used successively.

Mr. Simpson thought it was generally admitted that such applications to the bath as had then been spoken of were only necessary when the nitrate of silver was defective. If that salt were used in the pure state a good bath was always obtainable: if, however, organic matter were present it might be advantageously removed by the addition of carbonate of soda, when the carbonate of silver thus produced carried down this impurity much on the same principle as albumen in the fining of wines. In reference to Mr. Leake's remarks as to the use of albumenised paper for large prints, he thought the objection might be removed by adopting the resinised paper introduced by Mr. Cooper.

The Secretary had heard that that paper was open to the objection of yellowness in the whites.

Mr. Simpson replied that the benzoin paper had been found to turn yellow; but that some papers subsequently prepared with frankincense and mastic had retained the purity of their whites.

Mr. Wall regretted he had not brought with him a large solar camera picture taken on the paper in question, which he thought would prove very useful in that direction.

Mr. Simpson observed, in extenuation of some objections raised to the process, that it was yet in its infancy; and, moreover, that he believed all gums had a tendency to turn yellow.

Mr. Price thought that difficulty might be overcome by carefully selecting the gums of the first and second gathering.

The Secretary believed it had at least this one advantage, that the paper was much stronger, and consequently not so likely to tear in the washing and toning processes.

Mr. Howard thought there were one or two observations in Mr. Leake's paper which ought not to go forth to the world unchallenged. First, in reference to patent plate, he must say his own experience did not accord with Mr. Leake's, since he had taken very good negatives of various sizes up to 5 by 4 on the best crown glass, and he thought that if amateurs followed Mr. Leake's suggestion they would be putting themselves to a great deal of unnecessary expense. With reference to the suggestion to add a little of the iodiser of the collodion to the bath, he would observe that that was not always convenient, as in cases where collodion was purchased from large makers those matters were generally kept secret. His (Mr. Howard's) plan was to dissolve one ounce of nitrate of silver in twelve ounces of water, and add one grain of iodide of potassium, agitate occasionally during half-an-hour, filter, and the bath was ready for use. Another point referred to was the sensitising of the paper, and in that connexion he would say he had found a great saving of the silver solution might be effected by withdrawing the paper *very slowly*, so that no more solution was found to adhere than was sufficient to form two drops.

Mr. Wall thought that the want of harmony between the opinions of professional and amateur photographers on the subjects then under discussion could not but prove very perplexing to beginners, who looked to men of experience for guidance. He had last week lost five guineas through taking negatives on common glass: so far, therefore, from advocating its use, he desired distinctly to endorse all that Mr. Leake had said in favour of patent plate.

The Secretary was of opinion that the quality of the glass was not so important as having the two sides perfectly parallel to each other, so that there should be an equal bearing in the pressure-frame.

Mr. Fitch had taken whole-plate negatives on common glass, and had no negatives broken: that might probably be attributable to his method of printing without plate-glass to his pressure-frames.

Mr. Simpson believed that a certain per-centage of breakage was always allowed for in all large establishments, and he heard an employer recommend a printer by saying that not more than half-a-dozen negatives were broken by him in twelve months.

Mr. Foxlee thought the deposit spoken of by Mr. Leake as occurring with some kinds of glass arose from the smoke condensed on its surface in the process of manufacture. He had found tripoli and water remove it; but thought polished flatted crown best for amateurs.

The discussion on this point becoming somewhat conversational, the President asked the opinion of members as to the advisability of printing in the shade.

The Secretary very clearly and succinctly stated that a strong negative should be printed in the sun, and a weak negative in the shade.

Mr. Wall thought that it must be a *very* strong negative that required printing in direct sunlight; and he was induced to advocate printing in the shade by three experiments which he had performed on the same negative. He had taken from it one print in the *sun*, one in the *shade, open air*, and the other inside *in his glass-room*: the third, printed in the deepest shade, was unquestionably the best picture.

Mr. Simpson thought the increase of detail produced in shade-printed pictures attributable to the slower reduction of silver.

The President asked if temperature had anything to do with the result?

Mr. Leake thought it had not.

Mr. Martin was of opinion that analogy in other chemical operations would lead to the conclusion that temperature exercised an important influence, since chemical re-actions were found almost invariably to proceed with greater activity at slightly elevated temperatures, and there could not be much question about the elevation of temperature when a pressure-frame was exposed to the direct rays of the sun.

Mr. Price's experience corroborated the opinion expressed by Mr. Martin. He would, however, remind the meeting that Mr. Snelling had proved that those pictures which were printed in the sun were the first to fade; and the fact was explained by comparing the prints to a burnt-up rump-steak, having only a superficial and thin outer coating of reduced silver, which soon yielded to any adverse influence.

An animated discussion then ensued on the subject of "mealiness," in which a number of most conflicting opinions were elicited, aptly illustrating a remark made by Mr. Wall to the effect that no doctors ever disagreed so much on matters within their province as photographers did on this vexed subject.

Mr. Leake having replied to and cleared up one or two misconceptions of his meaning on the subjects of glass, toning, bath, &c.,

Mr. Wall gave it as his opinion that the Society should occasionally recognise services done to photography through other channels than its own meetings. He would therefore propose a vote of thanks to Mr. Cooper, Jun., for his account of researches on resinised paper, recorded in the *Photographic News*.

The vote of thanks was unanimously passed.

Mr. Simpson exhibited a panoramic picture by Mr. Sutton, of Jersey, as a specimen of a rapid dry process which he had recently discovered. The exposure was no longer than with a wet plate, and the picture was by no means deficient in detail, even in the deep shadows.

Mr. Howard proposed that a special meeting should be convened for the purpose of deciding as to the method of winding up the Crystal Palace Exhibition.

The meeting was then adjourned. The next meeting is to take place on the 13th of November.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held at the Rooms of the Literary and Philosophical Society, George Street, on Wednesday evening, the 8th instant,—Professor W. C. Williamson, F.R.S., in the chair.

The Chairman stated that Mr. Mabley, the Honorary Secretary of the Society, was out of town, and that Mr. Mann had been deputed to take his place for the evening.

Mr. C. A. Duval was unanimously elected a member of the Society.

The following gentlemen were elected the officers for the ensuing year:—

President.—The Right Rev. The Lord Bishop of Manchester.

Vice-Presidents.—J. B. Dancer; J. P. Joule, LL.D., F.R.S.; John Parry; Joseph Sidebotham; Professor W. C. Williamson, F.R.S.; and Professor H. E. Roscoe, Ph.D.

Council.—John H. Gilbert; Thomas Haywood; William Hooper; W. T. Mabley; Edward Mann; L. J. Montifiore; James Mudd; T. H. Nevill; Michael Noton; Andrew Patterson; H. Petschler; John Rogerson; Henry Thorp; J. C. Töbler; George Wardley; Hindle Young.

Treasurer.—Edwin Offer.

The election of the Secretary was adjourned to the next meeting, as there were some doubts expressed as to whether Mr. Mabley, the present Honorary Secretary, who was absent in London, would consent to continue to act.

Mr. Mann then read the Treasurer's account for the past year, showing a balance in hand of £52 13s. 3d.

It was moved, seconded, and carried unanimously, "That the sum of £5 be handed over by the Treasurer of this Society to the Council of the Literary and Philosophical Society, as a contribution towards the late expenses incurred in beautifying the rooms, and that the best thanks of this Society be tendered for the use of the rooms."

A resolution was also unanimously carried that the meetings of the Society be held for the future at half-past six o'clock, and that the members be provided with tea, and that any member be at liberty to introduce a friend to tea on the meeting nights, on payment to the Treasurer of a small fixed amount.

The subject mentioned in the circular, viz., as to whether a rule should be framed having for its object the exclusion of subjects involving trade interests, was introduced by Mr. Sidebotham; and, after a lengthy discussion among the members, it was ultimately suggested by the Chairman that, as he understood it was intended to revise the rules, the subject should be disposed of when the new rules were framed.

It was then resolved that Mr. Sidebotham, Mr. Parry, Mr. Mabley, and Mr. Mann be appointed a Committee to draw up the proposed code of new rules.

A resolution was passed that Mr. Sidebotham be authorised to purchase a suitable album for the reception of *carte-de-visite* portraits of the members.

It was then resolved that the meeting be adjourned to the first Wednesday in November, for the report to be prepared, the election of a Secretary, and other business.

After a vote of thanks to the Chairman the proceedings closed.

GLASGOW PHOTOGRAPHIC INSTITUTION.

The ordinary meeting of the Glasgow Photographic Institution was held in the Rooms, 75, St. George's Place, on Thursday, the 2nd inst.,—John Kibble, Esq., President, in the chair.

In the absence of the Hon. Secretary, Mr. E. Brace, Mr. J. Ewing read the minutes of the previous meeting, which were approved of. Six gentlemen were then ballotted for as members of the Institution.

Mr. Crombie then read the following paper—

On the Rise and Progress of Photography in New Zealand.

At the request of the Hon. Secretary I have been induced to offer a few remarks *On the History and Progress of Photography in New Zealand*

In 1841 the first European settlement was established in Auckland, the most northern province of New Zealand. The necessaries of life being the most important to a young colony, several years elapse before anything of a pictorial nature comes on the scene.

Notwithstanding the comparative youth of photography, and in that remote region, so far back as 1849 or 1850 a gentleman was then travelling professionally as a Daguerreotype operator. He was shortly afterwards followed by another, who also paid a flying visit to the different provinces.

In the early part of 1851 a gentleman, who, with his family, emigrated to Auckland, had taken the precaution to add the Daguerreotype process as another "string to his bow." He shortly after gave up all other pur-

suits, and followed it as a profession. He was, I believe, the first in that part of the world to introduce the calotype process.

With respect to the spread of photography in New Zealand, I may state that, when I arrived in Auckland from Melbourne, in 1855, there had been at least three operators before me in that small town of about 3,000 inhabitants. A twelvemonth later, when travelling through the towns of the southern provinces, I found that several had preceded me on the same errand, and, from all accounts, had finished the business. That, however, I found not to be the case so far as I was concerned, having always as much professional occupation as I could attend to.

According to the census taken in December last, the population of Auckland and suburbs was about 10,000. The photographic wants of this population are ministered to by six professional photographers, besides others who practise the art occasionally. The other towns, in proportion to their population, are equally well supplied with operators. It will thus be seen that we have no lack of aspirants after photographic fame.

The results are, however, I am sorry to say, very far from being satisfactory, when compared with those of this and other towns in Great Britain. This may be accounted for in many ways. The islands of New Zealand have been, till very lately, without the conveniences of steam communication. The towns being thinly populated and widely scattered, an operator is very apt to become either stationary or to lag behind in the march of photographic advancement. The extended nature of the settlements and scattered population doing away with that pressure from without which is so palpable in large towns and densely-peopled countries, there is not the same incentive to excel that there is in large communities, where competition is always in excess. But, perhaps, the greatest drawback to the photographic student is—as was observed by a member at last meeting—to be found in the petty jealousies that are ever associated with small communities. In large cities like Glasgow, and in societies such as I am now addressing, the searcher after knowledge has an opportunity of propounding his theories and submitting his experiments to others equally interested with himself in the perfection of the most subtle and beautiful science of modern times.

The progress of photography in New Zealand, it may be taken for granted, is in the same ratio of advancement with other sciences at a distance from their source—rather slow and feeble in its results.

We commenced with the Daguerreotype early in 1847, and adhered to it pertinaceously up to 1857, when we got to glass positives, which we eagerly held on by till the interchange of photographs between friends in England and friends in the colony called for something of a more portable nature. We were thus forced into the paper process.

It must be remembered that, in those distant parts, where everything has to be done by one pair of hands, and from the want of that incentive to excel already referred to, we are rather slow to get out of the beaten track. However, to paper "we have come at last," several specimens of which I had the privilege of submitting to the members at the last meeting, and which you were kind enough to notice in a manner more flattering, I am afraid, than they deserved.

I now beg to submit to you a street view, taken as nearly instantaneously as the circumstances of my case will admit. This brings me to the subject of exposure in the camera,—a question that has excited considerable speculation with several gentlemen to whom I have mentioned the subject.

Whether it be from the nature of *our* light, the superiority of *your* lenses and chemicals, or defective manipulation on our part, I must leave you to judge, but I confess I have rarely got a good dense negative under from twenty to thirty seconds in the operating-room; and outside, with a Voigtlander 3¼ lens and half-inch diaphragm, I have required from five to fifteen seconds for views.

My sensitising bath is acid, and has never been boiled. I develop with iron till the shadows appear faintly; wash the plate; intensify by adding a few drops of the silver bath to the iron developer; wash off, and fix with cyanide.

My sensitising bath is composed of forty grains of silver and about one-quarter grain of iodide of potassium to the ounce of rain water, caught direct from the clouds.

The developing solution is twenty-four grains of protosulphate of iron, with the same proportion of acetic acid and alcohol to the ounce of water.

Perhaps the difference of time required in New Zealand and here may induce some of the members present to instruct us on a subject that must be interesting to all concerned.

In conclusion permit me to acknowledge the kind and friendly manner in which I have been received by all the members of the profession. The time and trouble they have taken to enlighten me on many subjects have placed me under obligations that I am afraid I shall never be able to repay.

In the course of an interesting discussion which followed the reading of the paper,

Mr. Alexander Macnab remarked that he had much pleasure in listening to the paper just read by Mr. Crombie, as in it that gentleman had touched upon many points of interest to the profession—one in particular, viz., the light with which they worked. He was not astonished at the surprise manifested by Mr. Crombie in finding that with an apparently duller light photographers in this country were able to produce pictures with greater rapidity and seemingly more density than their brethren at the Antipodes, who worked in a much clearer atmosphere. He did not believe that the difference was attributable to the greater purity of the chemicals or more rapid action of the lenses, but entirely to the difference of climate; as, although their light had greater illumination, it must really possess less actinic power, as it was not always the brightest day which gave the best results. Even in their observation of the differing aspects of light in their island-home, they often found on a lovely day in June, with a bright blue sky overhead, the actinic action was decidedly slower than on a duller day with perhaps more clouds above. Much depended on the state of the atmosphere, and the quarter from whence the wind blew. He had observed that more particularly in the country, where the smoke and dust of the city could have no influence in the matter. Another point of importance was the careful manipulation of the plate; as, in the case of different iodides in the collodion, much depended on the time allowed for the coating of the plate on its immersion in the bath—the time that should elapse before exposure and development. He thought on the proper understanding of that point much of the real perfection of the resulting picture depended, as he had often found that a plate just inserted in the bath till the etheral and alcoholic streaks had barely subsided, placed rapidly in the dark slide, and exposed and developed in the same hurried manner, gave hard pictures, much wanting in those softer gradations of tone observable in a picture the collodion of which had been allowed to get thoroughly saturated with silver, and just exposed at that moment when it was in the best condition to receive the reducing element, light.

Mr. Ewing observed that he could not understand why Mr. Crombie used such an extraordinary quantity of iron in his developer, as it was quite unusual in this country to use such a powerful solution. It also appeared that his silver bath was much stronger than that used for wet collodion plates.

Mr. Stuart seemed to have used the iron developer quite as strong on many occasions.

Mr. Macnab was of opinion that better results were obtained from a weaker solution of iron, say from twelve to fifteen grains to the ounce. He thought that by using a weaker solution a more evenly developed and more intense plate was obtained.

Mr. Long remarked that he had frequently been annoyed with a halo surrounding the extreme edges of objects in his pictures, as where trees rose into the sky of a landscape, or around a portrait figure when a white background was used.

Mr. Macnab supposed that such halo light was occasioned by the developer passing over the darker portions of the plate without being taken up, and arriving at the strong contrasting light of the background threw down a stronger precipitate around the edge, gradually softening as it passed over the plate. In regard to the same being observed of trees, he thought Mr. Kibble had some time ago attributed it to a phosphorescent or vapoury cause.

Mr. Kibble.—To a gaseous cause.

Mr. Stuart remarked, on the subject of light, that he found in working outside in the shade on a bright day that the prints required a longer exposure than on a dull day. He had heard Mr. Macnab remark that on a foggy day, looking out of his window into the street, the houses could scarcely be seen; but looking from his glass-house, which was blue, the light was comparatively clearer, and the houses which were dim before became more visible. Now, he (Mr. Stuart) considered that such glass-houses were very apt to cause blunders in the proper exposure of the plate, as on entering his glass-house, which was not blue, he could tell to within a few seconds the amount of exposure a plate required.

Mr. Ralston observed that, by a judicious arrangement of blue cloth screens, any desiderata of colour in a glass-house could be met.

Mr. Kibble then read his promised paper *On Instantaneous Photography.* [See page 379.]

Much interest was evinced by the members throughout the reading of the paper, and on the results being produced and handed round Mr. Kibble received the warm approbation of the Society.

The Chairman then drew the attention of the members to some beautifully-executed Woodward's solar-camera enlarged prints, exhibited by Mr. John Stuart, stating at the same time that that gentleman was open to answer any questions relating to the manipulation of the specimens then before them.

Mr. Macnab highly complimented Mr. Stuart on his successful execution of those pictures "untouched," and thought it no flattery on his part to give that gentleman his unqualified meed of praise; but the advanced time of the evening would prevent the members from fully entering on the subject with that interest which he was certain the pictures demanded. He concluded his remarks by expressing a wish (and, in doing so, he had no doubt it was shared by all present) that Mr. Stuart would kindly allow them to be brought to the rooms the next evening of meeting, when, perhaps, he would be able to give them something in the shape of a paper.

To this Mr. Stuart assented.

Mr. Long suggested that, as Mr. Stuart had already been at considerable expense in getting those pictures forward for their inspection, any further expense incurred be defrayed from the funds of the Institution.

The suggestion was at once adopted.

Mr. Mactear exhibited a useful form of dark cell and a simple instantaneous shutter, but the lateness of the evening would not admit of their careful consideration; and it was arranged that these articles should again be exhibited at the next meeting.

Messrs. Crombie and Kibble received votes of thanks for their excellent papers, as also Mr. Stuart for his enlarged pictures.

Mr. Crombie was proposed as an honorary member by Mr. Macnab, and seconded by Mr. J. Stuart, and five other gentlemen were entered on the proposal roll.

After a brief desultory conversation by the members, the meeting separated.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The first meeting of the Society for the winter session was held on Wednesday, the 1st instant,—Mr. Marwick, the President, in the chair. The attendance of members on the occasion was large.

The PRESIDENT made a few observations on the subjects proposed to be discussed during the session then entered upon. He also alluded to the arrangements made by the Council for a renewal of the popular evenings in connexion with the Society.

Mr. Andrew Mure, Advocate, was then called upon to read his paper *On the Application to Photography of the recent Copyright Act.* [See page 390.]

At the close of the paper a hearty vote of thanks was accorded to Mr. Mure.

An interesting conversation followed the reading of the paper, which was kept up till a late hour, when it was agreed that the subject should be resumed that day fortnight.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

[The following arrived just as we were "going to press" with our last.—ED.]

A MEETING of the Council of this Association, for the admission of members and subscribers, was held on Friday, the 26th ult., at 26, Haymarket, —The Right Honourable the Viscount Ranelagh, Vice-President, in the chair.

The minutes of the last meeting having been read and confirmed, the following members and subscribers were proposed and duly elected:—

Admiral Kellett, C.B.	Major-General Osborne.
The Hon. and Rev. A. Campbell.	Robert Murray, Esq.
R. S. Newall, Esq.	A. W. Hume, Esq.
F. Ark, Esq.	Captain W. R. Houghton.
J. W. Weldon, Esq.	W. Drury, Esq.
Rev. R. Battiscombe.	Miss E. B. Huson.
Robert Hunt, Esq.	Thomas Pryce, Esq.
R. F. Holle, Esq.	Captain A. Hoskins.
B. Willis, Esq.	W. Allen, Esq.
W. F. Tollemache, Esq.	S. Mortimer, Esq.
G. Farquhar Smith, Esq.	T. Woods, Esq., M.D.
Captain J. G. Sandeman.	Thomas Halifax, Esq., M.D.
Benjamin Fagh, Esq.	Miss E. Gamlin.
W. J. C. Moens, Esq.	J. Vaughan, Esq.
F. H. N. Glossop, Esq.	The Commander of H.M.S. Algiers.
Lieut.-Col. C. Holder.	T. W. Pigott, Esq.
James Ferrier, Esq.	R. Staples, Esq.
Mrs. C. J. Osborne.	W. Sibbald, Esq.
W. H. Price, Esq.	C. J. Setts, Esq.
John Yates, Esq.	George Potts, Esq.
Charles Crookes, Esq.	J. W. Tillerton, Esq.
J. Proctor, Esq.	D. W. Hill, Esq.
T. J. Murray, Esq.	J. Moreton, Esq.
Hugh McBean, Esq.	A. Hall, Esq.
P. E. Currey, Esq.	F. W. Hasenclever, Esq.

The Honorary Secretary (Mr. A. J. Melhuish) then laid before the meeting some very fine Egyptian negatives, by Robert Murray, Esq., one of the newly-elected members, which were much admired. The negatives are by the calotype process, and almost rival in sharpness and half-tone the finest collodion plates. * The Honorary Secretary also exhibited some interesting copies of ferns, by C. S. Harris, Esq.

Several matters of detail relative to the method of supplying the Association prints to members and others having been arranged, the proceedings terminated.

A. J. MELHUISH, HON-SEC.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

THE next meeting will be held at Myddleton Hall, Islington, on the 22nd instant, upon which occasion a paper, by Mr. George Dawson, Vice-President, *On some of the Preventible Causes of the Fading of Photographs*, will be read.

FIRE AT M. SILVY'S.—On Sunday, the 28th ult., a fire, which was well nigh attended with most disastrous consequences to life and property, occurred at Bayswater. It broke out in M. Silvy's laboratory, on the ground floor, owing to the heat of the furnace flue, and soon extended to the roof. Assistance was promptly on the spot, and, owing to the great exertions made, the flames were prevented extending, but not before great damage was done. M. Silvy was not insured.

* It may be some encouragement to beginners to hear that Mr. Murray taught himself entirely by a shilling handbook sent out to him to Egypt, having never seen a negative taken by any one until after his return to this country.—A. J. M.

"THE TIMES" ON PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION.

IT is not often that the professors of our art rejoice in so powerful an advocate for a recognition of its just claims as the great leading organ of public opinion, *The Times*.

On the 4th instant an article of considerable length appeared, which want of space will not permit us to reproduce entire, but from which we cannot forbear quoting the following:—

"There is scarcely a class in the Exhibition which does not profess, with more or less of truth, to have its peculiar grievances and hardships. Not one, however, has such just grounds for complaint as the contributors to Class XIV (photography), and from none have fewer complaints and remonstrances been received. Not that photographers have been at all indifferent to the slights they have received, or the way in which their once superb collection has been treated. As a body they were among the first of the many whom the Commissioners unfortunately managed to offend, and their association, therefore, early withdrew from co-operating in bringing about an exhibition which they knew was not only to be located in a place where few would see it, but exposed to such influences as would destroy their chances of successful competition with their foreign brethren. We would venture to say that only a very small percentage of the visitors to the building ever found by their catalogues that there was such a thing as a photographic collection in the Exhibition, and of this small number only a smaller number still have been tempted to scale the weary flights of stairs which give access to the room where the photographs are almost hidden away. For the information of those who may wish to see the little that yet remains worth looking at in this collection, we may state that the room is built above the brick tower of the Cromwell Road entrance—a height very nearly equal to the roof of the nave itself. A worse place than this could not possibly be given to it. The glazed roof, for a long time left unscreened, made the heat here during the summer quite unbearable. The heat peeled the pictures off their mounts, cracked and warped their frames, and the glare of the sun's rays ruined the tints of some of the finest specimens exhibited. Add to this that the whole space given was inadequate to the requirements of the class, and that more than half even of this little had to be shared with the maps and school-books of the education class. It must give foreigners (if any ever penetrate up here) a curious notion of our ideas on education to find that great dolls and cases full of the commonest kinds of children's toys are thought more worthy of exhibition as educational objects than the artistic and beautiful results of one of the most important scientific and chemical discoveries of the age. It may possibly be due to this state of things that the collection is by no means divided or arranged with proper effect, and that the catalogue is therefore far from being as good an assistant as the purchaser has a right to expect. Photography in 1851 had no class of its own, and, in fact, was scarcely represented at all except by a few Daguerreotypes and Talbotypes, which, with their apparatus, were exhibited among philosophical instruments. The collodion process, to which is due the development which has taken place since, was then not known. In the present collection all the photographs, with very few exceptions, are by the collodion process, and include, of course, every variety of specimens of the art—large and small portraits, *cartes de visite*, landscape views (instantaneous and otherwise), towns and buildings, stereoscopes, and positive transparent pictures on glass. Contrary to what might have been expected only a small number of portraits are exhibited, and of these collections only three call for any remark, viz., those by Mayall, Williams, and Watkins.

After a generally good detailed criticism of the works exhibited —some few technical errors excepted—in which deserved commendation is bestowed upon Claudet, Eastham, Caldesi, Bedford, Rouch, Wilson, Stephen Thompson, the Amateur Photographic Association, the Earl of Caithness, Lady Jocelyn, Sir A. Macdonald, Sidebotham, Robinson, Mudd, Piper, J. Spode, Vernon Heath, Sir H. James, Paul Pretsch, the London Stereoscopic Company, Negretti and Zambra, and Breese, the article concludes as follows:—

"Even now, after all the ill-usage the collection has experienced from atmospheric influences, there is still more than enough left to show how well our photographers have maintained their reputation against all comers. Few, however, have visited it without feeling that they deserved better at the hands of the Exhibition authorities than having their works huddled away in such a remote and almost inaccessible corner of the building."

PHOTOGRAPHY AND THE AMERICAN WAR.—During no previous time in America has the art, in a business point of view, been in so prosperous a condition, and with the demand for pictures has come a decided improvement in the perfection of the prints. All seem to be working up to a more uniform standard of excellence. Card-pictures are still the most in demand, and many of them are ordered to be coloured, which is being now done in various ways, and a large number of secret processes for painting on albumenised paper are being offered to the trade for a consideration.

Scraps and Fragments.

PHOTOGRAPHIC PREMIUMS have produced the Commissioners of the International Exhibition £2,350.

PHOTOGRAPHY IN FRANCE.—All the regiments of the French army now include both photographers and telegraphists.

PHOTOGRAPHIC JOKE.—An album photograph, just published, gives the portraits of a pair of young donkeys in a field, with the following inscription below:—"Not the first who have stood for their *cart (e) s.*"

ANOTHER.—What piece of a photographer's apparatus is the most valuable in a portrait establishment?—The rolling-press, to be sure. Why?—Because however ugly the model may be its aid will invariably make the portrait flatter! The perpetrator of the above is most urgently requested to call at the nearest police station.

PHOTOGRAPHY AT ROME.—The Pope has ordered photographs to be taken of his 258 predecessors, from portraits both in the Vatican collections and the Papal mosaic manufactory. Petagna is the artist entrusted with this honourable task.—*Parthenon.*

THE BRITISH ASSOCIATION.—From the report of the Committee of Council to the General Committee we find that "a sum of £40 was placed at the disposal of the Kew Committee for the employment of the photo-heliometer; and a further sum of £150 for the purpose of obtaining a series of photographic pictures of the solar surface, with the co-operation of the Royal Society." The report of the Kew Committee will make known the results of these recommendations.

PHOTOGRAPHY AT ROME.—The police have been very busy lately with a crusade against photographs, and the studios of the Via Babuino have been weeded of every "counterfeit presentment" of a liberal politician or good Italian. Only papalini or heathen deities are to be seen now; and Apollo Belvidere and Francesco II., the Queen of Naples and the Dying Gladiator, share the windows with Pio Nono, Antonelli, and Chiavone, who, if he is like his photograph, is an ugly monster enough.—*Daily Telegraph.*

A NEW APPLICATION OF PHOTOGRAPHY.—A few days ago a man dropped down dead in the street while giving information to a policeman that a woman had robbed him of some money. There was reason to think he had come from Stourbridge, Worcestershire, but no further clue could be obtained. One of the jurors at the inquest suggested that a photograph should be taken of the deceased and sent down to Stourbridge. This was done, and the consequence was that a female from Lye, near Stourbridge, attended at the inquest, which was resumed yesterday, and identified the man as her brother.—*Standard.*

MRS. WINDHAM.—The *Daily Telegraph* denounces the London shopkeepers who have "showed themselves sufficiently wanting in decency and good taste to exhibit photographs of Mrs. Windham combing her hair, and with a seductive leer on her countenance, in the same frame with *cartes de visite* of English ladies of rank." This practice (a common one by-the-bye) is likely to injure photographers; as there are few ladies—whether by rank or otherwise—who would not hesitate to sit for portraits to be published if they felt sure of their exhibition in such very questionable society.

PHOTOGRAPHY AND THE MILITARY IN FRANCE.—Lord Ranelagh, in a recent speech, describing a review of the French troops, said:—"It seems that a photographer generally follows the manœuvres; so the Emperor stood to be photographed. He asked me to join him. He said, 'You come: you are a volunteer: come and be photographed by my side.' I need hardly say that I wished to do so; but, unfortunately, the horse I was riding had very much of the English spirit about him, and would not stand still, so I could not join him; but it was his wish that the Emperor of the French should stand side by side with your humble servant."

INSTANTANEOUS VIEWS.—I have now before me a print from a half-size plate, which Mr. H. T. Anthony sends as the result of an experiment. It shows the shady side of Broadway, and is sharp over its whole field. It is remarkable, however, in giving in the foreground a lady's features under a black veil in the shade. Its instantaneity is proved by boys running across the street, and all the evidence of a high wind in waving flags and the disturbance of ladies' skirts—all given quite sharp and full of detail. It is to be hoped that this sample print is an evidence that we are to have a new edition of *Life in Broadway*, and *On the Waters of New York Harbour*. The old negatives from which Messrs. E. and H. T. Anthony printed so many proofs are now quite worn out, and there are no really good instantaneous views for sale at the present time. Stereographs being once more in demand seem to call for a new lot of instantaneous slides.—*Coleman Sellers.*

MODIFICATION OF THE ACETATE OF SODA TONING BATH.—A saturated solution of chloride of lime, well filtered, is preserved in a glass-stoppered bottle. Also a solution of two ounces of acetate of soda and two ounces of common salt in ten ounces of water. This is labelled No. 2, while the chloride of lime is called No. 1. To prepare the bath—one ounce of No. 2 is poured into four ounces of water, and to this one grain of gold is added: it is now neutralised with bi-carbonate of soda and stood for a few minutes in bright light. Next, in the toning-dish, is mixed one-quarter ounce of No. 1 with ten ounces of water, and the gold mixture poured into it. The prints, previously well washed, are placed in the bath, and tone very rapidly, and fine blacks are obtained without any salty look.

A VISION FROM ASPROMONTE.—This is the title of a little imaginative subject just produced by that arch-priest of photographic fine art, O. G. Rejlander. It is in the *carte-de-visite* form, and so stands a better chance of popularity amongst the discriminating (!) portion of the public, which will not buy fine photographs unless they will go into "those pretty little albums" which it seems one of the great ends of its existence to fill. Garibaldi—represented by the artist himself, whose features are not unlike those of the General—a prisoner and wounded, seated on the ground supporting the body with the right hand, while the left one is pressed to the forehead, is supported by a kneeling female figure representing Hope, while hazily seen in the distance is a glimpse of Rome,—just visible enough to suggest the idea.

BEAUTIFUL EXPERIMENT WITH LIGHT.—We recently called attention to a new work, by Mr. Grove, *On the Correlation of Physical Forces*, in which he describes the following interesting and illustrative experiment:—"A prepared Daguerreotype plate is enclosed in a box filled with water, having a glass front with a shutter over it. Between this glass and the plate is a gridiron of silver wire: the plate is connected with one extremity of a galvanometer coil, and the gridiron of wire with one extremity of a Brequet's helix—an elegant instrument formed by a coil of two metals, the unequal expansion of which indicates slight changes of temperature—the other extremities of the galvanometer and helix are connected by a wire, and the needles brought to zero. As soon as a beam of either daylight or the oxyhydrogen light is, by raising the shutter, permitted to impinge upon the plate, the needles are deflected. Thus, light being the initiating force, we get *chemical action* on the plate, *electricity* circulating through the wires, *magnetism* in the coil, *heat* in the helix, and *motion* in the needles."

NEW PUBLICATIONS.—Mr. A. W. Bennett has in the press, as one of his series of photographic gift-books, an edition of Scott's *Lady of the Lake*, illustrated with photographs of the scenery described in the poem.—A small book entitled *Kaiser Maximilian's Album* is announced. This will contain photographs of the twenty-four celebrated pictures, in relief, from the monument of the Emperor Maximilian I. at Innsbruck.—Victor Hugo's *carte de visite* has also made its appearance in all the shop windows, of which—the photograph, not the windows—*The Illustrated London News* says:—"Those who were privileged to know the famous romancist fifteen years since—those who have seen him in the Palais Royal, at Paris—will be astonished and saddened to find the brisk-looking, black-haired, Spanish-looking man, with his flashing eye and mobile lip, transformed into a tranquil, venerable person, with flowing white locks and a long grizzled beard. *Quantum mutabus ab ille.* Victor—in his photograph at least—looks Anglicised, as though his long sojourn in the Channel Islands had infused a modified degree of the John Bull element into him."

THE FIRST APPLICATION OF PHOTOGRAPHY TO PORTRAITURE.—In the *London Saturday Journal*, for November, 1839, we stumbled over the following paragraph:—"Attempts have been making abroad to apply the Daguerreotype to portraits; and M. Jobard, of Brussels, has announced that such will be forthcoming in a few months, and have every requisite of portraiture." It might be interesting, as a feature in the history of photography, to ascertain if M. Jobard really was the first photographic portraitist. At the time the above announcement was made our readers may remember that lectures on the wonderful new art, with practical illustrations, were being delivered in London, by M. de St. Croix, at the Adelaide Gallery, and by Mr. Cooper, at the Polytechnic. But on the brightest day the exposure in the camera was shown by these gentlemen to be about twenty-five minutes, which, for the purposes of portraiture, was of course sadly too long. If M. Jobard, therefore, announced the application of this art to portraiture he must also have been, at the same time, in possession of some means whereby he could very materially shorten the exposure, and we ought to know something more about it.

Foreign Correspondence.

Paris, October 10th, 1862.

EIGHTEEN months ago I mentioned, both in the *Moniteur de la Photographie* and in THE BRITISH JOURNAL OF PHOTOGRAPHY, a new invention in photography, or rather a new application of it, called "photo-sculpture." I have just visited the studio that the inventor of the process, M. Villème, has had constructed at the "Rond Point" of the Arc de Triomphe. Your readers will doubtless remember that the method consisted in taking twenty-four profiles from the same model, and then reproducing them amplified with the aid of the pantagraph on the plastic substance. The dome-like glass gallery covers in a perfectly circular space, whose radius is equal to the distance at which the model must be placed, in order that its image may always be in the focus of the quarter-plate objectives which are employed. These lenses are inserted in the wall at equal distances from each other, and the small cameras are worked by the photographer's assistants, who are in the corridor surrounding the studio. In fact, after the twenty-four collodionised glasses have been placed in their frames, the boards which mask the inner orifice of the lens rise and fall at the same time by means of a system of pulleys and weights, so as to allow the light to act, and to arrest its action when sufficient. Thus the model does not pose longer than for a single image. The amplification is carried on in another room, and the pantagraph finishes the work.

This application of photography is really curious, and its results are very remarkable. There would be nothing at all astonishing in the public's taking a fancy to these little busts just as they did to the *carte-de-visite* portraits.

As I have been led to describe this new kind of studio, I shall perhaps do well—in the absence of photographic news, for we are still in full holiday time here—to introduce you to the establishments of some of our leading photographers. The interest I felt in visiting the English studios makes me think that your readers will not be displeased at a slight sketch of the outward physiognomy presented by Parisian photography.

The first for richness and elegance is the establishment of Disdéri, situated quite in the centre of the Boulevards des Italiens, and occupying the upper part of the house in which Robert Houdin, of prestidigital reputation, has his theatre. The fantastic bills, signs, and illustrations of the latter give to it a peculiar aspect which catches and fixes the attention. After mounting two flights of a staircase covered with carpets, flowers, and decorations, you come to a large room, at whose threshold a servant in full dress is awaiting you. This is the office, in which are eight or ten *employés* busily engaged in entering orders, receiving money, sorting pictures, &c. Thence you enter a spacious saloon of princely elegance and magnificence. The ceiling is adorned with an allegorical painting symbolising light. All round are medallions, pierglasses, friezes representing the attributes of photography, and portraits of inventors. Here and there are choice photographs which attract the eye, and especially portraits of natural size and full length, amplified by the process ceded to Disdéri by M. Wothly. Two other smaller saloons, with old oak furniture, and their walls covered with Cordova leather and polished-steel work, are on the same floor. Above you find one of the largest terraces in Paris, the dark room, a small sitting-room for ladies, and the other work-rooms. The printing of positives is carried on at the branch establishment in the Avenue de St. Cloud. Disdéri has two operators; but it is he himself who attends to the pose, and who develops the *cliché*. Disdéri always wears a black cloth blouse and trousers fastened round the waist by a leathern belt, and with that a white neckerchief. His closely-cut hair and his long beard give a very peculiar physiognomy, which has often been laid hold of by the caricaturists.

The establishment of Pierre Petit contrasts with the one I have just been speaking of. Situated in one of the most populous and encumbered *carrefours* of Paris, which is inhabited by a population of *artistes* and *lorettes*, access is obtained to it through a lobby which is lighted up with gas even in the daytime, and whose walls are covered with a crowd of portraits, in which bishops, men of letters, artists, actresses, and doctors figure side by side. A narrow staircase leads you up to a small entrance-room, which serves as an office; from that you pass on into a modest-looking sitting-room a few yards' square; then you go out, through a short narrow gallery, upon a somewhat fine and very airy terrace. The laboratories, the store-room for collections, the rooms for printing, painting, and retouching, are on the roof and in various little corners on different storeys. It would be difficult to find more pent-up premises and more unfavourable conditions for the establishment of a photographic portraitist, and yet nowhere is the crowd more numerous than here. From eight or nine in the morning till nightfall the objective does not cease its work. The number of *clichés* executed per day varies from seventy-five to one hundred. The receipts are colossal.

Like Disdéri, Pierre Petit attends to the pose, and develops each *cliché* himself: the collodionised glass is handed to him, and he does not leave it till the fixing. For cards he generally uses a camera with four objectives. He does not keep his models standing long, and most frequently he talks with them at the moment of beginning the operation. A thick suit of black hair falling in ringlets on his forehead, and a bushy beard, allow you to see but little of his face except two eyes of peculiarly southern vivacity. He is very short, and is always in motion. He has nothing remarkable in his costume except his plaited wristbands, which he pertinaciously keeps to in spite of contrary fashion. Pierre Petit has established branch houses in several of the principal cities of France, and has undertaken various interesting publications, among which is the Album of the French Episcopate. Pierre Petit, who could well afford himself horses and carriages, prefers buying broad lands in his native province; and I think he is right.

Another curious individuality is that of Nadar. At once a humourist in literature, a spirited caricaturist, and a clever photographer, he bears in his whole person the stamp of originality. His size is herculean, his hair and moustache of a light yellow hue, is dressed in a red flannel blouse, and altogether looks like a satanic apparition. Red, too, is his colour of predilection. His wall-hangings, woodwork, inscriptions, signature, and even the fillet-border round his pictures, are all in red. His glass-house is a veritable garden, with rock and cascade and numerous perennials. His saloon is furnished with oriental luxury, and crowded with costly objects and works of art. What gives special interest to this apartment are the numerous frames which cover its walls, and contain all Nadar's original caricatures with three pencils. All the contemporary celebrities are there, each with his characteristic feature in strong relief. There they are also in more sober photographic guise, so that you can judge on the spot of the artist's double talent.

Such, rough-sketched, are the three principal photographic portraitists of our metropolis. There are others whose reputation and merit claim for them a description; but I perceive that my letter has far outrun its usual bounds, and I am unwilling to take up too much of that space which is so well filled by others. If my sketches interest your readers I shall be able to complete the series on future occasions.

ERNEST LACAN.

Philadelphia, September 27th, 1862.

THE BRITISH JOURNAL OF PHOTOGRAPHY, for September 15th, is before me, with no letter in it from your correspondent. It is to be hoped that the long letter intended for that number has since come to hand.* Since my last letter was written we have passed through some exciting days, and as I can write of some of them from a photographic point of view, the incidents may interest your readers.

After the reverses the Federal troops met with before Richmond, and when the cry of "Washington is in danger!" once more startled us from our feeling of security, it was rumoured that the Confederate army was about to enter Maryland, and Governor Curtis, of Pennsylvania, called upon the state militia to hold itself in readiness. Then there was a great deal of enthusiasm at once manifested, and new companies were organised for home defence.

But one Friday morning the day broke with a deluge of rain—such rain as had never before been seen in these parts. The water seemed to descend in one unbroken sheet. While this torrent was pouring down the morning papers gave the Governor's proclamation calling all to arms. Men looked at each other as if not knowing what to do; but a few words were spoken, and amidst the dreadful war of the elements, came the call to arms. Then the fire of patriotism burst forth as it had never done before, and the night of that day saw twenty thousand Philadelphians ready to march. But while the troops were drilling the news of the great damage done by the rain spread from mouth to mouth, and the story was told of houses washed away with all their inmates—of people drowned as they walked in the streets—of the waterworks' reservoirs bursting, carrying destruction with their rushing waters. The storm had been short, but oh, how violent! and now on many a plate is preserved the photographic impressions of some of the ruined districts. But to the war. Photographers had been

* Our correspondent's communication, it will have been seen, has come to hand, and been made use of in our pages.

benefited by the war, and they were not behindhand in lending a helping hand. No trade, no profession held back, and photographers were no exception. The Governor called for fifty thousand men from the State, and seventy-five thousand came at his bidding. As the storm of rain quickly passed away, so the clouds soon cleared from our political horizon, and now those men who were so ready to fight for their homes are returning to their families, and it is from them I have gathered some items of photographic interest.

Mr. Hemple, photographer, was in the same artillery company with Moran, the artist. This Moran is brother to the photographer of the same name. It was some of Moran's views that Mr. T. E. Blackwell took with him to England with his reminiscences of America. Last summer this same Moran passed over the route of the Pennsylvania Central Railroad, and has added to his collection two large volumes of artistic sketches in the Alleghanies. These pictures are about four and a-half inches high, and three and a-half wide. They are taken on wet plates, and represent all kinds of subjects. In one he has pointed his camera at the setting sun, and given us clouds in air, and their reflection in the waters of a still lake. Some show us glimpses of far-off mountains and rugged foregrounds, while a great many are studies of foreground only, rocks, weeds, and fallen trunks. One gem is the American tulip tree, so perfect in every detail that the shape and structure of its broad leaves can be studied, while its rough but regular bark is given with a pre-Raphaelite distinctness. It is a picture to be lingered over, and does full justice to the pride of the American forest.

But talking of Moran has led me away from Hemple, who had an interesting story to tell. He says that Harrisburg, the capital of Pennsylvania, was so crowded that even the carriage-ways were filled up with the troops pouring in, and that every photographic gallery in the place was crowded to suffocation. Very few photographs on paper were made; but thousands of ambrotypes were carried away by the soldiers. He showed me a large pile of these, representing groups and single figures of soldiers of all grades. These have been given to him to copy and enlarge. His company was stationed near the Susquehanna River, and he would have been glad to have had his camera with him. He speaks of a river nearly a mile wide—its bed studded with rocks—the rocky bed seen through its limpid waters showing the strata of stone crossing the river almost as regularly as a pavement—and he spent his time speculating on the possibility of making the stereoscope tell the story of this river, and wondered if an instantaneous picture would show the fish, as he saw them glancing through the clear stream. He is at home now, hard at work—as are most of his companions in arms.

But from Delaware we learn that there has been a regiment detached to guard the Dupont Powder Mills, and the quartermaster of the regiment is a photographer, and has been taking some good views. This he could well do, for the Brandywine River, on which the works are, is one of the most romantic streams in America.

At its mouth is the thriving city of Wilmington, and there resides Mr. Elwood Garret, photographer, who is one of our most ardent experimenters with the solar camera. He has made a business of enlarging for many years, and claims to be one of the first who used the condenser and reflector. Your correspondent knows him as a very agreeable companion, and one ready to communicate all he knows. He is a son of the noted abolitionist, Thomas Garret, who is said to have aided more slaves to regain their liberty than any other one man in America. It was this Tommy Garrett (as he is universally called) who, having heard that a reward was offered in the South for his apprehension, said—"They don't offer enough: if they will double the reward I will go to them for the money!"

Could any of my readers have seen how engrossed all our people have been in war matters, they would not wonder that subjects of photographic interest were hard to find. Very many of our amateurs say they have no heart to work with their cameras while their whole souls are engrossed with the war.

The American Photographic Society met at the beginning of September, but no report of the proceedings has reached me save through the pages of the *American Journal of Photography*, ending with a promise "to be continued." There was some argument about dry plates, and T. E. Anthony's solidified milk process was discussed. Professor Seely remarked that perhaps the plates would develop quicker if the butter were taken from the milk.

Anthony sends for his September exchange to the club another of his milk plate views. It is from the upper part of the Central Park, New York, and shows the pallisades on the Hudson River in the extreme distance many miles away. It is very distinct in all the foreground, and the atmospheric effect of the middle and extreme distance is well given.

The exchanges for September have been much behindhand, and no wonder during such times of trouble. Those prints which have come to hand show a marked improvement. So far they have all been from dry plates—mostly tannin, except Mr. J. D. Sergeant's cat and horse: as he has made a speciality of the portraiture of the brute creation, the dry process is not for him. Some time ago he travelled to the prairies, taking with him some good dogs, and he hoped to bring home some photographic specimens of the prairie birds and animals; but he had very poor success, and, being one of those particular men who will not show any of his work unless it is in his estimation perfect, he counts the time as lost. I shall beg a copy of his cat *Sicel* and his horse *Old Whitey* for our kind editor, who I know will be pleased with them.

One of the best plans to find out what is doing among photographers is to call at the workshops of the camera and case makers. I called to-day at Mr. J. Peace's shop to inquire about a camera and dry-plate box on the Thompson plan for one of Harrison's new globe lenses, and there I found that Thompson himself was having a new one made for larger plates; and I dare say that the next exchange day will find some of the Club sending larger prints than those for the stereoscope.

These new lenses of Harrison's having a focus of two and a-half inches—that is, the ground glass when distant objects are in focus is two and a-half inches from the back lens—make a clear circle of light five and a-quarter inches in diameter. The perspective is wonderfully well preserved, as I have tried in many cases—as, for instance, in interiors, there is no curvature of right lines, and the projection of the lines shows the perspective to be perfect. Some idea may be formed of the wide angle included in the view when I state that, in a room sixteen feet square, the camera being placed as close in one corner of the room as possible, and directed diagonally across the room, one entire side—*i.e.*, fourteen feet—and two-thirds of the other side were given; and could the lens have been so placed as to be exactly in the corner nearly the whole of the two opposite sides would have been included in the five and a-quarter inches. The included visual angle is very nearly 90°. A large number of these new lenses are now in use, and all who have tried them are loud in their praise.

Pyrogallic acid is now selling by the manufacturer at $1·50 per ounce wholesale, and nitrate of silver is $1·08 net cash. Chloride of gold has gone up since the increase in the value of specie; but the other chemicals remain much the same as they have been for a year past.

The attempts, so far, to make paper suited to photographic purposes have failed. A number of samples submitted to me for experiment proved good for nothing; but the end is not yet, and there is no reason why we should import our paper and pay such high prices for it too. Only think of giving $60 per ream for albumenised paper, and $15 to $18 per ream for plain paper! But the end of my paper warns me to stop.—So I am, with due regard,

COLEMAN SELLERS.

Correspondence.

ACARI IN THE NITRATE BATH.

To the Editor.

Sir,—I enclose some of the *Acari* from my photographic room, which, if not exactly the same kind as those discovered by Dr. Maddox, I think you will find very closely resemble them.

I have again carefully read Dr. Maddox's article, but cannot find that he says he found them alive. The only part of his article which might convey that idea is this:—"Few, I think, would look for animal life in their nitrate baths, yet these remarks may, if of no further use now, call the attention of photographers to the fact of its supporting living organisms, even to fatness, and elicit, perhaps, more of their history and structure;" But I do not think it was so meant, as in another part he says, "Of their life history I know nothing;" and from their extreme tenderness I should imagine they had been soaking in the bath a long time dead.

I have found three kinds in my photographic room, and have, I think, enclosed some of each. Only one kind (those with long hairs) are at all numerous.—I am, yours, &c.,

ARTHUR C. STERRY.

September 22nd, 1862.

To the Editor.

Sir,—Your favour of the 29th ult., with accompanying specimens of *Acari* (forwarded by Mr. Sterry to you on the 22nd), reached me safely the following morning. Three of the insects in the glass tube were alive after their *long* imprisonment. Many of the *Acari* were very much mutilated, and possibly had been preyed on by the others. I forthwith examined about thirty-three of the specimens, and found, as stated by Mr. Sterry, three kinds. Those furnished with the long spring hairs so closely resembled those found alive on the surface of the fluid in the

nitrate bath, that they appeared to be the same species; for the only differences remarked, on careful examination, were such that, to my mind, scarcely warranted a distinction. Having four of the old specimens by me which had been long soaking in glycerine, these were mounted for comparison, as also some of Mr. Sterry's, and a sketch made of the points that struck me as differing, which, with one of the slides with two specimens mounted on it, some slides prepared with the insects from Mr. Sterry, and the rest in the tube, were sent the same evening to a friend well versed in these examinations, for his opinion. Circumstances prevented his attending to the subject so soon as desired, and his answer only reached me last night. He writes:— "I have not yet seen Mr. Sterry's letter in the Journal, but consider the specimens he has sent as most important He undoubtedly sends two or more species, but one I quite incline to believe is the same as yours; and, as he obtains them in other places than the bath, I should exceedingly like to see some of them alive, and without any deposit on them." The specimens were all dead when he proceeded with their examination.

Now, as regards the doubt Mr. Sterry appears to throw on my observations, I will suggest a reference to the note published in THE BRITISH JOURNAL OF PHOTOGRAPHY on June 16th, and merely add, to strengthen those remarks, that I was lately staying at the house of a friend, who assisted at many of Mr. Cross's experiments, which he described with their results, as stated by Dr. Noad in his lectures on electricity, &c. That the *Acari* were capable of protecting themselves from the destructive action of the fluids in which they appeared I have no doubt from their statements.

Mr. Sterry found his specimens dead in the nitrate bath, which, he says, was "covered with an air-tight India-rubber cover for some months;" and in the corked bottle of distilled water they were also dead. *Supposing* the insects that were thus found to be the same species, the circumstances are a little different, as the cover in my case was not air-tight. Mr. Sterry has now the opportunity to clear up the points omitted in their "life history," by furnishing the details of the duration of their intra and extra periods of gestation—their age, habits, and other particulars involved in that term. I believe we shall eventually find these *Acari* to be closely related to the *Acarus Crossi;* but, in the present absence of specimens for comparison, it is perhaps well not to prejudice the question —I am, yours, &c., R. L. MADDOX, M.D.

October 10th, 1862.

PREVENTION OF SULPHURISATION IN THE FIXING BATH

To the EDITOR.

SIR,—I send you the following account of experiments performed with the object of determining the relative merits of chloride of sodium, carbonate of soda, and acetate of soda when employed to decompose the nitrate of silver in the prints to prevent sulphurisation in the hypo. bath; and if you think it worthy of insertion in THE BRITISH JOURNAL OF PHOTOGRAPHY, it is at your service:—

Experiment 1. Having prepared pure chloride of silver thoroughly washed, I poured upon it a small quantity of solution of hyposulphite of soda, one part of the salt to five of water. A portion immediately dissolved; but a large excess of chloride of silver remained, and was left in the solution for fifteen minutes, being occasionally agitated. At the end of that time—being still perfectly white, and showing no sign of the formation of sulphide—the chloride of silver was thrown upon a filter, and water passed through for some hours. It was then boiled for a considerable time in concentrated nitric acid, and the acid, being afterwards tested, gave no evidence of the presence of either silver or sulphuric acid, proving that the decomposition of chloride of silver by hyposulphite of soda takes place only in presence of excess of hyposulphite of soda—or, in other words, the formation of isolated, and consequently unstable, hyposulphite of silver does not occur under the circumstances detailed.

Experiment 2. Having dissolved some acetate of silver in water, a small quantity of the before-mentioned solution of hyposulphite of soda was added. A white cloud of hyposulphite of silver appeared, beginning to change colour immediately, and becoming in the course of one minute of a deep brown, showing that the decomposition of acetate of silver by hyposulphite of soda does take place without the presence of excess of hyposulphite of soda. Hyposulphite of silver is formed in an isolated state, and immediately begins to resolve itself into sulphide of silver and sulphuric acid.

Experiment 3. An excess of carbonate of silver was added to solution of hyposulphite of soda. A part dissolved immediately, and the remainder retained its white colour some time; but at the end of eight minutes it had acquired a light brown tint, which continued slowly to deepen.

If, now, we take a photograph containing either free nitrate or acetate of silver, and immerse it in the hyposulphite bath, the first portions of hypo. that come in contact with the silver salt in the pores of the paper are converted instantly into nitrate or acetate of soda and hyposulphite of silver, which latter remains undissolved until succeeding portions of hyposulphite of soda come in contact with it; meanwhile its re-solution into sulphide of silver and sulphuric acid is progressing to a greater or less extent, according to circumstances. Now, in the case of a photograph in which the nitrate has been converted into chloride, the hyposulphite of silver never exists in the isolated and unstable condition, but is formed gradually as a sufficiency of hyposulphite of soda to form the soluble and comparatively stable double salt presents itself to the chloride of silver.

The second experiment seems to show that the test mentioned by Mr. G. Dawson, in his article headed *A Lesson for the Learned* (THE BRITISH JOURNAL OF PHOTOGRAPHY, September 15th, page, 351), as demonstrating the presence of undecomposed nitrate of silver in solution of acetate of soda, is fallacious. Of course I feel somewhat disinclined to put faith in conclusions of my own when at variance with the views of a gentleman of Mr. Dawson's ability. But the experiment was performed twice with the same result—first with acetate of silver, prepared by mixing solution of nitrate of silver with excess of solution of acetate of soda and washing the precipitate quickly; and the second time, in order to avoid the possibility of the presence of any undecomposed nitrate of silver, the experiment was tried with acetate of silver formed by the action of acetic acid upon thoroughly washed oxide of silver, so that the above is the only conclusion I can arrive at at present.—I am, yours, &c. R. W. A.

[Having forwarded a copy of the preceding to Mr. Dawson, he sends the following in reply:—

"Leaving out of question, in the meantime, the disputed point of whether the whole of the nitrate is converted into acetate of silver by adding an excess of acetate of soda, Experiment 2 proves that the behaviour of acetate of silver in hypo. is precisely the same as the nitrate, and generates the deleterious sulphur compounds and sulphuric acid quite as readily. It is, therefore, dangerous; and, unless the recommendation I made in my paper *On Positive Printing*—of washing thoroughly—be attended to, sulphuric acid will be generated in the fixing bath, and it is of no practical importance whether this arises from free acetate or nitrate of silver. Distilled water at 60° will dissolve seven grains of acetate of silver—at a higher temperature much more—and the solution comports itself in all respects like the nitrate, except with the test for the acid."]

METHYLATED SPIRITS FOR COLLODION.

To the EDITOR.

SIR,—Receive my sincere thanks for your kindness in answering my "queries" through the Journal.

The form in which I put the "5th query" was for the sake of brevity. What I meant was—1. Can I remove the lenses from the tube, and supply their places by others of the same diameter, but *shorter* focus, and still get as good results?

Now, Sir, if I am not trespassing too much upon your valuable time, I would like your opinion on the following statement of a high authority:—2. I am about to make some collodion, and I intend to try absolute methylic ether and alcohol, on the authority of Dr. Sheridan Muspratt. He says, in his *Chemistry*, vol. II., p. 699:—

"*Absolute* methylic ether and alcohol appear to answer the purpose exceedingly well, and are much cheaper than pure spirits, since they pay no duty.

"They have also this advantage, that the iodised collodion does not become so quickly deteriorated as when pure spirits are used."

Looking to you as a "guide"—for editors are supposed to know everything—and hoping you will not deem me troublesome,—I am, yours, &c.

October 8, 1862. T. W., JUN.

[1. You do not even now state whether you allude to a single or a double combination lens. However, if a single one, it is probable that the diaphragm would not be properly placed; but, if a double one, the matter would be still worse, because the distance between the lenses is an important element in the construction of the whole.

2. We are sorry to differ from the learned Doctor; but truth compels us to do so. Methyl invariably impairs the nitrate of silver bath with which it comes in contact. That you can take pictures upon collodion made as you propose there is no denying; but you will find that, in a short time, fogging will commence. A little more acid to the bath will prove a temporary remedy at the expense of sensitiveness; but, sooner or later, your bath will be entirely ruined, nothing but a very faint reddish transparent image being obtainable.

Again: Iodised (methylated) collodion will not become so quickly *coloured*, even when iodised with a potassium salt, as collodion made with pure hydro-carbons; but, unfortunately, in this case the colour is not a test of its condition, deterioration proceeding as usual, notwithstanding the absence of colour.

This is our own experience, and we had it reluctantly confirmed by our friend, Mr. Hardwich, and several other careful scientific observers, so that we have not a doubt about it.—ED.]

TONING.

To the EDITOR.

SIR,—I fear I am rather late in the month to get a reply to a query in your Journal; but if late it will be welcome on a future occasion.

You have answered so many persons relative to *toning* that I am almost ashamed to trouble you on the subject. I find it very difficult to get the tone I wish in the neutral gold-toning, viz., *the purple black*. The tones are beautiful at first when taken out of the toning bath—*rich dark purple*—but they change in the hyposulphite, and do not return when washed and dried. It is easy to get rich browns, or, again, clear blacks and whites; but the rich purple seems too fleeting. I have pushed the toning far, and stopped it at every stage, with the same result. I got more agreeable tones with the old system, and have now prints toned by it six and eight years without becoming spotted. Your opinion and advice would much oblige.

I should say that I sensitise on an eighty-grain solution, fix ten minutes, wash well in several waters—sometimes with an addition of salt—and tone with one grain chloride of gold, ten grains bicarbonate of soda, and six ounces of water. The sensitising bath is slightly acid. Is this correct? or should it be made neutral?—I am, yours, &c., K.

[The difficulty experienced is probably due to the kind of paper employed, and this is increased by the washing with salt and water. Saxe paper, albumenised with ten grains of *chloride of ammonium* to each ounce of white of egg, and treated as you have described, omitting the salt and water washing, ought to yield good purple tones in the gold bath, and remain unaffected in the subsequent fixing bath.—Ed.]

BATH COMPLAINTS.

To the Editor.

Sir,—Would you be so kind as to inform me—1. If silver precipitated from its nitrate by means of *copper* will be sufficiently pure to dissolve in nitric acid without fusing, and, if so, is it not less trouble than using salt for that purpose? If not—

2. Can chloride of silver be reduced to the metallic state by means of a flux in an ordinary culinary fire, and how long would it take to do so?

3. Would it be a good plan to precipitate any old baths (out of order) by means of copper, wash the precipitated silver, and then redissolve in nitric acid, crystallise, and use it for a printing bath?

4. I saw in one of your numbers an article on baths, in which the writer said that the best and quickest way of purifying an obstinate bath, and the way he adopted more than any other, was to precipitate it with carbonate of soda, and then redissolve in nitric acid.

A friend informs me that none but the most experienced chemist could succeed in doing this. Is this the case? and, if not, if you can give the exact method of doing it I am sure it would be of the greatest use to the poor amateur perplexed with a foggy bath.

I cured one of my baths once by adding cyanide and filtering out the precipitate. I have now a foggy bath which defies every attempt to subdue it, and therefore write to ask your advice before throwing it down with salt or copper.—I am, yours, &c., SIMPLE SIMON.

[1. Silver precipitated in the manner described is unsuited for re-solution in nitric acid, only in so far as it would contain traces of copper, from which it would be very difficult to free it.

2. See an article by Mr. Corey, in the present number.

3. The plan suggested will do.

4. The method alluded to is an exceedingly good one, and, contrary to the opinion of your friend, we think you would not find much difficulty in conducting the necessary operations. Having precipitated the silver in the form of carbonate by the addition of carbonate of soda, the precipitate is collected on a filter and freely washed by pouring ordinary water thereon. When the water which comes through is tasteless, this operation may be regarded as complete.

In dissolving this precipitate in nitric acid, great care is necessary to avoid having an excess of acid. The point to be attended to is that of having a slight trace of undissolved carbonate of silver still remaining in the vessel at the conclusion of the operation. This ensures your obtaining a neutral solution of nitrate of silver. The *exact* proportion of nitric acid, however, it would be almost impossible to give, since without drying and weighing the amount of anhydrous carbonate of silver, it could not be determined.—Ed.]

ANSWERS TO CORRESPONDENTS.

J. G. T.—To hand.

J. E. E.—Received. Notice in due course.

A. C. S.—Received, and forwarded to Dr. M.

R. L.—Locust.—E. P. J.—Received with thanks.

R. O. B.—See numbers 142 and 159 of this Journal.

Robt. H.—Many thanks for your good wishes and compliments.

John Drew.—Send your address and we will lay the matter before the Secretary.

Q.—Mr. Wilson's or Mr. Blanchard's sun-set views will exactly meet your requirements.

Ramo.—We will forward a note to the gentleman you name, if you send it under cover to us.

A. M.—We believe Sir John Herschel was the introducer of hyposulphite of soda as a fixing agent.

F. Rowell.—We cannot recommend particular dealers, but refer you to our advertising columns.

W. H.—The *manual* lately published by Mr. C. Jabez Hughes will meet your requirements for the present.

J. B.—See number 144. Your idea about printing has been anticipated years ago; but on trial it was not found to be available.

P. J.—Your specimens are deficient in toning, though the negatives are not bad for a beginner. You must leave the proofs longer in the toning-bath.

A. B. C.—Some time back Mr. Lake Price furnished illustrative specimens to subscribers only; but we believe that he has entirely abandoned the art.

J. H. S.—We have no cause to apprehend injury to the gutta-percha trough from the slight acidification of the nitrate of silver solution with nitric acid, as you propose.

Patience.—1. Yes! See article by Dr. van Monckhoven, current volume, page 265.—2. Insufficient deposit of gold in the toning bath: leave the print longer in the gold bath.

Edward Lees.—We have repeatedly stated our preference for a bi-lens camera, accompanied by the reasons for such preference: it is therefore needless to insist upon it further.

T. Leath.—For "instantaneous"-work instruction you had better procure a pamphlet recently published by Mr T. C. Ponting, of Bristol. See also the paper by Mr. Kibble in this number.

Olla Podrida.—Your note may well be described as *de omnibus rebus et quibus dam aliis*. However, it was very amusing, and we enjoyed a hearty laugh over it; but we should get into dreadfully hot water were we to publish it.

S. G.—You require a thermometer of glass only, with the graduation on the tube itself, for the preparation of pyroxyline in perfection. You can procure an instrument of this kind at Negretti and Zambra's, Hatton Garden, London.

S. Sealy.—Most of the negatives taken on the occasion to which you allude were under-exposed, no previous experience having been acquired relative to the deterioration of actinic power in the building. As regards "interiors," we have rarely, if ever, seen better executed ones than those of the Library, at Cambridge, by Mr. Ernest Edwards.

Ferruose.—It is most amusing to find anyone accusing pyrogallic acid of "not being under control," and, *therefore*, using an iron developer instead. The very converse of this proposition is the fact. If your pyrogallic acid quickly fogs your negatives, it is simply because you have too little acetic acid to restrain it. The remedy is therefore obvious.

Tyro-Photo.—All under-exposed, and the printing very indifferent. Can you not get a lesson or two from an acquaintance or friend? If not, you had better purchase a good small negative and a print from it, and try in your own printing to imitate the latter. When you have tolerably well succeeded, you will most likely be able to appreciate in what a good negative consists.

J. H. M. S.—Of those in your list the only one with which we are practically unacquainted is number seven, and we give a decided preference to number four. You may rely upon the strict accuracy of the assertion made by the gentleman you name—not only because of his integrity, but because he knows very well what he his about: he is a man of observation and judgment.

W. H. H.—Line your packing-case with cork, surround each bottle tightly with sheet gutta-percha, and with a hot wire cement the joint; fit on a bottom piece in the same way, cementing it as before, and you will have a covering which will save the contents of the bottles even should the latter be accidently broken. They can be packed closely with cork cuttings if you can procure them: if not, paper cuttings will do.

Richard Law.—1. The three kinds of collodion which you indicate are all of high repute.—2. In warm weather we do not advise an iron developer in preference.—3. Yellow glass covered with one layer of yellow tammy ought to do well for the window; or you may use the yellow prepared silk recently brought out by Mr. Smartt.—4. You can take a portrait properly in the open air, provided that you shade your sitter judiciously with a cloth or canvas screen overhead and on one side.

Ekomyd.—We are too much pressed with correspondence to permit our giving private replies. Your point of view of the church, &c., is well selected, and the photography good; there is, however, a deficiency of definition of the bushes in the immediate foreground, and, though the view is excellently selected, it appears somewhat tame and flat, from total absence of cast shadows, clearly owing to the want of sunshine, which in such a subject is of immense importance. With regard to the card-portraits, the backgrounds are very objectionable, as they not only distract the attention from the figures, but induce an absence of apparent relief, the figures seeming almost in contact with the wall: a perfectly plain background would be preferable. The pose is good in both instances,—easy, graceful, and natural; but the negative of the lady in the dress with the scalloped trimming has not been sufficiently exposed, as indicated by the heavy shadow on one side of the face, and want of detail in the white sleeves. As a rule, in ladies' portraits it is better to over-expose than otherwise, as this conduces to softness of effect. Your background is too strongly lighted: if you can shade it somewhat, without shading the figure, it would produce greater relief.

W. T. G.—The hint to which you refer applies only to the chloride of gold and carbonate of soda bath: to restore its alkalinity the addition of more carbonate of soda is the obvious way. The black deposit is irremovable except by filtration. We have little doubt that you have immersed proofs in the bath that were imperfectly washed. We have drawn Mr. Dawson's attention to your inquiry, and he says:—"The acetate of soda and gold toning-bath, even although the gold has introduced therein some free acid, will after use be generally found to have become slightly alkaline. In this condition it will throw down gradually, in a metallic state, any residue of gold which may remain after toning. The addition of hydrochloric acid till acidity is faintly indicated, will correct this tendency; but in such a case, before the bath can be again used to the best advantage, it must be made neutral or slightly alkaline with carbonate of soda. The better way to avoid all unnecessary trouble is, not to tamper with it at all, except to add gold when needed, and to filter when dirty. Experiment has proved that one grain of chloride of gold is amply sufficient for one whole sheet of paper: no more gold than is sufficient for the work in hand should be added to the bath at one time. With these precautions you may be secure against waste, and can preserve the toning-bath in an uniform working condition totally unobtainable if acid and alkali in indefinite quantity be alternately added."

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 177, Vol. IX.—NOVEMBER 1, 1862.

Clarification.—One of the chief points in the process described by Mr. J. W. Osborne, of Melbourne, as appertaining to his method of preparing suitable negatives for his photolithographic operations, consists in what he terms a "clearing up" of the negative preparatory to its intensification: it consists in re-iodising the developed image to a very slight extent, and at the same time dissolving off the slight deposit from the shadow. The iodising is effected by pouring over the plate a solution consisting of two grains of iodide of potassium in an ounce of water, afterwards saturated with iodine, and then diluting this saturated solution to a considerable extent with water. We do not find, on reference to the paper, any directions for the use of a weak solution of cyanide of potassium (as stated by a contemporary) for removing from the shadows the iodide of silver thus formed; nor do we apprehend such a proceeding to be at all necessary, because the iodide of potassium solution has a slight solvent action upon iodide of silver, quite sufficient for the purpose of clearing the shadows. This is supposed to be a novelty by the author of the paper; but in this he is mistaken, as we know more professional portraitists than one who generally, if not invariably, follow this practice, and have done so for the last three years or more, when using an iron developer for their portrait negatives—in one case the principle being adhered to, but with the slight manipulatory variation of the re-iodising being effected by adding a few drops of tincture of iodine to water to make the solution for flowing over the plate instead of using that directed by Mr. Osborne: the plate is then washed, flooded with a very weak solution of nitrate of silver, for a moment exposed to the light, and then further intensified by the use of the ordinary pyrogallic acid solution. However the little manipulatory details may vary, of course the principle of action is the same in all.

This practice reminds us of one we used to employ some years ago for an analogous though different purpose. As a member of certain Photographic Exchange Clubs we used sometimes to receive proofs that were far too deeply printed to be agreeable to the eye. When printing thirty or forty proofs from the same negative—as was requisite to be done for some of the Clubs to which we allude—it is almost a miracle if some copies do not turn out darker in colour than is at all desirable; and, as the printing of so many copies becomes rather a task than a pleasure to the amateur, it is not surprising that some objectionably dark ones were occasionally allowed to pass muster by some of the members at least. When we happened to receive any of these mulatto-looking prints—as we called them—we used to improve their appearance by the following treatment:—

Into a bottle that would contain four ounces of water, when full, we let fall a few drops of pure bromine (a dark-coloured liquid) as rapidly as possible, and instantly put in the stopper of both bottles. This precaution is necessary, as bromine is a very volatile substance of an intensely stifling odour, the vapour being heavier than the atmosphere. The bottle of water, with the few drops of bromine therein appearing like dark beads, was then shaken violently for some time, and the water acquired first a yellow and subsequently an orange coloured tint: it was then allowed to stand for some time in order to allow any of the undissolved bromine to subside. An ordinary photographic dish of earthenware—sufficiently large to contain the print to be operated upon—was then partly filled with water and the proof immersed therein. A certain quantity of the aqueous solution of bromine was then measured off, according to the degree of over intensity of the proof to be reduced, the water from the dish poured into the same vessel, and the whole mixed together: it was then immediately returned to the dish, and moved backwards and forwards until the yellow colour of the solution had disappeared, when the print was washed in several changes of water. If still too dark, the same operation was repeated, but with a smaller quantity of bromine solution. For most prints of about nine inches by seven inches, a quantity of saturated aqueous solution of bromine varying from about half a drachm to two drachms was found sufficient. By this method many prints were utilised that were before scarcely presentable.

New Printing Process.—The new printing process described by Mr. Cooper in a paper read at the North London Photographic Association meeting for October, and which will be found in another page, will no doubt be read with interest by many of our readers who are but imperfectly satisfied with the present style of proofs upon albumenised paper—a style submitted to as a disagreeable necessity in order to avoid the loss of much beautiful detail which is attendant upon the more artistic proofs upon plain paper. This process was cursorily noticed at the September meeting by Mr. Simpson, who had received for publication an account of it from Mr. Cooper only just prior to his setting out to attend the sitting. At the meeting held on the 22nd ult., Mr. Cooper exhibited, in illustration of his paper, numerous admirably-executed specimens of photographic printing by his process. We have hitherto abstained from any comment upon the subject, because, in the first place, we had seen but few of the results, and on reflection there appeared to us to exist at least one insuperable barrier to its being successfully applied—we mean the generally-known and admitted tendency in all gum resins to become more or less discoloured by exposure to the air. We remember to have heard an extensive manufacturer of varnish assert on a former occasion, when discussing the properties of these bodies, "that they invariably turned more or less yellow in colour by the lapse of time, and that in his experience there was absolutely no exception to the rule"—a very strong assertion it must be admitted. Now our great desire is to find a process that will enable us to entirely forego albumenised paper without loss of detail or of *transparency in the shadows;* and it is in order to secure this last-named excellence that albumen retains such a hold upon photographers, for it must be admitted that upon plain paper the shadows are sometimes painfully solid in appearance. It is with reluctance we feel compelled to report that, beautiful as Mr. Cooper's specimens undoubtedly were—many of them being highly artistic in treatment—the deficiency of transparency in the deep shadows, when any such were present, was as perceptible as in proofs upon ordinary

plain paper. There is one point requiring comment in Mr. Cooper's communication, which we did not notice during the reading of the paper: he attributes the deficiency of intensity to the chloride being "locked up" in the resin. The phraseology is obscure. If he means to imply thereby that a portion of the original chloride does not become converted into chloride of silver we think he errs a little in judgment; and if he alludes to the chloride of silver as being thus "locked up" so as to be partially withdrawn from the influence of light thereby, the same would be the case with the whole of the chloride of silver, and the actinic action ought to be slower, whereas he affirms it to be quicker, than upon ordinary chloride paper. We notice this chiefly to record our dissent from the "locking up" theory. We would remark that Mr. Cooper very wisely did not attempt to conceal any of the imperfections of his process, but, on the contrary, drew attention to them, with a view to enlist aid in overcoming them—a course deserving of all commendation and encouragement. It is therefore with regret that we have to confess our inability to perceive any advantage over plain paper that the new process possesses in its present condition. It must, however, be remembered that it is as yet in a very youthful state, and the fostering care of kind friends may do much towards its improvement.

Photography in Disgrace.—In a recent number of the *Athenæum* a considerable amount of space is devoted to a notice of photography at the International Exhibition—wherein, by the way, Colonel Sir Henry James's process of photozincography is brought prominently forward, and Mr. Osborne's photolithographic process ignored. In this notice we fancy we can detect the result of interference—or, let us say, the influence—of certain "authorities" in the Department of Science and Art at South Kensington, so strongly does it savour of what is vulgarly termed "snubbing;" for (notwithstanding the assertion "in another place" that photography henceforth takes her place with the fine arts in consequence of "her Volturno having been won") we find the following authoritative dictum :—

"Mr. H. P. Robinson illustrates, more completely perhaps than anything else can do, the fallacy of expecting a mental operation, such as the results of pictorial art are, from a chemical process. In this case the operator has placed some models (children and others), according to a pictorial arrangement, in the hopes of making a picture. His *Holiday in the Wood* (131), and others here, with their set air of portraitures, stiffness, and fixed smiles on the models' faces are miserably depressing to the spectator. This failure of intention is the more observable, seeing that the operator has taken great pains to obtain a contrary result. In the work named, this is less offensive than in 128-9-30."

This appears to be rather loose writing for our usually supremely correct contemporary. In the first place, the words "anything else" would, with the context, seem to imply that Mr. H. P. Robinson is a *thing;* secondly, we are quite satisfied that neither the gentleman named, nor any one else possessing common sense, can expect a mental operation to be the *result* of a chemical process, though there is no valid reason why a mental operation should not find expression—which is quite another affair—through the agency of a chemical process, any more than through the agency of pen or pencil; and thirdly, neither one failure nor a dozen failures can logically prove that the thing attempted cannot be accomplished.

This attack is one of the most agreeable symptoms we have noticed for some little time—agreeable, as being indicative of the real advance which our art is making, by showing the alarm and repugnance of those who affect to look down upon it. A pat on the back may be the more agreeable operation to undergo, but commend us to a kick for displaying the real temper of the performer of the operation. When the graphic artist—we mean the foe to photographic art—says "it is really very good," we may be quite sure he fears no rivalry; but when he says "ridiculous!" "absurd!!" "impossible!!!" &c.,—well, the followers of the art that is not merely graphic are doing—perhaps too well.

ON SOME OF THE CHIEF CAUSES OF FADING OF PHOTOGRAPHS.*

By George Dawson, M.A.,

Lecturer on Photography at King's College, London.

The short-lived beauty of many of our finest photographs is deservedly the great opprobium of our art. I need but point to the deplorable condition of most of the specimens in the Kensington Exhibition as substantial evidence of the truth of the charge, and this after but a limited exposure in that apparently destructive atmosphere. We may be sure all the pictures exhibited there were prepared with more than usual care, and therefore less likely to be injuriously affected by external influences than the ordinary run of photographs offered to the public. I may also appeal to the experience of every photographer, whether he does not find that, out of a number of prints, all apparently toned, fixed, and washed in the same manner, some are doomed to premature decay—others preserve their beauty unimpaired for many years, but finally yield to the mysterious and all-destroying influence. Indeed, until the precise chemical nature of all the substances employed in forming the image, and their mutual reactions are fully understood, our efforts to ensure permanency will be, at the best, but uncertain and deceptive. Some of the conditions of decay are now generally well understood, and carefully avoided: others of a more complicated and probably organic character have hitherto baffled all attempts of chemistry to explain their true nature. When the baneful effects of free sulphur in a photograph had become almost universally recognised, it was fondly hoped that the substitution of the alkaline gold for the sulphur toning would tend to greater stability if not to permanency. This idea is unquestionably correct, were we as careful as we ought to be in freeing the surface and texture of the paper from some injurious, and in many cases easily removable, salts of silver, and also from some soluble sulphur compounds with which the print must come in contact in its progress towards completion. In all faded photographs that have come under my close investigation, whether toned by the alkaline gold or sulphur method, the destructive agent sulphur has always been the primary cause of decay—or, to speak more correctly, sulphuret of silver is the ultimate effect. Decomposition of the hypo. is undoubtedly the most fertile source of sulphur in the print, and to that most cases of fading may reasonably be referred. I would wish, therefore, to call your attention to some of the inorganic and organic substances which find their way into the bath through the usual channel of unfixed prints, and effect decomposition there.

First: Inorganic.—It would be a waste of your time at the present day to prove the injurious nature of the now exploded sulphur-toning system. It has had its day and gone to the grave: let it rest in peace, and its pictures with it. Of all things, sulphur is what photographers, now-a-days, wish to avoid in their prints; but it is clear they cannot do so unless they carefully guard against the introduction into the bath of substances which notoriously liberate sulphur. Of this class there are many which rarely occur in practice, and may be omitted here. I need only mention the every-day-occurring nitrate, acetate, phosphate, and carbonate. The two former decompose hypo. with great energy, the phosphate and carbonate more slowly but, perhaps, not less dangerously. The resulting decomposition is, in each case, the same, and may be thus stated:—The newly-formed hyposulphite of silver ($Ag\ O, S_2\ O_2$) splits into sulphuret of silver and sulphuric acid ($Ag\ S$ and $S\ O_3$): the latter on account of its superior affinities combines with some of the soda of the hyposulphite, thereby displacing hyposulphurous acid, which, being incapable of existing in an isolated state, throws down one of its equivalents of sulphur, and escapes as sulphurous acid gas, discernible by its smell—thus—

$$Na\ O, S_2\ O_2 + S\ O_3 = Na\ O, S\ O_3 + S\ O_2 + S.$$

Besides the sulphuric acid thus spontaneously generated, almost any other acid added to the bath, either by design or through inadvertence, will *produce the same consequences, on account of the feeble affinities of hyposulphurous acid,* and ought therefore to be rigidly excluded. The true safeguard against these deleterious salts of silver is perfect washing of the prints in ordinary water, and finally in salted water, before toning. Hitherto I have discouraged the use of a final bath in salt water for untoned prints. From recent experiments, however, I am disposed to retract my opinion, having found free nitrate in them, after they had passed through many waters for half-an hour, but none in others that had received a final salted bath. The highly manageable chloride may thus be made the only inorganic silver salt necessarily present in the print when introduced into the hypo., if we except the

* Read at a meeting of the North London Photographic Association, Oct. 22, 1862.

reduced chloride, which, as experiment shows, exercises no appreciable effect on it one way or the other.

In previous papers read at our meetings here, I have proved the chloride of silver to be soluble in hyposulphite of soda to saturation without generating free acid and sulphur—in fact till the whole of the hyposulphurous acid has combined with the silver. When this point has been reached, the white, gritty, heavy, and insoluble hyposulphite of silver is deposited, and nothing but chloride of sodium remains in solution. Moreover, a large excess of chloride of silver may be thrown into hyposulphite of soda, and remain there for an indefinite period without the liberation of acid or sulphur. We have, therefore, in the absence of acid from without, nothing to fear from the chloride of silver in hypo., and may make our minds easy on that point.

But, besides those inorganic substances which we know and can guard against, there may be, and generally are, others possessing affinities for silver in the texture of the paper. They may have been introduced there either as an adulteration or in the form of bleaching powder and antichlore. The bleaching agent—chloride of lime—after having performed its functions, can all easily be removed by washing, with the exception of a little free chlorine, which adheres with great tenacity to the fibres of the pulp. If it were allowed to remain there, the paper after some time would become rotten and unfit for use. To counteract its effects a quantity of sulphite or hyposulphite of soda is always added. Now, if the products of the decomposition and the excess of the salts (of the latter in particular) be not again carefully washed away, we have at once the elements of an unstable photograph, whenever the paper comes in contact with the silver. Less dangerous, and quite as efficacious, although perhaps not so cheap, antichlores might be used—the protochloride of tin, for instance. But it strikes me that the small amount of chlorine left in the pulp would be by no means hurtful in photographic paper. If I may judge from the effects of chlorine on cotton, it will take many months before the fabric becomes sensibly deteriorated. By that time it may fairly be supposed the paper will have received a most effectual antichlore from the nitrate of silver bath, which will convert the whole of the free chlorine into chloride of silver. A trace of nitric acid will be set free; but I consider that no disadvantage in a positive exciting bath.

I have now mentioned, I think, most of the inorganic substances likely to be met with in the preliminary operations of positive printing. With the exception of one—the chloride—all of them act injuriously on the hypo. bath, and, from decomposition therein, form insoluble and easily-decomposed sulphur compounds in the paper. There still remains another class—the organic—much more difficult to deal with, because their nature is very imperfectly understood. It includes albumen and the substances employed in sizing the paper. With respect to the former, I may at once refer to a paper lately published by Mr. Spiller, in which he proves, by an undoubted test, the existence of silver in some form in the high lights or whites of albumenised photographs. Having repeated his experiments—and perhaps pushed them farther than he has time to do—I can fully confirm their correctness in every particular. It is indeed impossible to remove by any known mode of fixing and washing the whole of the silver from its albuminate, whether it has been exposed to light or not. I shall not enter into this part of my subject in detail at present, as it is still under experiments requiring time for their completion. In the meantime the silver or salt of silver has not been proved to be conducive to fading, although the probability is that its tendency lies that way. According to my experiments completed so far, albumen coagulated by heat, before treatment with nitrate of silver (but not exposed to light), retains after fixing and washing more silver than when merely dried, and moist albumen less than either. Hyposulphite of soda, cyanide of potassium, and ammonia, quickly dissolve that portion of the albuminate of silver which is sensitive to light; but neither of them seem to have the least effect in dissolving that compound, which is insensible. If I may venture to conjecture as to its nature, from observing some of its reactions, I should suppose it to be the inorganic phosphide, sulphide, and metallic silver, reduced from organic sources. More extended experiments, however, will be required to determine the question, and some time must elapse before this residual silver can be proved to be of itself an element of instability, when exposed to different conditions of atmosphere.

The second organic compound in the paper tending to decomposition is the size. In respect of this necessary ingredient, and other unnecessary adulterations, we are quite at the mercy of the manufacturers. Starch can be shown to be the principal sizing material of most of the foreign papers. The English makers seem to use exclusively impure animal gelatine, or some kindred substance. I do not pretend to know their secrets, nor why they do not serve us better; but this I may safely assert, they do not study their own best interests when they overlook or despise the requirements of the photographer. From my own observation I should feel disposed to consider starch the proper size for photographic paper, inasmuch as, taken simply by itself, it has less tendency to form insoluble silver compounds than the coarse and impure animal gelatine generally employed. I am induced more strongly to accept this conclusion from having lately subjected several specimens of plain paper to the same critical experiment as Mr. Spiller's. After salting and drying in the usual way they were removed into the dark room, where they remained away from actinic light till all the after processes were completed—viz., exciting, drying, washing in several waters, finally washing in salt and water. Each paper being then cut into three parts, one part was fixed in cyanide of potassium, another in ammonia, and the third in hyposulphite of soda; and then, after washing in running water (and draining), the hydrosulphate of ammonia test was applied. It showed no symptoms of silver in thin and thick Canson about five years old; in thin Saxe, new and old; nor in one specimen of thick Saxe. But its presence was manifest in thick English paper (no water-mark); in one specimen of reputed thick Saxe; and very conspicuously in two of thick Rive bearing the water-mark. Here again, without placing the whole blame on the shoulders of albumen, we have *a probable element of instability in the papers habitually used*, arising either from the size or in the manner already suggested. Whether the papers were fixed in hypo., ammonia, or cyanide, the effect was always the same—a fact which removes it out of the class of hyposulphite decompositions.

Fixing and Washing.—From the preceding observations, it ought evidently to be our object to aim at retaining in the picture to be fixed only the salts of silver, which are soluble, and form soluble compounds. Unfortunately it is not always practicable. The chloride, as I have already stated, is the only inorganic salt that need necessarily be introduced into the hypo. along with the paper; but it is out of our power to distinguish what other compounds may also be brought to bear on it, through the medium of the albumen and size, until we know to a certainty all the substances which enter into the manufacture of photographic paper. Many of them are undoubtedly of a dangerous character, as the hydrosulphate of ammonia test abundantly proves; and even those which, in neutral hypo., are completely soluble will always, in the presence of acid, give rise to insoluble and easily decomposable compounds. The best safeguard against the latter is to keep the hypo. always in a slightly alkaline state, and whenever it has exhibited signs of depositing on the bottom of the dish any sediment whatever to throw it away; for no precipitate can be formed there which does not contain sulphur or an unstable hyposulphite. The use of a rather strong solution of hyposulphite is also of importance, since there are some salts of silver soluble enough in concentrated hypo., which decompose and yield insoluble compounds in weak solutions.

Finally: supposing all the silver, excepting the reduced chloride forming the image, has been converted into a soluble hyposulphite, the picture will possess little stability, unless the latter and the excess of hyposulphite of soda be completely washed from the paper. There can be no question but that their imperfect removal is a very common source of fading. Frequent changes of water and draining, continued for several hours, are, in my experience, more efficacious than a running stream for a greater length of time without draining. The solution of the size in hot water has by some been thought necessary for the removal of the last trace of hypo. I do not coincide in that opinion. Cold water alone, if properly applied, is sufficient to free the paper of all that is soluble; and should any insoluble hyposulphurous or sulphurous salt have been formed in the size, or elsewhere, hot water is as ineffectual for its solution as cold.

I have now touched—in some cases rather cursorily and doubtingly, from imperfect knowledge—upon most of the causes of fading which are *intrinsic* and dependent, more or less, on the care of the photographer. Some of them I have shown to be quite under his control; others, in the present state of our knowledge, are beyond his power to grapple with, until a better medium than albumen and the indefinite compound paper has been substituted.

I shall only glance at the elements of instability arising from atmospheric and other influences from without. Should opportunity offer I may again recur to the subject, when some experi-

ments at present on hand are completed. Enough of ground has been broken for one night's discussion, without entering largely into a question for which I am not fully prepared, and upon which so many contradictory opinions have been delivered. We know by experiment that a photograph prepared with ordinary care will preserve its tone for an indefinitely long time enclosed in a hermetically-sealed jar of dry atmospheric air; but, if a few drops of water be introduced, symptoms of fading will begin to be manifested sooner or later, in proportion to the quantity of insoluble salts existing in the print. Photographs, also, have been kept for weeks uninjured in an atmosphere of pure sulphuretted hydrogen, and have speedily faded on the introduction of a few bubbles of atmospheric air. From these and other similar experiments—to which time forbids me to allude more particularly at present—I presume that the destructive principle lies *within* the paper, and is only brought into activity by the oxidising influence of a moist atmosphere. How otherwise can we account for the existence of the ever-present sulphur in faded photographs, which have been shut up in a small portion of moist air, away from all possible contact with sulphur or its compounds from without? By whatever means decomposition is effected, the result is always the same, viz., the resolution of the whole of the silver of the photograph into a silver and sulphur compound.

Some of the gums and pastes generally employed in mounting photographs may also, by turning acid, play an important part in hastening decay; but, as I have already occupied too much of your time, I cannot do better than refer you to the able articles on the chemical nature of these substances now being published by Mr. Martin in THE BRITISH JOURNAL OF PHOTOGRAPHY.

DEVELOPMENT OF THE LATENT IMAGE, OBTAINED IN THE CAMERA OBSCURA.*

By M. D. VAN MONCKHOVEN.

AT an ordinary temperature the picture is generally sufficiently developed in two minutes; but if it be necessary to force the development, it will seldom prove a successful picture. At higher temperature it sometimes becomes necessary to stop the development in half a minute, to prevent the high lights from becoming too dense. Experience alone can give the knowledge necessary to determine exactly the when and how in this delicate operation.

As soon as the solution of pyrogallic acid covers the plate, the sky and the high lights of the picture begin to appear on the primrose-tinted film of iodide of silver: a few seconds after the minor details make their appearance, becoming more and more vigorous, and, as often occurs in a landscape, the sky darkens so much that it is even difficult to see the sun through it. This will give an idea of the amount of intensity which the image acquires, and, without experience, it is very difficult to indicate the exact moment when the pyrogallic acid should be removed by treatment with cold water.

FIG. 63.

POSITIVE PROOF. FROM A STEREOSCOPIC VIEW, BY M. FERRIER.



The quantity of acetic acid added to the pyrogallic also exercises an important influence on the results, and in proportion as it is increased the more slowly the image appears, and the more vigorous it is in character. When, for example, the development of a negative taken from a group of persons, among whom there are some having on white dresses, a large proportion of acetic acid is necessary; while, on the contrary, a dull, grey, sombre monument develops best with a small proportion of acetic acid. This is a delicate point, and requires the exercise of much judgment, aided by extended experience, on the part of the operator.

Let us now say a few words on the characters by which a conclusion may be arrived at as to whether the exposure in the camera has been too long or too short.

In this latter case it is with difficulty that the sky and the other high lights of the picture are developed, and detail in the shadows is never obtained; even after long waiting the image will not appear, in which case it is necessary to take a fresh negative.

FIG. 64.

NEGATIVE PROOF, EXAMINED ON THE SIDE OF THE GLASS NOT COVERED WITH COLLODION.



If, on the contrary, the exposure has been too long, the negative is red and uniform; after fixing, there is an absence of vigour in the blacks, and there is a general fogging spread over every part of the image; the development also has taken place very rapidly. In each case another negative must be taken.

The foregoing is somewhere about the sum of what can be said on the subject of developing. It will have been observed that in the preceding chapter we were able to give our instructions with much greater precision and clearness, while, in the present one, we are obliged repeatedly to say that experience alone can teach certain points inherent in the development of proofs, and that it is necessary that the results should be experimentally shown—a thing which it is of course impossible for us to do. It is only by printing positive proofs on paper from the negatives obtained, and by comparing the definite results with those obtained from the negatives of photographers of acknowledged reputation, that the beginner can judge whether he be in the right way or not.

The most frequent error is over-exposure, arising from an inability to realise the possibility of taking a picture in so short a time. We shall revert again to the subject, and bring again before the reader *figs.* 63 and 64.

Let us suppose that we have to reproduce the monument represented at *fig.* 63, and which represents, as we have previously said, a portion of the Acropolis at Athens.

The sun illuminates these statues with all its meridian splendour; strong shadows are therefore a necessary consequence, which, in order to be correct, we ought to have in our negative.

Let us begin with a negative which shall not have been exposed in the camera more than five seconds; and let us successively increase the time of exposure five seconds in a series of five negatives.

The first negative will be very slow in developing; after several minutes the sky will with difficulty be traced, and some faint indication may be obtained of the parts most strongly lighted.

In the second these portions will have acquired much more vigour, and the shadows even will begin to yield some indication of detail. The third negative will be a good one; but the fourth will be, in every respect, all that could be desired, possessing a due amount of vigour and presenting the aspect of *fig.* 64.

* Concluded from page 349.

The fifth negative, although exposed a longer time, will have acquired a greyish colour. A good negative is blue; but too long an exposure gives it a dull, grey appearance. The shadows, instead of being transparent, like glass itself, have upon them a sensible deposit, owing to the too rapid development.

In proportion as the exposure is increased in any subsequent negative, the grey colour tends to become red; there is a difficulty almost in distinguishing the shadows and the sky; and, in one word, the negative loses all its vigour.

These, then, are the principles upon which the photographer should proceed in the correction of his negatives.

It would be useless to pretend that an accurate judgment can be formed except by long experience. It is not until after several months of assiduous research and after continual disappointment that the beginner will acquire that accuracy of judgment at a glance which will guide him in the fugitive indications of the amount of exposure necessary for a given subject; but, when once this knowledge is acquired, he will be amply rewarded by the small number of defective negatives, as well as by the great progress in the actual practice of photography acquired during the apprenticeship.

It frequently happens that negatives are spotted or covered with curious markings, either in parts or entirely.

FIG. 65.

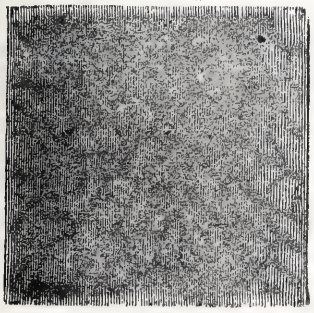


FIG. 66.

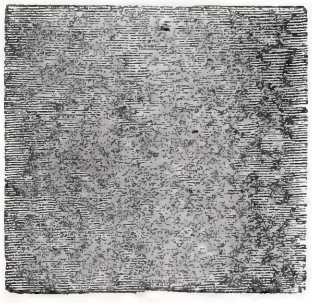


FIG. 67.

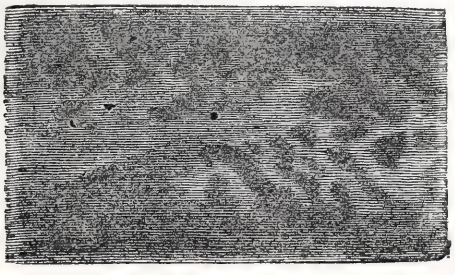
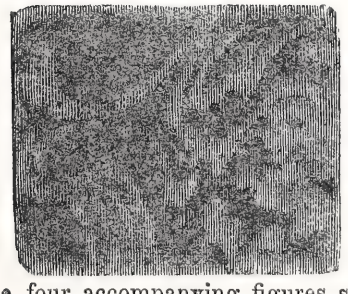


FIG. 68.



We give in the four accompanying figures some examples of these spots, taken from M. de la Blanchere's work; but, in order to avoid confusing the reader by too many recommendations at once, we have appended in a special Note (No. 12) a series of directions and experiments from which he will learn how to avoid the unpleasant accompaniment of these markings.

COATING WITH COLLODION.—At Cambridge, when reading the paper published in our last issue, Mr. Maxwell Lyte practically exemplified how he was in the habit of so turning the plate after the collodion had ceased to drip from it that the corner by which the collodion had been poured off should be uppermost, and the opposite angle of the plate at which the collodion had been poured on should become the lowest. By this means the vapour of ether, by its great specific gravity, is caused to flow back over the plate and to impede evaporation at the side where the collodion was first poured on, where otherwise it would have had a tendency to become dry before it had completely set on the opposite angle of the plate.

NEW METHOD OF PRINTING.*

By H. COOPER, Jun.

THOUGH I hope the time is not far distant when resinised will take the place of albumenised paper, yet there is a good deal to be done in the former process before it can accomplish the wished-for result.

I have the honour to lay before you this evening a few specimens illustrative of my progress; and if you will kindly listen I will make a few remarks on the different methods I have employed, and on the disadvantages and drawbacks at present existing in the process, as I think that their admission is a better way to remove them than to forget the faults and point out the beauties. Many faults arise—not exactly from careless manipulation, but from a want of knowledge of the peculiar requirements of the process; for, after having gained a little skill in the processes we employ, we are apt to wonder why we cannot succeed all at once with a new one—forgetting, for a moment, all the difficulties and disappointments we met with in that which **now** appears so easy.

For instance: after I had printed some dozens upon resinised paper, I lost numbers by not printing deeply enough; and what is more vexing, after a hard day's printing and that to all appearance successful, than to see all the batch becoming gradually faint in the toning bath, without a hope of preventing it?

The prints should be left in the printing-frame till a good part is quite green with bronzing; and, even if the lights become faintly tinted, it will be of no consequence, as they will become quite white again in the toning. Many will say—"But that is a great disadvantage: look at the time a print takes to get bronzed like that, why I shall only be able to print one-half the number from the same negative!"

But you must not forget that the resinised paper is very sensitive to light, and that as many prints may be produced upon it in the day as upon albumenised paper.

I have received many inquiries whether the bath should be acid, neutral, or alkaline. I recommend a *strong* bath, very slightly acid with nitric acid, hardly sufficient to be detected by litmus-paper. My reason for this is, that a very unstable salt is formed in the paper, which causes it to decompose very quickly, and, the more alkaline the bath, the sooner the paper becomes spoilt. In very warm weather, the paper should be sensitised and fixed within twelve hours; but, if it be very cold, twenty-four hours may elapse.

I have also received complaints from several that they have not been able to get warm tones. Sensitising on an alkaline bath is very apt to render the prints cold, as well as to decompose the paper. The use of a new toning bath is also conducive to blueness. I find that a bath prepared as I recommended in the first instance—acetate of soda and chloride of gold, made at least twenty-four hours before using—is the best to obtain rich, warm tints.

The prints prepared with chloride of cadmium seem much poorer than those prepared with a more soluble chloride of calcium or magnesium; because ten grains is about the quantity of chloride of cadmium soluble in alcohol of ·835 degrees s. g. This is equal to a much less quantity of chloride of sodium, as the chloride of cadmium has a much higher equivalent of its base than sodium. Being, moreover, locked up in a resin, it does not, in my opinion, form as much chloride of silver as it would if it were employed in albumenised paper.

By increasing the quantity of chloride of silver in the paper the prints become much more vigorous. To effect this, I have employed the chloride of calcium and magnesium, which, as I have just remarked, are more soluble in alcohol.

There is another advantage over cadmium in the two mentioned chlorides—they are very soluble in water, so that any that remains in the paper undecomposed is easily removed. The prints before you marked calcium and magnesium were prepared on a solution containing fifteen grains to the ounce.

Some of the specimens, as you will see, are salted only on one side.

I thought of this method when I was endeavouring to get more vigorous prints; but since using chloride of calcium I have discarded it, as it is much more trouble than the formula I gave at first. But as you may like to know the details, I will shortly run over them.

The paper, to begin with, is immersed in a solution of frankincense and mastic, made according to the directions which I gave in the *Photographic News* for October 3rd, with the exception of the chloride, which must be omitted, viz.:—

Pure frankincense	1	ounce.
Chio turpentine	1	drachm.
Sœhnée varnish	2½	drachms.
Benzoic acid	1	drachm.
Methylated spirit	10	ounces.

* Read at a meeting of the North London Photographic Association, Oct. 22, 1862.

When the paper is quite dry, float for two minutes or more upon a fifteen-grain-to-the-ounce solution of chloride of sodium. Float on the nitrate bath for three to five minutes. After the prints are finished they should be immersed, before mounting, in the resin solution that was used in the first preparation, to thoroughly encase all the particles forming the image. I would recommend that all prints on resinised paper should be immersed in a weak *alcoholic* solution of mastic. This does not give the prints a varnished appearance, but they will glaze much finer in the rolling. I have found an application of enamel to the prints after they are mounted and rolled is very efficacious in giving depth and transparency to the shadows; but it has also the disadvantage of causing the prints to assume a highly glossy appearance, which is inartistic and very like albumenised paper. It also slightly injures the whites.

The want of transparency and brilliancy is one of the points that I would call your attention to in the resinised paper. Another is the peculiar *granular* appearance of the prints *after* rolling, particularly those on Papier Saxe. The cause of this is obvious—the uneven thickness of the paper. The resin is, as it were, in little hills, and when the paper is passed between the rollers the tops of them get crushed down and polished, leaving the valleys untouched. With a thin sample of Papier Rive that I had some little time back it was hardly perceptible.

From the pieces of prepared paper now before you, you will perceive that Papier Saxe possesses the granular appearance in the first instance. This is also caused by the uneven texture of the paper. The flat appearance of some of the specimens is owing to the want of depth in the shadows, to which I have called your attention. To better show the failings of the process I have brought a few prints on albumenised paper from the same negatives. As regards printing by development—about which I was very sanguine at first—I have not been able to get on at all well, the proofs being very mottley. I have not had much time to devote to this branch of the process, but I hope during the next few weeks to resume my experiments in this direction. One fact with regard to it worth mentioning is that the paper, when prepared with a chloride and a small quantity of a neutral citrate, receives the actinic impression very rapidly, so that it has to be exposed a much less time than is usually requisite for this method of printing. Only the faintest trace of an image should be visible. I bring two proofs which have been the most successful at present. After removal from the pressure-frame they were soaked for one hour in distilled water, and then developed in the following:—Saturated solution of gallic acid, one ounce; distilled water, half an ounce; acetic acid, five drops; and ten drops of a thirty-grain solution of nitrate of silver. They were then toned and fixed in the usual baths. You will not be astonished at the stains on the back when you hear that upon removal from the hypo. bath they were placed in a dish of water, separate from the other prints, and, being forgotten, left there for five days.

All the specimens are *absolutely untouched*, with the exception of one, which is marked.

As I could not well understand from writing how Mr. Harmer produced his prints, I have brought some of the masks used in printing the fancy ones now before you.

I have now only one or two cautions to add:—

1. Let the solution of resin for the first preparation of the paper be perfectly clear and bright before using.

2. Whilst preparing the paper be careful that there are no particles of dust or other matter flying about in the room.

3. Use a strong nitrate bath, and after having sensitised one piece of paper agitate it before placing another upon it. If this be omitted the bath will become turbid, for the reasons mentioned by Mr. Lyte. The nitrate of the base of the chloride in the paper will remain upon the surface of the bath and dissolve out the chloride before it is decomposed.

4. Dry the paper by artificial heat as quickly as possible, to prevent the free nitrate—which is so essential to the production of brilliant prints—sinking into the paper. Of course a quarter of an hour or so must elapse before placing it in the printing-frame.

5. After printing wash very rapidly, and then soak before toning.

6. Only use the hypo. bath for one day, as a curious compound appears to be formed in it, which rapidly eliminates the sulphur. Although I only use my hyposulphite once, I do not waste it: as it is used I throw it into a large jar, and when a sufficient quantity is obtained, I evaporate it down to saturation. I then add a little acetic acid, allow it to stand for twenty-four hours, filter it, and employ it for fixing negatives. I dare say this will appear a great deal of trouble, but I do not find it so in practice.

My last caution is:—Wash the proofs quickly after fixing. The whites will be kept much purer by it.

I do not think I have anything else to mention, and I hope that in what I have said I have not proved tedious; but, should any question occur to you, I shall be most happy to give any information in my power.

[The paper was illustrated by a large number of well-executed specimens, very artistically printed, and having an effect similar to the best upon plain paper.]

THE COMMERCIAL ASPECTS OF PHOTOGRAPHY.

By Stephen Thompson.

It is well for the onward traveller occasionally to pause and review the ground over which he has traversed: to stop and reflect—

"And gaze upon the distant vale below:"

to "look before and after," and see whither leads the path he is pursuing: to consider whether it is the right path—the best path—or whether he is not diverging into dubious ways which end in undesirable terminations.

The above should be the attitude of photography. It is long since it crossed the *pons asinorum*, and entered on the broad champaign which lies stretched before it. It remains to be seen whether it will ever climb the fabled mount or penetrate that charmed circle so jealously guarded, and be welcomed as an equal, instead of being coldly received as a *parvenu* or intruder.

There are certain aspects presenting themselves in this stage of the journey which ought to make every one interested in the progress of photography consider whether we are in the right track, or whether we are not drifting into the slough of a base money-grubbing spirit which is the death of all progress towards a desired end. It is a melancholy fact, yet undeniable, that there is an amount of knavery and charlatanism practised in the commercial photographic world—beginning with the manufacturers, or rather sellers, of rubbishy lenses, apparatus, and materials, up to the showy, *soi-disant* first-class (heaven save the mark!) house—which is absolutely astounding.

Photographers—or rather those practising photography—may, with tolerable ease, be pretty nearly reduced to *three* classes. To begin with the lowest: there is the class which has been justly termed by the journals and daily press "the photographic nuisance"—the Arabs, the Pariahs of the profession, who prey on garbage, and infest the less reputable quarters of the metropolis and great provincial cities in daily increasing numbers—coarse, vulgar rogues who "hold out" in filthy dens, backed by an *entourage* of tawdry finery and atrocious specimens, yet attended by an even still lower variety of the human species—the touter or doorsman. Ruffianism and blackguardism may there be found in its most repulsive phase. A class that has been honoured by a graphic leader in a popular morning paper scarcely needs any farther *exposure* from us. We will not, either, venture upon any *intensification* of the picture there presented. Would that the public also would withhold the necessary *preservative agent*, without which it would soon be in a state of *double decomposition*.

It is pleasant to turn from this dismal spectacle to another class—the regular professional photographers in both portraiture and landscape art—who have no more *affinity* with either of the others than the regular medical practitioner has with quacks and charlatans. It may be said they number in their ranks men of the highest attainments, governed by refined principles of honour and integrity: men of varied gifts and acquirements—some highly educated—all possessed of a high degree of intelligence; for photography has no permanent place for other than such as these. It is to them and to distinguished amateurs that we owe the past progress and present position of photography in this country. Each and all of them can tell of years of weary labour, and perseverance amidst mortifying failures, when the photographic highway was not so well macadamised as it now is. In them have the bewildered aspirant and the dainty *dilettanti* ever found willing guides; and the services they have rendered to science, art, education, and civilisation are almost incalcuable.

There is yet another class quite distinct from either of the foregoing, the individuals of which are reaping much of the reward due to those who have borne the heat and burden of the day—we allude to the photographic tradesmen or capitalists, who are not photographers at all. Yes: photography has its

Barnums and its Moses and Sons. Another fungus has sprung up like tares amidst wheat; for where the carcase is, there will the vultures—the most ignoble and rapacious of birds—be also. A number of establishments have started into existence during the last few years in which acts are daily perpetrated, and a system carried out, which cannot fail to deeply injure photography in the estimation of every well-regulated mind. Unfortunately, not belonging to the photographic brotherhood themselves, the proprietors of such concerns feel no *esprit du corps* nor pride in preserving the position of photography. Such establishments are generally carried on under some generic title which cloaks all individuality. These firms hold much the same position in the trade with regard to their *employés* as what are termed "sweating houses" do to the slop-trade. Every one is under-paid and over-worked on the one hand, and the public over-charged on the other, and thus profits are made at both ends. Photography is pursued less painstakingly (as it should be) than commercially. We admire commercial enterprise, pursued on honourable principles—within certain limits it is legitimate enough; but when it over-steps those limits it becomes a matter for execration, fraught with mischievous evils of the direst kind. The extraordinary feature is, that the conductors of journals, otherwise honest enough, can be found to bepuff them: this can only be accounted for on the ground that, being first befooled themselves, they unwittingly befool the public.

It may be urged that people do not go twice to puffing drapery and other concerns when once taken in. With regard to such photographic concerns, it may be said that they often do not go again anywhere. They perhaps first of all go to some third-rate place, and, the result being unsatisfactory, they think justly "I will go higher," but too often they are guided in their selection by specious advertisements, and go in large numbers to some showy, puffing, *quasi* first-class house—and there are many such—and thus are again "sold:" then they think they have some idiosynocrasy which prevents their ever making *good portraits*—a very common notion—and give it up, and thus the commonwealth of photographers suffers. It behoves every photographer to enter a vehement protest against all practices tending to degrade the art. We are quite obtuse to any moral distinction between lying and cheating and picking and stealing, except that the first is the more ignoble and cowardly of the two. We know of no greater antithesis to such work than the labour and care and pains—to say nothing of higher qualities—bestowed upon such productions as Mr. Robinson's *Bringing Home the May*.

To the public it may be said—Avoid alike the low den and the gilded saloon, the touting of which is done through the advertising columns of the daily press: neither belong to the legitimate photographic guild. All these are but the camp-followers—the sutlers—who follow in the rear of every advancing army, looking for plunder or "loot"—not too particular whether from friend or foe.

To photographers it may be said—Let every one do that which within him lies to broaden the line of demarcation between himself and such as these. Let each one consider he has a public duty to perform to the whole brotherhood, to which sometimes private interests should give way. There is nothing more astonishing than how much may be done by individual efforts. Every public movement almost has been brought about by the force of individual minds exercised on the mass. Let none ever degrade his art by applying it to improper purposes. Cultivate still higher conceptions of its dignity and purposes, and a vehement intolerance and scorn and contempt for low trading tricks of all kinds. It is only by making the distinction between themselves and those described more unmistakeable that any good can be done—always remembering that

"They who would be free,
Themselves must strike the blow."

Art Union of Glasgow.—The Council of this Association have resolved upon presenting their subscribers with three photographs, copied from three paintings expressly executed for this purpose. Noel Paton being entrusted with the execution of one, wisely finished it in monochrome; but Messrs. Sant and Millais, who painted the other two, made finished paintings in colours. Mr. Annan, whose exquisite landscape photographs are so widely known and admired, was chosen to reproduce these, and has done his work in a very masterly manner. The subjects are *The Death of King Arthur*, by Paton; *The Better Land*, by Sant; and *The White Cockade*, by Millais. As our readers are likely to become familiar with these pictures, we refrain from describing them more fully.

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.*

By Emerson J. Reynolds.

SPECIAL RE-AGENTS.

Sulphate of Potash.—Dissolve one part, by weight, of the crystallised commercial salt in two hundred parts, by measure, of water. This solution contains in equal volumes the same quantity of sulphuric acid as a saturated solution of sulphate of lime.

Phosphate of Soda.—This salt should give no precipitate with ammonia. Dissolve one part, by weight, in ten parts, by measure, of water.

Oxalate of Ammonia.—The commercial oxalate is always sufficiently pure. Dissolve one part, by weight, in twenty parts, by measure, of water.

Acetic Acid.—Dilute one part of *glacial* acetic acid with eight of water.

Chlorate of Potash.—This salt is kept in the dry state.

Cyanide of Potassium.—The cyanide used should be of a milk-white colour, and perfectly free from iron. Dissolve one part, by weight, in five parts, by measure, of water. This solution should be made as required.

Chromate of Potash.—This salt should contain no sulphuric acid. To test for this we add some hydrochloric acid and chloride of barium to a solution of the salt: if a white precipitate be formed sulphuric acid is present. Dissolve one part, by weight, in eight parts, by measure, of water.

Carbonate of Silver.—This is best prepared by cautiously precipitating nitrate of silver with carbonate of ammonia. The precipitate is allowed to subside, and then repeatedly washed, by decantation, by which means it is freed from the ammoniacal salt. It is preferable to preserve it in the moist state, since chlorine and chlorides more readily decompose it when in this condition.

Bitartrate of Soda.—In order to prepare this salt we dissolve two ounces, by weight, of the crystals of tartaric acid in six ounces, by measure, of water, then divide the solution into two equal parts; now neutralise one portion with pure bicarbonate of soda, thrown into the solution in the solid state, and when exactly saturated add the second part of the acid solution, then evaporate the mixture until crystals begin to form; when this point is reached add half a fluid ounce of water, stir well, and allow the solution to cool completely; then, even if any more crystals have formed, pour off the mother liquor and preserve in a stoppered bottle. Solutions to which this test is applied should always be neutral or slightly acid.

ANALYSIS OF THE BASIC GROUPS—*(continued)*.

Having accompanied us so far on our path, we must now ask the reader to accept our guidance while we initiate him still further into the art and mystery of qualitative analysis. In our last paper we had successfully completed a searching analysis for all the constituents of the first two groups. Let us now take up the subject where we left off, and endeavour to complete our examination for all the remaining bases in the present number.

Third Group.—The members of this class are precipitated by the general re-agent—sulphide of ammonium in an alkaline solution—in two conditions, as sulphides and oxides. The precipitate must be washed rapidly and well with water, to which a few drops of sulphide of ammonium have been added, and then with pure water: this must be done very quickly, since the precipitate is peculiarly liable to oxidation. While still on the filter, pour *dilute hydrochloric acid* over it. If *nickel* or *cobalt* are present they will remain on the filter as a black residue, in consequence of the sulphides of these metals being insoluble in the cold dilute acid. We must now take into consideration two points—first, the colour of the precipitate; and, secondly, whether sulphuretted hydrogen is evolved on treating with the acid. If the colour be dark, and the odour perceptible, all the remaining sulphides may be present: if greenish-white, and no sulphuretted hydrogen is given off, the precipitate consists merely of oxides. Again, if it be white, but the disagreeable smell of rotten eggs is perceived, *zinc* is probably present.

We now have to examine the black residue and the acid filtrate. Suppose we take the former to begin with.

Divide the residue into two portions. Examine one part as to the colour which it imparts to borax when fused before the blowpipe in the manner to be hereafter described. If a blue colour be imparted to the bead of borax, *cobalt* is present. We now take the second portion and dissolve it in hydrochloric acid, to which a few drops of nitric acid have been added. Now boil, to expel as much

* Continued from page 366.

acid as possible, and then add a solution of *cyanide of potassium* until, if any precipitate be found, it is re-dissolved. Now pour in excess of *sulphuric acid*, and allow the mixture to stand some time: if, after allowing it to rest, a greenish precipitate be observed, *nickel* is present.

Having disposed of the residue, we next turn to the filtrate. This latter is an acid solution, which may contain manganese, iron, zinc, uranium, chromium, and aluminum. We now add a few grains of *chlorate of potash*, and boil; then pour in excess of *caustic potash*, and agitate well. If a precipitate be produced, it is allowed to subside, and the clear supernatant liquid preserved for examination. The precipitate is then washed and set aside. For the sake of clearness we will call the solution No. 1 and the precipitate No. 2. We will now test No. 1.

No. 1.—Place it in a test-tube, and boil for some time. If a greenish precipitate form, *chromium* is present:* this is allowed to subside, and the clear liquid decanted. Through the latter we now pass sulphuretted hydrogen. If a white precipitate be produced, *zinc* is present. Now filter or decant, and neutralise the filtrate with a slight excess of hydrochloric acid, and finally add *ammonia*. The production of a white precipitate indicates *alumina*. So far so good. Let us now examine the precipitate produced by caustic potash: this may consist of the oxides of *manganese*, *iron*, and uranium.

No. 2.—Dissolve in hydrochloric acid, using an excess, and add *ammonia*. If a precipitate be produced, filter, and pass *sulphuretted hydrogen* through the filtrate, or add a few drops of *sulphide of ammonium*. If a fine flesh-coloured precipitate be produced, *manganese* is present. Now wash the precipitate thoroughly with water, and then digest with a strong solution of *carbonate of ammonia*, and filter. If the filtrate have a yellow colour, and gives a pale yellow precipitate on boiling, *uranium* is present. The brown residue is now dissolved in a little hydrochloric acid, and a solution of yellow prussiate of potash added. If a precipitate of "Prussian blue" be formed *iron* is indicated. Such is the simplest mode of analysing the third group.

In the following table we give our usual epitome of the method to be pursued:—

Pour dilute hydrochloric acid over the thoroughly-washed precipitate.

<table>
<tr><td colspan="2">A black residue indicates cobalt or nickel, or both.
Divide in two portions.</td><td colspan="4">Filtrate.
Add a few grains of chlorate of potash, boil, and then add excess of potash.</td></tr>
<tr><td>1.
Fuse with borax in flame of blowpipe. A blue bead is formed.
Cobalt.</td><td>2.
Dissolve in a mixture of nitric and hydrochloric acids; then test with cyanide of potassium as directed. A greenish precipitate is formed.
Nickel.</td><td colspan="2">Filtrate
may contain oxides of zinc, aluminum, and chromium.
Boil strongly.</td><td colspan="2">Precipitate
may consist of the oxides of manganese, iron, and uranium.
Dissolve in considerable excess of hydrochloric acid.
Add ammonia, likewise in excess.</td></tr>
<tr><td colspan="2"></td><td>Filtrate.
Pass sulphuretted hydrogen.</td><td>Precipitate
sesquioxide of chromium.</td><td>Filtrate.
Add a few drops of sulphide of ammonium. A flesh-coloured precipitate is formed.
Manganese.</td><td>Precipitate
may contain sesquioxides of iron and uranium.
Digest with strong solution of carbonate of ammonia and filter.</td></tr>
<tr><td colspan="2"></td><td>Filtrate.
Neutralise with hydrochloric acid, then add excess of ammonia.
A bulky white precipitate.
Alumina.</td><td>A white precipitate.
Sulphide of zinc.</td><td>Filtrate.
Has a yellow tint. Boil.
A light yellow precipitate is formed.
Uranium.</td><td>Residue.
Dissolve in hydrochloric acid; test with yellow prussiate of potash: the formation of a blue precipitate indicates iron.</td></tr>
</table>

Fourth Group.—As we have already mentioned, the three constituents of this group are thrown down as carbonates by the general re-agent. In order to analyse the precipitate, we dissolve it in dilute *acetic acid*, and place a small quantity of the acid liquid in a test-tube; a few drops of the test solution of *sulphate of potash* is then added, and the result observed. If no precipitate be produced *immediately*, *baryta* is absent; but if, after allowing some time to elapse, and frequent agitation of the mixture, a white precipitate be observed, *strontia* is present. If strontia be absent, we add ammonia and *oxalate of ammonia*, and then warm: the formation of a white cloud indicates *lime*. Supposing all the members of the group are present, we must adopt the following course:—To the acetic solution add *chromate of potash:* a pale yellow precipitate of *chromate of baryta* is produced, which must be separated by a filter: to the filtrate add ammonia and *oxalate of ammonia*. If a precipitate be found, it may consist of both strontia and lime. This must be collected on a filter, and well washed. A hole is now made in the apex of the filter carrying the precipitate, and the latter washed down, by means of a fine stream of water,* into a small porcelain crucible held beneath to receive it. The crucible and its contents are now placed over the spirit-lamp flame, until all the water has evaporated. The dry residue is then heated strongly for about a quarter of an hour, and allowed to cool. We next dissolve it in a few drops of hydrochloric acid, and again evaporate gently to expel the excess of acid: then dissolve the saline mass in water, and filter, if necessary. The solution may contain *lime* and *strontia*, to separate which we now add solution of *sulphate of potash*, then agitate well, and leave at rest for some time. If a precipitate be produced, *strontia* is present. Should the latter be the case, pour in some *dilute* sulphuric acid, and leave the mixture at rest for a couple of hours, in order that all the strontia may be thrown down: then filter, and add excess of ammonia and *oxalate of ammonia*. The immediate formation of a white precipitate indicates *lime*.

Fifth Group.—We have now arrived at the last of our useful though certainly not artistic "groups," and would remind our readers that the members of this class are not precipitated by any general re-agent, but consist merely of magnesia and the alkalies. Before going any further, we must ascertain whether magnesia be present or not in the solution under examination. For this purpose we add a solution of *phosphate of soda* to a small separate portion of the liquid, and allow the mixture to stand for some time. The formation of a white crystalline precipitate indicates *magnesia*. If magnesia be absent, we simply evaporate the remaining liquid to dryness, and ignite gently until all ammoniacal salts are expelled: then dissolve in water, and test for the alkalies as directed below. If the earth be present, we must proceed as follows:—Add excess of hydrochloric acid, and evaporate to dryness; then ignite for some time. When the dry mass is cool, pour some water over it, and then boil with some *carbonate of silver*, until the liquid has a strongly *alkaline* re-action; the boiling must be continued for about ten minutes with constant stirring, and the solution filtered while hot. The filtrate is acidulated with hydrochloric acid, and then evaporated to dryness. A small portion of the dry mass is then held in the flame of the lamp on a piece of platinum wire: if a fine *crimson* colour be produced, lithium is certainly present (the presence of soda salts prevents this re-action); a *yellow* tint indicates sodium and pale *violet* potassium. The remaining mass is now dissolved in a very small quantity of water, and the solution divided into two portions.

1. Add solution of *bitartrate of soda*, and agitate well: if a white crystalline precipitate of bitartrate of potash, or "cream of tartar," be produced after a little time, *potash* is present.
2. Place this in a watch-glass, and add a few drops of solution of *phosphate of soda;* then evaporate to dryness very gently over a lamp. Now treat the dry mass with water. If a white residue, insoluble in water, remains, it consists of basic *phosphate of lithia*, indicating the presence of that metal.

The presence or absence of *soda* is inferred from the colour imparted to the lamp flame, since there is no safe precipitant for soda.

It now only remains to test for *ammonia* in the original solution. This is done by placing a little in a test-tube, and adding caustic potash solution in excess, and warming the mixture: the volatile alkali is at once given off, and may be easily recognised by its pungent odour. If any uncertainty exist, however, it may be set at rest by holding a glass rod, moistened with strong *acetic acid*, at the mouth of the tube; if white fumes are produced, there can be no doubt of the presence of ammonia.

HINT FOR COLOURISTS.—It is frequently objected to photographs which have been partially tinted in water-colours, that while the coloured portions are dead and dull the uncoloured are glossy, and that this does not appear pleasing. To avoid this a solution of isinglass in spirits of wine (about 5 grs. to the oz.) may be passed over the print when tinted.

* Sesquioxides of iron and chromium, when in company, affect their respective reactions according to their relative quantities. If a very large amount of sesquioxide of chromium be present, small quantities of sesquioxide of iron dissolve completely in potash, and *vice versâ*. Both oxides may, however, be easily separated on fusion with *nitrate of potash* and *carbonate of soda*. The mass is treated with water, which dissolves out chromate of potash, which is recognised by giving a yellow precipitate with a solution of *acetate of lead*, leaving a residue of brown *sesquioxide of iron.—Will.*

* The wash-bottle described in Dr. Monckhoven's article (No. 173) is particularly useful in this and similar cases, more especially if the end of the tube through which the water is ejected be drawn out to a fine point in the flame of the spirit lamp.

PRINTING, TONING, AND FIXING OF DIRECT POSITIVES ON ALBUMENISED PAPER.*

By Professor Towler.

Ammonio-nitrate of silver is more sensitive to light than nitrate of silver, as is also the chloride of silver produced by double decomposition with ammonio-nitrate of silver and any of the alkaline chlorides: it produces more vigorous pictures, and sensitises the paper more quickly, than the simple nitrate of this metal.

2. These are three very important qualities in photography: it has, however, its disadvantages or difficulties, which are the following:—free ammonia easily dissolves the albumen from the surface of the paper, whereby the solution becomes discoloured, forming albuminate of silver. This deteriorates the effectiveness of the solution for future operations: the paper is reduced again to plain salted paper, and the picture is mealy, imperfect in the middle tones, and possesses but very little vigour.

3. The question, therefore, arises—how can the ammonio-nitrate process be modified so as to obviate these disadvantages? I have experimented with various reagents, such as ether, hot water, acids, &c., and have selected, as successful in a high degree, the following method, by which the albumen surface is preserved entire, the tone is a rich purple-black, all mealiness or snowiness avoided, and uniformity of action maintained.

SILVER BATH.

4. Dissolve one ounce of nitrate of silver in six ounces of rain water: of this solution take two ounces, and add ammonia until the precipitate is redissolved; afterwards mix these with the remaining four ounces. Now add four drachms of *alcohol*, and allow the oxide of silver to settle. If any particles still swim on the solution remove them by drawing a small sheet of paper two or three times over the surface. It is not necessary—it is even injurious—to filter the solution; for the sediment is oxide of silver, which is afterwards dissolved by the addition of ammonia.

The paper, already cut and prepared according to art, is made to float on the silver for about ten seconds; all bubbles and particles that may adhere are carefully removed from its surface; and afterwards it is dried in the usual manner. Every time this bath of silver is again used fresh crystals of the nitrate are added, together with a few drops of ammonia, and about one drachm of *alcohol*.

TONING.

5. The prints are first well washed in several waters. This operation may be performed in ten minutes or a quarter of an hour: if the time be much longer, the tone is impaired. They are then passed through hot water previously to their immersion in the toning solution. This solution is formed as follows:—from the stock-bottle, containing one part citrate of soda and six parts water, take two ounces: to this add one pint of warm water, one ounce of rain water holding in solution one grain of chloride of gold, or more, according to the number of prints to be toned, and two drachms of *alcohol*. The toning soon commences, and is soon finished if the gold be in sufficient quantity. The temperature must be preserved at a blood-heat, or about 100° Fah. If it were greater the gold would become decomposed, and the solution blackened instead of the prints; if lower, the time of operation will be prolonged and the operation itself tedious. The alcohol in this solution prevents all action of the alkali on the albumen, whereby the vigour of the print is preserved. I do not use the same bath twice unless immediately, and then of course with the addition of more gold. After the toning is finished any gold that may remain is reduced by sulphate of the protoxide of iron, and collected.

FIXING.

6. The fixing medium consists of the ordinary solution of hyposulphite of soda. Every time I use this bath I add fresh crystals of the salt, two drachms of *alcohol*, and an ounce or two of warm water, so as to raise the temperature. The prints, previous to their immersion in this bath, are again passed through warm water. The colour of the prints is not much changed when the prints are introduced, or, if slightly changed, they soon regain their original and final tone. In two or three minutes the prints will be sufficiently acted upon by the hyposulphite, and are then removed into the water bath and thoroughly washed. The material point in these operations is the use of alcohol in each subdivision, because upon this reagent success depends. Carbonate of soda may be used instead of citrate in the toning solution; the tone, however, is a richer purple-black with the latter than with the former.

I would finally remark that unless the negative be properly and successfully taken with due contrast of light and shade, and without a universal fogginess over the whole surface, deep purples or blacks can never be obtained by any process; the silver salt has to be thoroughly acted upon by light in order to receive the desired toning.

* From *Humphrey's Journal*.

ON THE NOMENCLATURE, THEORIES, AND PROPERTIES OF SALTS.

By James Martin.

The above title may, perhaps, lead many of our readers to anticipate a paper of a very abstract and unpractical character, and the propriety of introducing subjects of such a nature into a Journal devoted to so eminently practical a science as photography may seem to them somewhat questionable. The writer, however, ventures to think that this opinion will not continue to be entertained after the perusal of the matter now brought forward, since it is his object to communicate such information as shall prove of daily practical value to those photographers who have been unable to acquire chemical knowledge by actual experience in the laboratory.

While the advantage of such knowledge in the practice of photography is very generally admitted, regret is frequently expressed by enthusiastic amateurs at their deficiencies in this respect; and the present article is undertaken with the hope of supplying, in some measure, a remedy.

It is conceived that this object will be best attained by introducing such facts as have (if the expression may be permitted) a generalising tendency; and if, for the sake of making this point clear, an instance be taken as an illustration, it will be seen that in a fact like this—*all acetates are soluble*—we have a statement which, applied to any *acetate* coming under the notice of the photographic amateur, acquaints him at once with *at least one* of its chemical characteristics, viz., its solubility in water.

The facts brought together in the present paper are gleaned mainly from notes of readings made by the writer some years ago; and, while fully sensible that some new opinions have been recently advanced on the theory of the constitution of salts, he has, nevertheless, deemed it not unadvisable to lay the matter before the readers of The British Journal of Photography in its present form, reserving to himself the pleasure of returning to the subject on some future occasion, when he hopes to give a short paper on the proposed new nomenclature of Gerhardt.

To begin, then, at the beginning:—

The word salt was formerly confined to chloride of sodium, or common salt—a substance that has been known and in use from the remotest ages.

It was afterwards generalised by chemists, and employed by them in a very extensive but not very definite sense. All bodies which were easily melted, soluble in water, and not combustible, were called salts. At a later period, the term salt was restricted to three classes of bodies—namely, acids, alkalies, and the compounds which acids form with alkalies, earths, and metallic oxides. The first two of these classes were called simple salts, and the salts belonging to the third class were called compound or neutral. This last appellation originated in an opinion formerly entertained by chemists, that acids with alkalies, of which they (the neutral salts) are composed, were of a contrary nature, and that they counteracted each other; so that the resulting compounds possessed neither acid nor alkaline properties, but properties of an intermediate character. It will be remembered that, although this opinion is partly true, it is not entirely so, as there are salts formed by the union of acids and alkalies in which both properties sometimes preponderate. As an example of an *acid* salt, take bisulphate of potash; while phosphate of soda affords an illustration of an *alkaline* salt.

Chemists of the present day only apply the term salt to a compound formed by the union of an acid or electro-negative body with a base or electro-positive body. These salts they divide into two classes, namely, *haloid salts* and *oxy-salts*, the nature of which will be unfolded in the course of the present paper.

As every salt is composed of an acid and a base, and as there are a great number of acids and bases, it has been considered necessary to divide salts into classes. The salts formed by an individual acid, with all the different bases, give rise to a genus or class, and may be distinguished by a generic name, expressive, in some part, of their composition.

The generic name is taken from the acid. The combinations of sulphuric acid, for instance, with *any* base are called sulphates; of phosphoric acid, phosphates; and so of the rest. The name of the individual salt is derived from that of the base. Thus, when we have a salt, formed by the combination of sulphuric acid with potash or soda, it receives the name of sulphate of potash or soda, and implies the continued existence of sulphuric acid and potash or soda, in the proportion of one atom of each constituent.

But acids and bases have the property of combining in other proportions than that of one atom of each; and, to distinguish

these salts from those just mentioned, it is necessary to employ some other epithet. And to this end, *when the acid is in excess*, chemists prefix the Latin numerals to the generic name. Thus, when we have a combination of one atom of a base to one and a-half, two, or three of sulphuric acid, it is called a *sesqui*-sulphate, *bi*sulphate, or *ter*sulphate. But when the *base* is in *excess*, the *Greek* numerals are prefixed; for instance, when we have a combination of one atom of nitric acid with two or three of base, it receives the appellation *di*-chloride or *tris*-nitrate.

Besides these names we have others which, unfortunately, indicate only the *relative* composition of the salt to which they are appended. They should, therefore, never be employed when it is possible to use those of a more defining character. The following are instances of the kind of prefixes alluded to:—*Proto* and *per*, which indicate the lowest and highest proportions in which two bodies combine; and *sub* and *super*, prefixed to the generic name, to show that the number of atoms of acid is inferior or superior to that of the base.

In no part of chemistry is the advantage of the new nomenclature so sensibly experienced as in the class of salts, for the number of these compounds is somewhat astonishing, and if the knowledge of the name did not lead to that of the compound, scarcely any memory would be adequate to retain a knowledge of any of the properties, or an idea of the composition of the bodies so designated; but, by changing the arbitrary titles formerly assigned to them for names expressive of their composition, we are furnished with a kind of artificial memory, which renders their recollection perfectly easy. Thus, for the terms "butter of antimony," "sugar of lead," and "Glauber's salts," are now substituted the more appropriate titles of "sesquichloride of antimony," "acetate of lead," and "sulphate of soda."

It will be remembered that the term salt was originally applied to chloride of sodium, and afterwards extended to other bodies possessing properties somewhat similar to the original type; but, after a time, it was found that salts were produced by the combination of acids with alkalies, or, at least, by bringing them together; and as sea-salt was obtained when soda and muriatic acid were mixed, it was supposed to be formed of these constituents, just as sulphate of soda was supposed to consist of sulphuric acid and soda.

But when, in process of time, it became known that sea-salt contained neither muriatic acid nor soda, it became necessary, since it was impossible to deny the claim of sea-salt to rank as a salt, to admit two kinds or classes of neutral salts. These are the classes to which allusion has just been made—one formed by the union of an oxygen acid and an oxygen base, the other by the union of a salt radical and a metal. Thus, while sulphate of soda is expressed by the symbols $Na\,O,\,SO_3$, the composition of sea-salt is indicated by the symbols Na Cl—the former corresponding to the hydrated acid $H\,O\,SO_3$, and the latter to the hydrogen acid H Cl. This, indeed, is the view which has for many years prevailed.

(To be continued).

A Vision from Aspromonte.—We have received from Mr. Rejlander another rendering of the subject which we noticed in our last issue. The more recent production is an improvement as regards composition. The wounded warrior is seated, and in a much less constrained attitude than in the former picture, while the female figure, representative of Hope, leans over him, and, with a gesture towards Rome, indistinctly visible in the distance, appears to revive his drooping spirits. There is a bit of sly humour, for which Mr. Rejlander has a *penchant:* the distant seat of St. Peter appears obscured by a sombre shadow that takes the shape of a well-known chin and "imperial," we might even say an imperial chin. The composition is, in our opinion, decidedly superior to that of the previous illustration. We were rather more than surprised last week at finding the following in the pages of the *Athenæum*, with reference to the above-named photograph:—

"Mr. O. G. Rejlander is a good manipulator, and we have sometimes found ourselves able to praise his photographs; but he must be told, in very plain words, that the English public will not tolerate his tricks. He must not try to pass, as portraits of Garibaldi, studies from an artist's model, paid for playing the hero of Marsala at fifteen-pence an hour. The *Vision of Aspromonte*, now in the shop windows, is a nuisance. The woman is not an Italian. The man is not Garibaldi. The drapery is indecent, and the composition is in bad taste."

The writer of the preceding must surely have suffered something which has stirred his bile. What led him to think that any *fraud* was intended? The very title precludes such an idea. It does not profess to be a *portrait* of Garibaldi; and we unhesitatingly affirm that the "indecency" of the woman's drapery exists only in the imagination of the bilious critic.

A VISIT TO LONDON AND THE EXHIBITION.*

By A Scotch Photographer.

Photolithography is well represented in the Exhibition. In one department of this branch—that of the reproduction of photographs of natural subjects—little advance has been made; but in the reproduction of such subjects as engravings, nothing more can be desired. The works of Ramage, of Edinburgh, show what can be achieved in this direction. I may state that the friends of this gentleman have the good sense to pay no attention to the *inuendo* contained in a recent editorial article of a contemporary, which, although not extensively circulated in this quarter, yet doubtless possesses some authority in the eyes of its readers. From this article, which is on the subject of the forgery of Bank of England notes by means of photolithography, it would seem that a person possessing the ability of Mr. Ramage is almost a dangerous character to be abroad among society. True, says the writer, Col. Sir Henry James and Mr. Osborne could reproduce bank notes quite well if they were so inclined, but we know them to be honourable gentlemen, who would not perform so disreputable an action. This in substance is the language employed. Now, having specified by name these two gentlemen as being too respectable to use their powers in a fraudulent manner, on what principle, may I ask, is the name of Mr. Ramage dragged in among those who *may* so prostitute their talents? Mr. Ramage can well afford to dispense with praise awarded to him at such a price. It is quite true that his photolithographs are the best in the Exhibition; but it is no less true that he is as incapable as either Sir Henry James or Mr. Osborne of turning his skill into questionable channels.

The carbon prints in the Exhibition are interesting from a scientific point of view, but very much inferior to what I expected to see.

As the country visitor to London loses much if he neglect to visit Sydenham, so the loss of the visitor to the Exhibition who neglects visiting the machinery department is very great. I was about placing on record my conviction that photography, so far from being *degraded* by ranking in such company, might have considered itself honoured had the original arrangement been carried out in this respect; all this and much more I *might* have said, and said truly, too, but a dread of the sledge-hammers of the Editor and the art-critics of The British Journal of Photography deters me—not that I have any objection in the least to get my "jacket dusted" in a good cause, but from want of time to enter the arena. I confess to *thinking* a good deal of treason with respect to the claims that photography has to be considered a fine art; but as I am not now going to *write* it, no harm will be done.

That I am not alone in these opinions, the following advertisement from the *New York Herald* of the 2nd Sept., will attest:—

Photographers.—Wanted, an experienced *workman* to make negatives * * * * * * * Apply, &c.—

It is altogether impossible for a reader of a photographic serial to visit London and not feel some degree of interest about the owners of those names he from time to time meets during a perusal of its pages. The Editor of The British Journal of Photography, to whom in no small degree I was indebted for the pleasure I experienced from my visit to the south, kindly submitted to my inspection an album full of many mighty men of renown in the art, and it must have been amusing to him when, in answer to his oft-repeated question, "And who do you say *this* is?" to hear the blunders—alas! in every instance—which I made. Nor is it to be wondered at that I failed in guessing. Who that was not previously aware of the man's *personale* would, when shown a portrait of a gentle-looking young man of mild and thoughtful demeanour, his nose surmounted by spectacles somewhat larger in size than some would consider "the thing"—who, I say, would suppose this to be Hardwich, whose genius we so admire, and by whose researches we have been so much benefited? My idea of Mr. Hardwich was that of a hard-featured and decidedly elderly man, like the present Chancellor of the Exchequer.

In many instances the contrast between my ideal and the reality was so great as almost to occasion a feeling of disappointment. Some, whom I had expected to find "scarce oot o' their teens," were of venerable aspect, and *vice versâ*. I learned that the correct pronunciation of Mr. Hardwich's name is Hard*witch* not Hard*wick*, as many in the country have contended it was. It is true there is not much in a name: still it is desirable to have its true pronunciation as far as possible—a thing which, in the case before us, the existing state of the science of phonetics would never have helped us to.

* Concluded from page 353.

No quantity of letters of introduction can favour us with a sight of a man when he is not at home, and so I missed seeing the proprietor of the familiar initials, "A. H. W." In his studio I saw, however, a portrait of the Editor of the *Photographic Notes*. He seemed to be a gentleman pretty well up in years, with a very determined kind of look in his face. I feel sure he is a much more amiable man than his portrait makes him out to be. Why on earth will people insist on looking "dour" when getting "*took*?" I am sure it would be better were a more pleasing expression thrown into people's faces generally when undergoing this ordeal. Never having seen this gentleman I cannot speak as to its correctness, of which, however, I see no reason to doubt. But I could have desired much to have seen Wall himself. In artistic matters he writes like a sage; and, although I have hitherto gone on the supposition that he is only young in years, I may be mistaken, and after all he *may* turn out to be three score and ten!

The Londoners are intensely fond of their city, and omit no opportunity of saying a word in its favour. "It is so large: the largest, you know, in the world;" and so busy. "Oh! have you seen Cheapside? and did you *ever* see such traffic?" But of all the lions St. Paul's Cathedral is the one they desire to speak most of—"it is such a size, you know." I at once yield them these matters, reserving no small amount of pity for the poor photographer who has to pourtray this last-named pet; for a passable photograph of a building alternately so smoke-stained and weather-blanched must require more than ordinary care and skill in its production.

There are few, if any, buildings about London which will repay the trouble of photographing them. In this respect it offers a marked contrast to the northern metropolis, which abounds in subjects both from historical reminiscences and architectural peculiarities well suited for this purpose. London is essentially a brick city, while Edinburgh is a freestone one. It only requires a glance at some of the magnificent houses at the west-end of London to perceive that they are composed of bricks, plastered over and ornamented with facings of stucco, or some other compound—their external surfaces being so coated with sand as to present a wonderfully good imitation of an Edinburgh house. But all places have their peculiar customs, and it is fashionable for us Edinburgh people to turn up our noses at the idea of a brick house. One thing in connexion with street photography might be borrowed with advantage by Edinburgh from London. I mean the enforcing of the Smoke Nuisance Act. I am aware of some photographers who have tried in vain to obtain certain views in the "Modern Athens"—or "Auld Reekie," as it is familiarly called by the natives—the dense volumes of smoke from some of the breweries rendering it almost impracticable. And yet, in other respects, Edinburgh is quite a model town compared with London. To make the streets as "genteel" as possible, the magistrates instituted a crusade against all kinds of street obstructions, such as ornamental lamps over private doors, the gilt lambs of the hosiers, the three balls of the money-lenders, &c., &c., culminating in the removal of the suspended watches—the time-honoured insignia of the horologers.

With the magistracy of Edinburgh dominant in London for a few weeks, most marked improvements would speedily be effected. Bennett's big clock in Cheapside would cease to obstruct the rush of the wind through that busy thoroughfare; but perhaps, as a compensation, manufacturers would be allowed to resume their old smoke-engendering furnaces.

Instantaneous street views are by no means such difficult feats in London as might be anticipated; for, in consequence of the enormous traffic, the progress of omnibuses, cabs, and other vehicles is sometimes very slow. One of the London *institutions* is a block-up of the street. I was privileged to be on the top of a 'bus near the Bank on one occasion, when, in consequence of something or other, all street traffic came to a dead stop—omnibuses, carriages, cabs, and drays, as far as the eye could reach, being motionless. O for a camera then!

Before saying good-bye to London I may state that the dialect and pronunciation of the middle and working classes are very superior indeed to those of the corresponding classes in Edinburgh and Scotland generally, where the slovenly drawl contrasts unfavourably with the piquant, smart pronunciation of the Londoners; and not less strong is the contrast between the sanitary state of the residences of the humbler classes. If London cannot lay claim to the possession of better public buildings than Edinburgh, it is a painful matter of fact that, in point of squalor and wretchedness, no place which I could see or ascertain the existence of in London can compete with the wynds and closes of the Edinburgh High Street, Cowgate, and territories adjacent thereunto. But, as I formerly observed, if they are bad as residences for human beings (and there can be no worse), they at least make capital subjects for photographs.

With these remarks I bid London good-bye.

PHOTOGRAPHIC ILLUSTRATIONS OF INDIA.

We have, by the kindness of Captain A. N. Scott, just had the pleasure of looking over a series of one hundred photographs of his own production, some of which we have already criticised as stereographs in former numbers of this Journal. The present series consists of a collection mounted in a thick volume, one picture only from each pair of stereographs being mounted upon plate-paper, and bound alternately with a letterpress description of the subject delineated. The latter was written by Mr. Charles R. Weld, a gentleman evidently conversant practically with the scenes described, and as evidently not conversant with the editorial functions—a matter of comparatively no importance however in the case before us, whereas familiarity with the scenes delineated is of moment. The various subjects embraced consist of scenery and antiquities at Golconda—various tombs and temples—architectural and other views at Hyderabad, Secunderabad, and their vicinity—all of considerable interest, especially those illustrative of a native street bazaar, and an interior of the residence of one of the native grandees. But even still more attractive, in our opinion, are the representations of English life in India and also of native character—the last two classes forming two-thirds of the whole collection.

Captain Scott's skill, as a photographer, is considerable; and, though the specimens are by no means free from defects—generally those of under-exposure—it must not be forgotten that, in such a climate as that of India, it requires more than common energy to work at all, and much more than common skill to attain to an excellence that may be regarded as ordinary in more temperate climates.

Bits of Chat.

A CHAT OVER A BUNDLE OF CARTES DE VISITE.

I always sit down to my fortnightly task of writing for The British Journal of Photography with a great degree of pleasure. Other contributors to other journals address their readers as the invisible beings of some unknown world; but we of the photographic serials seem rather to sit down for a pleasant and cheerful hour or two with those we know and esteem—with those to whom we are united by community of tastes, feelings, interests, and pursuits.

That this feeling of ours is not the offspring of vanity—(your public scribe is too frequently but a vain little personage)—is shown by the letters and visits we receive from those to whom we have had no introduction beyond that secured to us by our pens, or from whom we receive kindly written words of encouragement and sympathy won by no other influence. From the secretaries of societies—from many of the more prominently active members of such societies—from interested readers—from photographers grateful for sundry hints—and from amateurs seeking information and advice;—from each and all of these I personally could record little instances of genial fellowship which would prove the position of contributor to a photographic journal to be a very pleasant thing indeed.

But it has its drawbacks—no earthly pleasure is without alloy. When you criticise the works of your contemporaries, certain evil-natured churls are sure to snarl ungenerously at your awards, or hint at certain selfish meannesses as the origin of them, in a way which sometimes brings the blood into your face, and makes your fingers itch for a gall-laden pen wherewith to vent your offended pride, ire, and indignation. When you point out even the most palpable of faults, it is by no means certain that some trade-influenced outcast of common-sense will not boldly insinuate that your only aim in finding such faults is that you thus, by implication, assert your own faultlessness, &c., &c. But I will not dwell on this side of the picture just now—although it is one I am sometimes compelled to look upon—but hasten to begin our "Chat."

One of the results of the communications originated in the way I have indicated now lies before me in the shape of a bundle of *cartes de visite* received at various times, in various ways, from various operators, in various parts of the country. With these I have others differently procured, selections from all of which I shall

now make use of as giving point and emphasis to my remarks about the glass-room and lighting the model. As none were submitted to me for the purposes of public criticism I shall refrain from mentioning names in connexion with any of them, and merely speak of them as illustrative of certain points advanced in my previous "Bits of Chat."

The first I take up are some specimens exquisitely full of detail and half-tint, but lacking vigour and brilliancy. I received them some months since. Here are others received last week from the same operator, quite as soft and round but far more forcible and effective. When the first were taken, his glass-room, *a very large one*, was full of diffused light entering at all sorts of angles, intersecting, confusing, and weakening the image on its way to the lens. Discovering a valuable paper, by Mr. Lachlan McLachlan, read at the Manchester Photographic Society, *On the Management of Light in Photographic Galleries*,* he gave an immediate order for a certain number of long, narrow wooden frames, which were duly covered, hinged, and so placed as to direct all the hitherto diffused and complicated light into one direction — thus concentrating and disciplining his scattered forces, and sending them all, "shoulder to shoulder," towards one object, when, without effecting the slightest change in collodion, bath, developer, or lens (which was of long focus, by-the-bye), he reached the desired result. Previously he had bobbed about the mark, hitting it fairly only now and then. He noticed that when he did hit it fairly, and got a brilliant as well as a soft picture, it was generally at a certain hour of the day when, as I pointed out to him, the descending position of the sun gave him a dominant but not too powerful light, which went direct to his sitter, and overpowered the weak diffused light which might otherwise have intercepted it.

Here are others, by a new friend of mine. In these the top-light is evidently the dominant one, and the want of force and brilliancy which exists results from the same cause. A comparatively, although not really weak, light from the side, after being reflected from the model, has to struggle through a strong light from the sky. I advised him to weaken his top-light by stippling the glass either with starch or white lead.† Here, then, we had the dominant light in the wrong place, and, I hope and think (this operator having a sufficient supply of good side-light), that his pictures will be greatly improved if he thus effects, or has effected, a more artistic balance of his lights.

Here are some pictures taken by a (to me) unknown neighbour, whose top-light (if it may be so termed) enters from the side, but at the wrong angle. The effect is very peculiar, and by no means pleasing. The shadows under the projecting features are not altogether lost, although so weakened that there appears to be *no cast shadows* beneath the prominent features. Now, as artists, we should learn to regard all our shadows simply as vehicles for expression; and, looking at cast shadows from this stand point, we most decidedly cannot afford to lose them. The most forcible realisation of projection can only be gained by the aid of well, although not harshly, marked cast shadows. To sacrifice them is a most decided mistake, and there is no getting all their best effect or expression if *the dominant light* does not fall at an angle which casts shadows beneath the projections. The operator, in this case, has evidently been ill-advised, and has hoped by doing away with his top-light to improve his productions. I am informed that he discovered the mistake not long after he began to operate in his new room; and I think it extremely probable that he did so, whatever a certain amusing writer in *All the Year Round* may say to the contrary. Sir Joshua Reynolds informs us, in his rules for effect, that the beauty of the eye is considerably enhanced by keeping the whole of the socket in half-tint;‡ and the Greek artists placed the eyes of their statues far back under conventionally-projecting brows, for the sole purpose of obtaining the same effect. The portrait painters, again, always so arrange their light as to get vigorous shadows under the brows and nose. One of the pictures now under notice is very funny. It was brought to me by a lady whose portrait it was, and was exhibited with a great show of virtuous indignation. I should argue that it was taken rather late in the day, when the sun was low; for the cast shadow of the nose, instead of being thrown down, is actually *cast up*, and the fair one's prominent feature—really a very passable affair — looks horribly like *a pug!* Another *carte* from the same source, taken nearer noon, shows the dominant light entering the room at an angle which conveys it most charmingly to the legs and boots, but leaves the head and breast to be illumined by a light of inferior power. No specimens could better illustrate the value of a good top-light—although it is "conspicuous by its absence"—than the few I have of this gentleman's. His only remedy, and it is one within his power, is to carry the glass at the one side nearer the roof than it now is, or build out so as to get a loftier side-light, in the same way in which painters manage to get a top-light in studios in which the windows are not sufficiently lofty.

Here is a magnificent little piece of artistic composition by a first-rate hand. A friend of mine, a very clever painter, although enraptured with its beauty, complained that the figure of the lady looked like the front half of her only. He could not realise the idea of walking round her, or finding space enough between her and the background to accommodate the other half-circle of her crinoline. I believe this to arise purely from the direction taken by the dominant light, which, glancing on the face and figure, wholly escaped the accessories and background, which evidently having no secondary or subordinate light to detach and bring them into relief, no accurate idea of space behind the figure was conveyed. To secure the forcible expression of relief, there is nothing like filling the space to be expressed with a certain proportion of subordinate light, which plays much the same part here that atmosphere does in a landscape. Destroy the effect of air in a landscape, and effects of relief and space fly away with it; and it is only by the consciousness of light existing between the model and the background that the feeling of rotundity in the figure is well conveyed to the spectator. In the picture before me there is an excellent dominant light, and the shadows are sufficiently luminous to destroy opacity and patchiness on the shadowed side of the face; reflected lights are not wanting, and, so far as regards the front half, the figure and face stands out famously; but there certainly is that want of space between the figure and the background which my friend pointed out, and which is by no means an uncommon defect in most of the photographs in my bundle. The front light I have recommended in my first bit of "Chat" *would* reach the background, and would tend to detach and bring out the accessories in proportions consistent with their amount of prominence. The farther the light travelled the more diffused and subordinate it would become, so that the figure being most prominent, the accessories next in prominence, and the background least prominent, each would be *harmoniously* relieved by the different degrees of light, and, while space and harmony were thus secured, each part would be prominent only in its degree of importance. The editor of a contemporary, by-the-bye, in reply to a correspondent who asks the value of my advice in this matter, seems to imply that a front light is objectionable because the eyes, to secure that enlargement of the pupil which certainly improves their expression, ought not to be turned towards the light but towards darkness. As the view of the head chosen is usually a three-quarter one, the eyes in this case would either be turned towards the shaded side of the room, which might be hung with black velvet if you thought it best, or, if looking at the camera, they would be leering round in a way neither very graceful nor particularly pleasing.

My next *cartes de visite* were taken at my own establishment, so I will say nothing of their merit, save that they ought to be very much better than they are. These illustrate the effects of reflected light. The first I take up were photographed with a white screen placed opposite that side of the model's face which was in shadow. Its effect is chiefly discoverable in the eye, and this effect is neither natural nor pleasant. * The light reflected is not strong enough to make prominent in the negative those surfaces which retire from the spectator's eye, although it had a very pretty delicate effect on the ground-glass. My assistant suggested screens covered with tin foil, which destroyed the glare of white mirrored in the eye from the white screen, and gave a more definitely marked effect of reflected light. But I soon found that this was only the case when the light it received was of a certain strength, and that on rather dull days my shadows were still lacking in detail and transparency, and retreating surfaces in shadow still but imperfectly expressed, from the absence of sufficiently strong reflected light. I then adopted the plan of the late Mr. Lacy, using light softened and subordinated by its passage through ground glass, and got those amongst these specimens which best express the value of reflected light.

Before laying down my pen I may add here that Mr. Collings—the gentleman to whose plan for cutting off from the camera all light not coming direct from the model, and also preventing the

* See page 227, June 16th.

† See paragraph "Hint for the Glass Room," in another column.

‡ "In beautiful faces keep the whole circumference about the eye in mezzotinto, as seen in the works of Guido and the best of Carlo Maratti."—*Sir J. Reynolds.*

* See "Bit of Chat" in the number for September 15th.

diffused light from weakening the image, by means of screens (see last "Chat")—has been successful almost beyond his hopes. He states that he "can now get a singularly round, vigorous image with *less than half the usual exposure.*" Mr. Collings informs me that the idea was based upon a hint thrown out to him during a conversation on this subject by Mr. Scott Archer, and promises to forward pictures taken in succession with and without the screens, a photograph of the arrangement, and also a little paper model of the same and of the glass-room. I regret that I have not these pictures also in my little bundle aforesaid; but my readers shall be made acquainted with any particulars of importance which Mr. Collings's next communication may contain. But, as I fear I am becoming tedious, for the present adieu! A. H. WALL.

ON A RELIABLE METHOD OF SENSITISING THE COLLODION.*

PREPARE the two bottles of collodion as described in the former article, and allow it to settle for a day or two until it is perfectly clear; then decant it off into two more clean bottles. Into four six-ounce bottles, marked respectively iodide of ammonium, bromide of ammonium, iodide of potassium, and bromide of potassium, put, say four times the quantity of each respective ingredient that is required for the amount of collodion. Of course each one must be dissolved in the manner described in the former article—the ammonium with alcohol and the potassium with water. Dissolve these in a porcelain mortar with only enough of each ingredient to dissolve them; then pour them all into their respective bottles, adding alcohol enough to fill the bottles, filtering in all cases. There will then be six ounces of each excitant with a certain quantity of alcohol added. If four times the quantity has been used one can easily ascertain how much from each bottle will be required to produce the requisite intensity in a given amount of collodion, viz., to add to each ounce in one bottle five grains of iodide of ammonium and thirty-two grains of bromide of potassium, and in the other bottle five grains of iodide of potassium and three grains of bromide of ammonium.

These four bottles may be set aside and secured from the light, and if the collodion should at any time vary in its action, add of the various ingredients in such a manner as will produce the various effects. And here it may be proper to add that the effects of the different ingredients are as follow:—an increase of the iodide of ammonium will increase the blackness of the negative, and not the intensity; increase the quantity of iodide of potassium and a deep dense intensity is produced; if a want of middle tints be apparent, increase the quantity of the bromides very sparingly: so that with these four bottles any degree of intensity or effect may be attained. Of course only a few ounces of each solution can be added at a time.

This adding of the excitants after the collodion is made and settled is deemed by some operators as very improper; but when the ingredients are all well dissolved and filtered, they can be added with very great benefit and with much success.

The whole process of taking negatives is fraught with a certain amount of difficulties, and he who has the most patience and perseverance will the soonest overcome them. Anyone following the foregoing directions strictly can hardly fail of ultimate success, unless he is careless in his manipulations or, what is still more unfortunate, his chemicals are impure. This latter difficulty is never overcome except by an entire change of the chemicals. The dealers in photographic goods are always anxious to supply the best quality, and only those well known should be patronised.

PLEASANT!—A photographer of our acquaintance got into difficulties with his baths; made three, one after the other, but found each a failure; had varied his samples of silver, had used extreme care in cleansing his measures, and had at last concluded that it must be the water. Called on the chemist from whom it was procured. Chemist asserted that the water was quite pure, and poured some into a glass from a vessel which stood *without a cork* upon the floor. Photographer smelt a rat. "Don't you keep that always corked?" said he. "Why, yes I do," said the chemist, carelessly; "but as my *children play here, and sometimes drop things into the bottle to hear the noise they make in falling*, perhaps they left the cork out!" We are happy to add that the photographer did *not* assassinate the chemist. May we all be preserved from similar temptation, lest our self-control should be less than his, and chemists should perish utterly from the land! Moral: go to chemists who are photographers when you want distilled water.

* *From Humphrey's Journal.*

International Exhibition.

THE PHOTOGRAPHIC APPARATUS AND APPLIANCES.*

By SAMUEL HIGHLEY, F.G.S., F.C.S., &c.

HAVING in our last article noticed the productions of those who make a speciality of the optical department of photography, we shall next give attention to the photographic cabinet-makers, and then to the houses that devote themselves to the general requirements of photographers.

The cases of Mr. Hare, Mr. Meagher, and Mr. Ottewill deserve attention; for the cameras exhibited—including stereoscopic, *carte de visite*, landscape, and portrait-room forms—are of the best class of English workmanship, and contrast very favourably with the productions of our foreign neighbours, exhibited in more favoured parts of the building; but, beyond a contrivance of Mr. Hare's for preventing the removal of the focussing-frame from the camera while the plate-frame is inserted (a matter of importance in field cameras and operating-room cameras of large size), we did not notice any novelty that had not previously been described in these pages. The arrangement we allude to is effected by giving room at the back of the camera for the united thickness of the focussing-screen and plate frame. The focussing-screen is first fixed by two *short* grooves and corresponding keys towards the front, and, after the focus has been secured, it is lifted out of its place, then fixed, by means of similar short grooves, at the back of the "frame-groove," and the plate-frame inserted. As the focussing-glass has only to be raised one inch while changing its position, it entails a very simple act of manipulation, and the contrivance is much neater and more compact than the spring arrangement introduced some time since by Mr. J. Solomon for effecting the same purpose. Mr. Hare also exhibits a plate-frame with a "roller-blind" arrangement for uncovering the plate, in place of the ordinary form of shutter, which would be exceedingly useful in cameras of very large size if it were not for the great chance of its getting out of order; for, of course, the inconvenience *is* considerable when a large shutter has to be drawn up out of a large camera placed upon a high stand—especially if the operator *is short!*

Mr. Austin exhibits some ingeniously-contrived and well-executed specimens of camera-stands, presses, &c., in metal, with mechanical adjustments; but far too costly for the requirements of photographers, when cheapness is the order of the day.

Messrs. Bull contribute a series of their well-known back-grounds and accessories; and although, as pointed out by our friend Mr. Wall, these *look* gloomy and unartistic, we must remember that "the proof of the pudding is in the eating." In photographic pictures that have been submitted to our notice, *the effect* produced is very good, *if* accessories to a portrait are deemed desirable by the person photographed; for these things are matter of taste. Moreover, it must not be forgotten that these "dodges" occupy little space in a small operating-room, are capable of much variation in arrangement, and are attainable at a small cost.

M. Bourquin exhibits one of the best forms of operating-room camera-stands we are acquainted with—of French origin, but which has been adopted by Mr. Hughes, Mr. Rouch, and others. It is worked by an archimedean screw arrangement; and the peculiar merit is this, that in working the rack up or down the operator can stop at any point, without the necessity of bringing a stop or clamp into play. Besides this, it has every necessary adjustment for the inclination of the camera, &c. M. Bourquin also contributes some very handsome albums, in imitation of Wedgwood ware, &c., and a printing-frame.

Messrs. Bland and Co. make a very good display of cameras for the wet and dry process, together with the accessories for the operating-room and for travel. Their travelling cameras are arranged so that the board that carries the lenses is reversible, to allow of the lenses packing into the interior of the camera when not in use, and the part that contains the dry-plate frames is so arranged that it can be attached or detached from the camera at pleasure, according as to whether it is to be taken in to the field for the wet or dry process. Their nitrate of silver bath is arranged so that the India-rubber flange is not separable from the clamp fitting, to avoid the chance of its being lost when *en route*. We notice that Messrs. Bland make a speciality of providing apparatus for tropical climates; but we think that all the makers whose apparatus has stood the trial of the variations of temperature of "the scientific cockloft" without warp or crack will have proved their fitness for supplying photographic apparatus for hot climates,

* Continued from page 369.

and a favourable opportunity will present itself for securing well-tested apparatus when the Commissioners confirm Napoleon's taunt, by turning the Exhibition into a huge bazaar.

Mr. F. J. Cox has a well-selected collection of apparatus and material useful to the photographer, among which we notice the following arrangements which have not as yet been described in these pages. The first is an instantaneous shutter, that allows of either a rapid or prolonged exposure being given, according to the requirements of the subject. It consists of little metal shutters attached to the *diaphragm* of the lens, consequently is placed within the lens-mount. These may be opened and shut with great rapidity, by the rotation of a spindle that is in connexion with them, and projects beyond the mount. For a long exposure a semi-rotation is given to the spindle, and the shutters are then retained in an open position by aid of a detent.

This arrangement of *instantaneous* shutter is certainly a move in the right direction, as it is placed over the *smallest* aperture that gives access of light, instead of (as in every other form of shutter in the market) over the largest; moreover, it reduces to a minimum the chance of injury to the picture through vibration of the instrument.

The other is a camera shield for taking either four *carte-de-visite* pictures, or seventeen medallion portraits one and a-quarter inch in diameter, *on one plate*. The objection to the American form of "shield" is that the moist plate is *rotated* on its axis so as to bring different portions of its surface before the aperture in the plate-frame, this arrangement consequently entails a chance of the film being stained by the silver solution meandering over the surface. This accident, however, is avoided by Mr. Cox's contrivance, as the plate is kept vertical at all parts of its circuit. It would be difficult to make the arrangement clear without a diagram.

Mr. Cox also exhibits a very portable binocular stereoscopic camera, which, with its complement of slides, weighs only three and a-half pounds; and the parts are arranged so that they cannot readily be lost, as they are kept in attachment with the camera.

Mr. T. Sebastian Davis exhibits a combined tent and stereoscopic camera, ingenious in arrangement, and intended for working the wet collodion process; but, as far as the public at large is concerned, we believe, from personal experience in such contrivances, that, on the whole, they prove more *in*convenient than convenient, and the camera portion is quite unworkable in windy weather through carrying too much sail. The parents of such offspring, can, *of course*, work wonders with them! Of the same class of tent is that of Mr. Jeffrey; but, as the advertisements say, "one trial will prove their value!"

Mr. Dancer exhibits, in Class XIII., a dry-plate camera, wherein the plates are "fished up" into position from a reservoir fixed beneath the camera by aid of a rod. Our own conviction is that simple double-backs are preferable to all such "dodges," however ingenious they may be.

Mr. Grisdale exhibits a folding camera, the frame-work being made in metal on the "lazy-tongs" principle, of which there is another example in the camera of Busch in the Prussian Court; but this method does not appear to possess any advantage over the one usually adopted for bellows cameras.

We may here take the opportunity of drawing the attention of our readers to certain instruments in the French Department that have, from time to time, been described in the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, as we shall not have the opportunity of addressing them again before the building closes permanently, while the instruments of English exhibitors that will hereafter be noticed may be inspected at their several establishments at any future time.

These instruments are:—the field camera of M. Titus Albitès; the portable laboratory of M. Anthoni; the automatic and enlarging cameras of M. Bertsch; the polystereographic camera and electric-light enlarging apparatus of Duboscq; the large camera and stand of M. Koch; and the apparatus and photographic appliances of several other exhibitors, that do not call for special notice.

(To be continued.)

ROYAL CORNWALL POLYTECHNIC SOCIETY.

[FROM OUR OWN REPORTER.]

"Bringing Home the May," &c.

FOR the last thirty years Cornubia, the "rocky land of strangers," has been enabled to muster an annual gathering devoted to scientific invention, art productions, and matters useful, rare, or ornamental. It is known as the "Royal Cornwall Polytechnic Society for the Encouragement of Science and the Fine and Industrial Arts." The late lamented Prince Consort was a Vice-Patron, and there is every reason to believe that His Royal Highness the Prince of Wales will follow his revered and regretted father's example in the patronage he will afford to one of the most promising and progressing Institutions of, perhaps, the most practical county in England—a county with which His Royal Highness, as "Duke of Cornwall," is so closely identified.

The Royal Cornwall Polytechnic Society, under the auspices of its venerable President, Sir Charles Lemon, Bart., a most distinguished patron of art, in addition to the encouragement given to science and industry, exerts itself most laudably for the success of its yearly Exhibition, and strenuously endeavours to promote the welfare and interests of its members. It has, in furtherance of those objects, closely allied itself with the "Art Union of Cornwall," and has engaged to select its prizes from the works in their collection, and pays the expense of carriage to and fro of all contributions by professional artists. Photographers will do well to bear this in mind, and they will perceive, from the subjects chosen as prizes, and enumerated at the foot of this article, that their peculiar branch is honoured and rewarded, so that many subjects remaining unsold in the studios of photographers have a favourable chance if sent to the Falmouth Institution in the month of September of each year. All necessary information can be obtained from the indefatigable and courteous Secretary, Mr. Sydney Hodges, artist, of Falmouth.

One of the greatest attractions of the recent meeting (which was held at the Polytechnic Hall, Falmouth, in September last) in the fine art department, was the exhibition of a photograph by Mr. H. P. Robinson, of Leamington, bearing the title that heads this article. More than usual interest attached to it from the highly-gifted artist having preferred sending his latest and best production to be exhibited under the auspices of a Committee and Secretary alike distinguished for taste, impartiality, judgment, and courtesy, rather than to trust the picture to the keeping or care of the Royal Commissioners. It was an immense success. The subject, *Bringing Home the May*, from quaint old Spenser—

> "When all is cladde
> With pleasaunce; the ground with grasse, the woods
> With greene leaves, the bushes with blooming buds,
> The younge folke, now flocken in every where,
> To gather May-bushets and smelling brere;
> And home they hasten, the pastes to dight,
> And all the kirk-pillowes care daylight
> With hawthorne buds."

It is taken on six different negatives: the printing is accomplished without "let or hindrance," and with all that care and completeness for which this artist's productions are celebrated. It is some three feet in length, by a foot deep, and partakes largely of those essential qualities—light, air, and space. This exquisite example of photographic art, with its telling background of rustic scenery and beautiful group of gatherers of the hawthorn bloom, is a triumph alike for the art and the gifted artist who has produced it.

In addition to this picture there was a very interesting series of original photographs, taken in Australia, illustrating the habits and manners of both colonists and Aborigines—views of Victoria and many of the most prominent buildings in and around Melbourne. A folio of Indian views, photographed during a residence at Cawnpore, were contributed by the gentleman who produced them. They were of great interest, and most admirably illustrate the land of palaces and plunder, rapine and rupees.

The Ordinance Survey Department, under the direction of Colonel Sir H. James, was well represented in photozincographic reproductions of ancient documents, &c., &c.

In the Mechanical Department there was an article exhibited of some consequence to photographers—Hayes's waterproof glue—an appliance of the utmost utility to all articles affected by wet or damp, in the construction of cameras, putting together wooden trays or the cases of baths, cementing glass dishes, and other purposes in connexion with the mechanism of photography.

A prize has been awarded to Mr. John Bellows, of Gloucester; and the first bronze medal to the Colonel-Superintendent of the Survey Office, Southampton.

The report of the Art Department—drawn up by a well-known local *wag*—after expressing an opinion on the great improvements, both graphic and photographic, since the previous meeting, concluded by expressing admiration of Mr. Williams's *Wigs!*

PHOTOGRAPHIC PRIZES.

THE following photographs were selected as prizes in the Art Union distribution of the above Institution—which took place on the 30th of September—the Rev. W. Rogers in the chair:—

4017.	*Early Spring*	R. Vigurs, Esq., Falmouth.
3014.	*Do.*	Mr. Dunning, Plymouth.
2268.	*Do.*	Mr. R. Henstep, Falmouth.
225.	*Do.*	Miss Sharpe, Falmouth.
3810.	*Do.*	Signor Colonna, Falmouth.
1464.	*Top of the Hill*	Miss Blenkinsop, Penryn.
3592.	*Do.*	Mr. Gregory, Cornwall Railway.
1226.	*Do.*	Mr. Downing, Cardiff.
325.	*Lady of Shalott*	Mr. Braund, Camborne.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

The second meeting of this Association for the session 1862-3 took place at Myddelton Hall, Islington, on Wednesday, the 22nd ult., at eight o'clock,—George Shadbolt, Esq., Vice-President, in the chair.

The meeting was numerously attended, and the large collection of photographs exhibited by the various members contributed greatly towards the interest of the evening.

The following gentlemen were ballotted for and duly elected members of the Society:—Messrs. J. Pargetor, of Dalston; Joseph Gale, of Bermondsey; — Fisk, of Woodbridge; and M. Whiting, of Bermondsey.

The minutes of the last meeting were read and confirmed. Mr. Hill presented four prints to the Society's album.

The Chairman then called on Mr. Dawson to read his paper *On Some of the Causes of Failure in Photographic Printing.* [See page 403.]

At the conclusion of Mr. Dawson's paper,

The Chairman stated that Mr. Simpson had handed to him an announcement to the effect that Mr. Cooper, Jun., had brought a paper on a somewhat kindred subject to that of Mr. Dawson's. He (the Chairman) thought it, however, preferable to proceed with the discussion on the paper which had just been read previous to calling on Mr. Cooper for his communication.

A Member asked what proportion of salt Mr. Dawson would recommend for the solution employed to immerse the prints in after removal from the pressure-frame?

Mr. Dawson thought the proportion by no means important, so a decided excess were used.

The Chairman, in allusion to Mr. Dawson's observation on the phototographs sent to the International Exhibition, and the want of permanency by which they were characterised, thought it somewhat doubtful whether so much care was exercised in their preparation as Mr. Dawson seemed to imagine, since it happened in many cases that intending exhibitors were not aware that space was allotted to them until the last moment, when some prints were hurriedly prepared for the occasion, and if some of these faded it was no more than might have been expected.

Mr. Simpson supported the opinion of the Chairman, and stated that Mr. Wilson, of Aberdeen, had informed him (Mr. Simpson) that the views he had exhibited were prepared under circumstances such as had been described by the Chairman.

Mr. Dawson was of opinion that such a combination of circumstances, however inconvenient at the time, could not be accepted as an explanation of the cause of the photographs in question fading, since twenty-four hours were sufficient to prepare photographic prints of undoubted permanency: the cause must therefore be sought for elsewhere.

Mr. Hill described to the meeting a peculiar brown stain which he had the bad fortune to get on the back of many of his prints, and wished to know if any explanation could be given of the unpleasant phenomenon.

Mr. Hislop had had similar disagreeable experience, and would be equally glad to receive information relative thereto.

Numerous suggestions were offered by various members, but no definite conclusion was arrived at.

Mr. Seeley asked if any fear of fading need be entertained on account of the acid reaction of the acetate of soda if the fixing operation were performed in a decidedly alkaline bath of hyposulphite of soda?

Mr. Dawson—who first misunderstood Mr. Seeley's question—after an explanation from the Chairman, replied that hyposulphite of silver was as readily formed in an alkaline as in a neutral solution. If, however, chloride of sodium were in excess no sulphide of silver would be formed, although the action was the same whether a large or small quantity of chloride of sodium were present. However strong the nitrate of silver solution employed, a hypo. bath containing chloride of sodium would be found to dissolve it all.

Mr. Seeley observed that he had used equal weights of acetate and carbonate of soda for his toning baths, and had obtained yellowness in his skies, very much to his annoyance. He would therefore ask if the use of chloride of sodium in fixing would preclude the necessity for immersing the prints in a solution of that salt before toning?

Mr. Dawson replied in the negative, enlarging on the importance of copious washing with water between each operation, since acetate of soda and nitrate of silver decomposed hyposulphite of soda with equal facility.

The Chairman presumed that, if he understood Mr. Dawson rightly, he wished to convey the fact that in the presence of hyposulphite of soda the usual affinities were upset, and that hyposulphite of silver would be formed in preference to the chloride of that base. He thought it probable that many members were not aware of the fact alluded to by Mr. Dawson in his paper with reference to the combination of albumen and nitrate of silver, which was insensitive to light, or nearly so. It was discovered by Mr. Spiller that hyposulphite of soda is unable to dissolve away the whole of the silver salt in combination with albumen, and an account of his experiments appeared in a late number of the *Photographic News*, to which Mr. Dawson's paper made allusion. He, however, could corroborate the statement most fully from his own experience, so far as having always found that hydrosulphate of ammonia produced a stain upon the whites of proofs on albumenised paper, but he had attributed this to imperfect manipulation.

Mr. Simpson thought Mr. Dawson in error in supposing that this compound of albumen and silver was utterly insensitive to light. He would admit that it was very insensitive, but not entirely so. He had some specimens of prints which had acquired a decided yellow colour in the whites from exposure to light; while others, prepared under similar circumstances and with equal care, had preserved the purity of their whites when protected from the action of the light. He thought the change in the former case fairly attributable to the action of light on the residual albuminate of silver.

Mr. Dawson was disposed to concede that the peculiar compound in question might be slightly sensitive to light, but would submit the question whether or not the effect described by Mr. Simpson was not attributable to the action of the atmosphere on that portion of the photograph not in immediate contact with the passe-partout?

Mr. Hill thought some elucidation of the question might arise by ascertaining the action of air and light on plain paper.

Mr. Simpson observed that photographs on plain, *i.e.* non-albumenised, paper did not acquire the yellow tinge.

Mr. Hislop reminded the members that plain paper *engravings* often acquired the yellow colour in the entire absence of both nitrate of silver and albumen.

The Chairman thought the change referred to by Mr. Dawson, with reference to some samples of foreign paper, as taking place in photographs might, perhaps, arise from the employment of some sizing material other than starch—such, for instance, as gelatine or other animal size.

In the absence of any further remarks on Mr. Dawson's paper, the Chairman called on Mr. Cooper, Jun., to read his short paper *On a New Method of Printing.* [See page 435.]

Before reading his paper Mr. Cooper passed round for examination by the members a very extensive and superior collection of prints by his process. It was observed that Mr. Cooper had adopted the style of printing by masks, producing shaded backgrounds, first introduced by Mr. Harmer, and exhibited by that gentleman in the Photographic Department of the International Exhibition. This style of printing greatly enhanced the beauty of Mr. Cooper's prints, which were very generally admired, and otherwise regarded as apt illustrations of the peculiar results obtainable on the resinised paper. One large twelve-by-ten-inch landscape, from a waxed-paper negative, exhibited at the close of the meeting, was deemed especially adapted to this method of printing. Two specimens of simply resinised paper were also shown by Mr. Cooper:—one prepared with benzoin, and kept a month, had turned yellow, while the other, prepared with frankincense, mastic, and Chio turpentine, and kept three weeks, had remained perfectly white. Mr. Cooper also explained to the meeting his method of using Mr. Harmer's masks.

At the conclusion of the paper,

Mr. Dawson opened the discussion by asking if resinised paper gave better tones than that prepared with Iceland or Irish moss?

Mr. Cooper had used Iceland moss and found that he obtained a redness of image and decided slowness in toning.

Mr. Dawson said his experience did not coincide with that of Mr. Cooper. In using Canson's paper—which, by the way, he believed was now out of the market—he had obtained good black tones,—the paper having been coated with Irish moss, a certain proportion of salt, and sensitised on an acid bath.

Mr. Simpson was of opinion that more force and vigour was obtainable with prints on resinised paper than on that prepared with Iceland moss.

The Chairman observed that the one point in which prints on resinised paper were especially deficient was transparency in the shadow. Whether any compensation for that defect could be found in the use of other kinds of paper remained to be proved: at any rate the question at present seemed rather to be between plain and resinised paper, as it seemed by no means probable that the latter would supersede albumenised paper. He believed it possessed one great manipulative advantage, in the absence of that liability to curl in drying which characterised other papers.

Mr. Cooper explained that Papier Rive had a slight tendency to curl in drying, which was readily overcome by gently breathing on it. In expressing an opinion on the merits of his own paper at variance with that of the Chairman, he was aware that he might be regarded as not altogether unbiassed in his views: he would say, however, that while admitting the doubt raised in reference to his paper superseding albumen for *small* prints, he could not but think—and an examination of the large print would support his opinion—that resinised paper was better adapted for large views than albumenised paper.

The Chairman said he was loath to look at the defects of a process rather than its merits, still it must be admitted that the process then under consideration was open to a further objection, arising from the common tendency of all resins to turn yellow.

Mr. Cooper had used frankincense five years old, and this had only turned slightly yellow in the mass on the outside.

Mr. Martin suggested that an accurate opinion could hardly be arrived at by comparing the change undergone by resin in the mass and that which took place when the same resin was diffused in a thin film over a large surface of organic matter in the form of paper, and thus ex-

posed to the full oxidising influence of the atmosphere. He (Mr. Martin) believed he was stating the matter correctly when he said that resins generally, even in their hardest condition, contained a portion of volatile oil which had an affinity for oxygen, and that the change of colour was due to the oxidation of this volatile portion of the resin.

Mr. Dawson asked, if that were correct, how it was that the Canada balsam used for uniting lenses sometimes turned yellow?

Mr. Hislop also had observed Canada balsam in microscopic slides turn yellow.

The Chairman, in reference to Mr. Dawson's remark, ventured to doubt if it were correct; but Mr. Ross, who was present, could perhaps give some definite information on the point.

Mr. Ross, in reply, stated that he observed the phenomenon alluded to by Mr. Dawson, but could not say certainly whether the effect was attributable to the action of air or light. It was the custom in his factory, when the Canada balsam in bulk became coloured, to place it in the sunlight, which had the effect of bleaching.

Mr. Simpson had observed that the varnish on maps and globes sometimes turned yellow and sometimes not.

Mr. Martin thought that the somewhat conflicting opinions which had been expressed on the point tended rather to support the explanation he had offered of the cause of the colouration of resinised paper. A contrary view of the subject had certainly not been established: he submitted, therefore, that his original statement still held good.

At the conclusion of the discussion, Mr. Seeley exhibited some very excellent six-by-five prints from tannin negatives; Mr. Shave, some stereographs of Devonshire scenery, and Mr. Fenn some seven-and-a-quarter-by-four-and-a-half prints by the wet-collodion process. These were much admired. Mr. Simpson also exhibited a specimen of photo-zincographic reproduction, by Col. Sir Henry James's process.

The next meeting of the Society is to take place on the 19th of November, when Mr. Hislop is to read *Some Additional Notes on Simple Washed Collodion.*

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

The first meeting of this energetic Society for the session 1862-3 took place on the 8th ult. M. Gabriel, President of the Society, occupied the chair.

The President opened the meeting by expressing the satisfaction he felt at seeing the labours of the Society resume their habitual course. The Photographic Society of Marseilles, by its zeal, its activity, and its initiative undertakings, had already acquired a place in the foremost rank of those Societies devoted to the art of Niepce and Daguerre. These first successes promised much for the future of the Society. It would always afford him much pleasure to assist at each proof of fresh progress. He would always be happy to march at the head of a Society animated by the spirit which characterised that over which he had the honour to preside, and which evinced such a laudable emulation in view of the constant success of their enterprises.

M. Leon Vidal desired first to thank the President for the kind terms in which he had spoken of the Society. He felt that he was only giving expression to the sentiments of the members generally when he tendered their deep gratitude for the constant zeal with which he (the President) had presided at their numerous meetings. He continued in the following words:—

The year which draws to a close, gentlemen, has been for us a year of creation. We have had everything to do; we have attempted many things; and, thanks to your intelligence, success has crowned our efforts.

The Photographic Society of Marseilles has proved that it knew how to rise to the height of the mission it had imposed upon itself. It has never held back its influence in any circumstances in which it was likely to prove useful.

I will not now speak to you of the numerous difficulties we shall have to overcome. We fight together. I do not consider it necessary to remind you of the various flattering testimonies which have appeared to recompense your activity: you know them. The past, in one word, was ours, and it is gone: it is, therefore, with the future we have more immediately to do.

Although so much has already been done, how much still remains to be done! Our art is hardly out of its cradle: it has all its career to accomplish—a career which will undoubtedly prove fruitful in marvellous discoveries, and in results and applications of increasing utility.

I do not doubt but that you will share in this progress of the future. Everything encourages me to hope that this will be the case:—your aptitude, your initiative force, as well as the fortunate material conditions of the Society,—your numerous means of action and powerful aid in the propagation of our art.

These means of action you will find in the institution of the "Art Association," the installation of which progresses rapidly. This new and great institution will very soon inaugurate its place of meeting: you know the part therein assigned to photography. You will find there not only an exclusive centre, where you may meet on days other than those on which meetings take place, and where you may consult the various publications, but there will also be a permanent exhibition of the products of our art, and a laboratory conveniently furnished for all the applications of heliography. In these rooms for meeting practical courses of study may be organised under our direction.

These, my dear colleagues, are the conditions of success, which I am convinced cannot fail to impart to our proceedings a new impulse.

We have already—more than a year since—reviewed in three lines the chief points of interest in the progress of our art. The direction indicated was as follows:—

Dry Collodion, rapid and instantaneous.
Enlargement, as perfect as possible.
Positive Image, by a permanent process.

In these three lines is included all the future of photography; and I would urge upon my colleagues that, while they receive with gratitude every effort put forth to favour the progress of photography, they should receive with especial favour all the labours directed towards the realisation of the three improvements I have indicated. Hitherto great progress has been made in these directions; and you know that the efforts of our *savans* are incessantly directed towards accomplishing still greater things.

Before the Society resumes its usual proceedings, allow me in your name to renew our invitation to the sympathy of the photographic world. The numerous communications which have been sent to us up to this time are a manifest proof of the confidence which is inspired by our zeal and our impartiality. The good traditions of our Society will, I am free to affirm, not be altered; and it will be our honour to have contributed to the progress of an art we love, and which holds a distinguished place in the rank of useful inventions.

The above address was very cordially received.

The Secretary then proposed an alteration in the rule referring to the election of the Committee, from which it resulted that all the members were eligible for re-election. Two members desiring to retire, MM. C. Tissot and E. Loire were elected to fill their places.

The Secretary reported the receipt of letters from the following gentlemen:—M. van Monckhoven, referring to a new method of preparing iodide of cadmium; M. Marion, accompanied by a piece of his collodionised paper and a bottle of the collodion; M. Ed. Potonie, Director of the International Photographic Exchange, presenting to the Society some very excellent German photographs by Messrs. Gustave Schauer, of Berlin, and Jos. Albert, of Munich, after the cartoons of Kaulbach, making part of the Shakspeare Album. M. Potonie, in another letter, directed the attention of the Society to the Permanent Exhibition of Photographs which he had organised in Paris. Copies of the rules were distributed among the members. A communication had also been received from M. De Courcival, officer in the 3rd French Chasseurs, presenting to the Society some interesting African photographs.

The thanks of the Society were accorded to each and all of these gentlemen for their gifts and letters.

The President, in requesting M. Hudelot to present his report on the contents of the various publications, availed himself of that opportunity of putting amateurs on their guard against assertions which were frequently published without the slightest verification, and had much pleasure in informing them that for the future a Committee of Verification would be organised to ascertain whether these hastily-published statements were worthy of credit.

M. Meynier introduced a new developer, consisting of a double salt of iron and ammonia, which he said possessed the combined advantages of iron and pyrogallic developers. Three gentlemen were appointed to experiment on this point.

M. Tissot exhibited an instantaneous shutter, which differed essentially from most of those hitherto introduced, inasmuch as it opened from the centre towards the circumference. The shutter was attentively examined by the members present, and the inventor was warmly congratulated.

M. Leon Vidal exhibited a new form of actinometer, by means of which the time of exposure would be correctly indicated for varying degrees of intensity in the light. The instrument is not yet completely finished, but will be shortly submitted to a Committee for trial. M. Vidal exhibited also a cardboard box for holding ten sensitised plates.

The President thanked these gentlemen for their communications.

M. Hudelot, Secretary of the Committee appointed to examine the auto-polygraph of M. Leon Vidal, read the report thereon. After a somewhat lengthy description, the report concluded as follows:—

The auto-polygraph is a real photographic conquest:—a dark chamber of the smallest possible dimensions, a box for containing the plates necessary for a day's work, a case filled with sensitised plates, including all the baggage necessary for a photographic tour.

With this apparatus it is possible to work in the open air without any tent or double-back. The manipulations are simple and easy. A graduated scale attached to the camera, and furnished with a suitable index, shows how many plates have been exposed, which plate is next to be dropped into the camera, and the exact position of the plate-box, so that a mistake is almost impossible.

When instantaneous dry collodion shall have been discovered, this new apparatus will be doubtless employed to the exclusion of those now in use.

The stereoscopic apparatus has received special attention at the hands of the Committee.

We append an abstract of M. Vidal's description of

The Auto-Polygraph.

This title is chosen to indicate a photographic camera by means of which a great number of consecutive views may be taken automatically.

By means of a grooved plate-box placed on the top of the camera, the apparatus admits of the carriage of a great number of sensitised glasses, and of their being submitted directly to the action of light by a simple movement of grooves and springs. The plate intended for exposure falls from the box into the groove destined to receive it, and it is only necessary to reverse the apparatus in order that the plate shall return to its original position, so that the entire operation of exposure may be effected with no more trouble than the mere touching of certain springs and grooves, and the inversion of the whole apparatus. This arrangement is applicable to all sizes of glasses, and to binocular as well as simple cameras.

A light tripod-stand, of bamboo or other suitable material, supports the auto-polygraphic camera. The apparatus is specially adapted for the dry

collodion process, but it may be readily modified to suit wet collodion by the addition of another focussing-glass and a camera-back for wet plates. The whole apparatus is very light and portable, occupying a very small space, and may be easily carried in an oil skin or leather case; and the camera-stand being doubled up and wrapped in a similar manner, no amateur or artist would object to increase his baggage to so small an extent as is involved in the carriage of this *vade mecum* of photography.

Dry plates having now became a regular article of commerce, the employment of the auto-polygraph will become very easy. The manipulations connected therewith being once mastered, the only remaining difficulty will be the time of exposure—a point soon overcome by a little practice. Amateurs thus relieved from the annoyance of long, delicate, and troublesome preparations, will be able to devote their undivided attention to the artistic portion of their work.

M. Hudelot: M. Vidal has given to photography a useful and charming apparatus, and I am glad on this occasion to be the chosen organ of your Committee which proposes to offer to our devoted Secretary its warmest congratulations on his beautiful invention.

The President thanked the reporter, and ordered the registration of the report.

The Secretary, in the name of the Committee, directed attention to the Rules of the Second Exhibition of the Photographic Society of Marseilles, and also to a proposition relative to the establishment of a practical course of photography in the first month of 1863, in connexion with and to take place in the great hall of the *Art Association*.

This motion was cordially received It was unanimously agreed that the programme of this course should be speedily drawn up, and that M. Leon Vidal be invited to undertake this task in the name of the Photographic Society of Marseilles.

The meeting was then adjourned.

Regulations of the Second Exhibition of the Photographic Society of Marseilles.

In organising a public Exhibition of Photographic Pictures and Apparatus the Photographic Society of Marseilles invites all French and foreign photographers to take part therein.

All manufacturers of photographic apparatus are also invited to this Exhibition, to which they can send all their special instruments, such as lenses, cameras, camera-backs, camera-stands, baths, &c.; in one word, all apparatus, or parts of apparatus, employed in photographic manipulations. The same appeal is addressed to all manufacturers of photographic chemicals, authors, editors, &c., for specimens of chemicals, or works of theory or practice interesting to photographers.

The Society considers it proper to recommend the exhibition only of *new* proofs—that is to say, of those which have not appeared in public before. Special attention also will be directed to obtaining pictures illustrative of new processes, or which tend to new discoveries, enlargements, carbon prints, ink prints, photolithographs, photoglyphographs, impressions on silk, &c., and other materials.

1. The opening of this Exhibition will take place in the course of January, 1863, and will be held in a room constructed with especial reference to its being used for this purpose, dependent on the *locale* of the Art Association. It will last one month or more.

2. All packages should be addressed, *carriage paid*, to the Secretary of the Art Association, before the 15th December, 1862, at the latest. This date must be strictly observed.

3. Each package should be accompanied by a detailed statement of the number of articles sent and signed by the exhibitor. Manufacturers of apparatus are requested to attach to what they send, independent of their catalogue and prospectuses, full instructions and descriptions necessary to the demonstration of their instruments, which will be made at public meetings organised by the Society.

4. Except in special cases, in which it will be necessary to communicate before hand with the Committee of Management of the Society, there will not be accorded to each exhibitor a space of more than from six to nine feet square.

5. To avoid expense and difficulty of transit, those exhibitors who have not a correspondent in Marseilles, may send their proofs, unmounted, to *M. Le Secretaire de la Societe de l'Union des Arts à Marseilles*, who will take care that those proofs which are to be placed under glass shall be so treated as carefully and economically as possible. In this case the packages should reach him by the 10th of December, at the latest.

7. All negatives on glass or paper, proofs on metallic plates, on stone, or on wood, which exhibitors may desire to send with their positive proofs, will also be received and deposited in suitable places in the Exhibition, with all the necessary precautions. The same remarks apply to negatives which may be sent with the apparatus by the aid of which they have been taken.

8. Exhibitors should write their names and addresses upon each proof, or on the frames containing a number of proofs; but they are desired, under pain of non-admission, not to attach any inscription the form or wording of which would seem to possess the character of an advertisement.

9. It is absolutely necessary that each proof should be named, and a summary statement of the negative process employed, such as wet or dry collodion, albumen, waxed-paper or not, attached thereto. The Committee will also be happy to receive any further instructions on the method of procedure in taking the picture.

10. The selling price may not be indicated either on the proofs or frames or apparatus.

11. The Committee of Management propose to purchase a certain number of proofs intended to be drawn for by lottery at the close of the Exhibition. Those exhibitors who are desirous of disposing of their proofs are requested to state the price at which they wish them to be sold to the Secretary, who will furnish the information to the Committee of Management and to the public. The same suggestion is offered to the exhibitors of photographic apparatus.

12. Nothing sent for exhibition can be withdrawn before the close of the Exhibition.

13. The Photographic Society of Marseilles will receive with gratitude and place in their portfolio all proofs interesting in point of art or process which any photographer may desire to offer for that purpose. The proofs sent for exhibition will be examined previously by a Jury of Admission, named from among the active members of the Society.

14. All objects exhibited must be withdrawn, or will be returned, at the expense of the exhibitors, within fifteen days of the closing of the Exhibition.

15. Although the Photographic Society has not decreed the offering of any prize or medal, it considers that it should nevertheless bring to the notice of exhibitors the fact that the Society of the *Art Association* reserves to itself the right to recompense those objects exhibited in its rooms which it shall consider worthy of special distinction.

The proofs, apparatus, &c., which shall have figured at the Photographic Exhibition will be admitted to compete for this advantage.

All letters and communications should be addressed to the Secretary of the Photographic Society, *a l'Union des Arts*, Marseilles.

"Our Satellite: a Selenography According to the Present State of the Science."—We have to notice the first part of this new and important scientific work, containing matter descriptive of the topography of the moon, illustrated with photographs of spots and regions taken at different periods and under varying circumstances of illumination, and with photographic maps in outline, traced with parallels of latitude and longitude. A photograph of *Tycho* is included, which shows the surrounding country, also large photographs of separate parts, and various stereographs.

Novel Use of Photography.—Speaking of the International Exhibition, a writer in *Chambers's Journal* says:—"Among the least dreadful things in it [the anatomical department] are the artificial limbs and eyes, which beckon and stare at the astonished spectators from all sides. There are depôts of these eyes, it seems, all over the world, the colours in the collection being adapted for persons inhabiting northern climes, as well as for natives of a tropical region. A one-eyed emigrant might therefore start from Europe—let us say—with a black eye, and change it for a more convenient tint upon the various stations upon his route. Those who wish to procure an artificial eye by correspondence, need but to state the colour, and send a photograph of the patient's full face; he will then receive what he requires in the course of post, with natural and expressive movements. It seems to us, however, that the character and position of the portrait should be also stated; for conceive a staid divine embarrassed with a too-expressive eye which winked (however naturally, and the more naturally so much the worse) at the ladies of his congregation."

Up Among the Photographs.—The writer above quoted also describes his visit to the British Photographic Department, which, says he, "contains the best specimens of photography, and is one of the finest treats in the Exhibition. The stairs that lead to it are steep, and drew forth a passionate expression of opinion from one lady in my hearing, who carried a good-sized infant—that 'there ought to be a place to leave the babies in, the same as the umbrellas!' But when they are once surmounted we are repaid for our labours. * * * A collection of admirable photographs presents us to all the finest scenes of this beautiful land, and reminds many of happy summer days spent among the scenes themselves. These landscapes, transported bodily by the magic of art, and brought into the din and steam of town, are indeed things to be thankful for. They touch the sacred fountain of tears as potently and far more universally than any poem. They even console, so long as he looks at them, the gazer, 'in city pent,' for his enforced absence from those breezy fields, those foaming brooks, those woods in which light and shade never cease their glorious struggle. Above all, there are some photographs from the sea-side which only require the sea air and the briny fragrance to make the illusion complete. As we stand in the hot room, amid the roar of the streets, with our eyes in the stereoscope, we feel indeed as if we were far away from any such place. We are on the wet and pebbly beach that shimmers in the sun, while the retreating foam-topped wave yonder is gathering strength once more to regain its territory. The far-spreading ocean lies before us speckled with sails and seagulls, as is the sky with clouds. Or we stand upon the moonlit shore when all is calm and still, and the almost waveless sea laps on the crag. In the International Exhibition there is much to thank Art for, which God has permitted to do such great things for man; but we thank her for nothing more gratefully than for this wonderful process by which she has actually brought home to us Nature herself."

Foreign Correspondence.

Paris, October 27th, 1862.

I AM sure the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY will not think it strange that your French correspondent should defend the right of one of his fellow-countrymen in a question of priority. In THE BRITISH JOURNAL OF PHOTOGRAPHY of the 15th of October, I read a letter taken from *The Times*, in which Col. Sir H. James complains of an assertion in the report of the proceedings of the British Association tending to prove that the process of Mr. Osborne (of Melbourne) was "the first in which the photographic image on stone was produced by means of transfer." Colonel James states that his process was published in 1859, and Mr. Osborne's in 1860. It is to be regretted that Colonel James did not also state that the method on which his own and all the others are based—namely M. Poitevin's—dates from 1854. M. Poitevin is certainly very unfortunate. While two English inventors are disputing for priority in a discovery which he had made known five years before them, a leading German newspaper—the *National Zeitung*—pompously announces that a Prussian officer, M. Bourchhart, has just invented photolithography! What will Colonel James and Mr. Osborne say?

I think that a certain number of persons who have not visited the London Exhibition, or who, having visited it, have been unable to examine the heliochromic pictures of M. Nièpce, have mistaken the nature of those specimens. They seem to confound them with the coloured engravings on stone and marble, or with the attempt at colouration with salts of iron, by the same gentleman. The images in question are really pictures reproducing the natural colours; that is to say, M. Nièpce reproduced coloured drawings upon the silver plate by contact, and in such a manner that in his copies the yellow came yellow, the blue came blue, &c. But there were also, in cases—which on account of the instability of the image were doubtless shown only to jurymen—reproductions obtained in the camera of a doll dressed out in lively colours. Here also each hue was rendered in its true character. M. Nièpce has just shown me a series of similar images which he has executed within the last few weeks, and which are still more striking than those submitted to the jury. The colours are livelier, and the fixation, which formerly existed but for a few hours, still exists after four days' exposure to a strong diffused light. Evidently there is progress.

M. Charles Nègre has been exciting my admiration by some new heliographic engravings representing fragments of architecture from the Cathedral of Chartres. They are of unusual size and splendid execution. M. Nègre assures me that they are entirely untouched; and I must say that, notwithstanding a close scrutiny, I have been unable to detect any. The modelling is extremely soft; the lights are bold; the darker shades very vigorous, but without blotchiness; and the lighter ones are rendered with delicacy. The whole has a very striking appearance of relief.

As is well known, M. Nègre makes use of a reversed negative instead of employing a positive as M. Nièpce does. Under the influence of the solvent, the portions of the varnish which correspond to the lights disappear, and, the gilding being applied, the gold adheres to the luminous parts. As the varnish is permeable, and becomes disintegrated in proportion to the intensity of the light, the gold penetrates even into certain portions of the deep shades, and thus the modelling and the gradation of tints are obtained. It is thus, at any rate, that M. Nièpce explains the excellence of his process and of the results obtained by it.

With regard to heliographic engraving, I must say that our artists appear to be giving more attention than ever to this application of photography, the importance of which would be so considerable if it could be rendered as practical as the usual processes.

I have already mentioned the idea that M. de la Blanchère has had of offering to the public card-portraits engraved by M. Nièpce's processes, but, unfortunately, much assisted by the pencil. Another portraitist, M. Cremière, who has won some reputation by his remarkable and interesting collection, has just increased his establishment by adding to it a department for heliographic engravings, which he has placed under the direction of Madame Riffaut, the widow of the first artist who practised Nièpce's process with success. Several plates have already been executed very happily, and amongst them the portrait of Auber, our celebrated composer. This engraving is certainly touched in some parts, but so cleverly that photographic truthfulness is in nowise impaired. The portraits of several of our illustrious soldiers have, I am told, been presented to the Emperor within the last few days. As the usual sized portraits of this kind do not exceed in price the generality of good pictures (being sold at one hundred francs the plate) they may possibly find favour with the public. It is, however, especially for albums and publications that M. Cremière's undertaking is calculated to be useful.

A new developer for collodion pictures was presented to the Photographic Society of Marseilles at its last meeting: it is a double salt of iron and ammonia.

The meetings of the French Society of Photography were to be resumed on the 18th of October, but have again been postponed.

ERNEST LACAN.

Philadelphia, October 8th, 1862.

THE majority of American operators make use of iodide of ammonium as the principal sensitiser, taking for the bromide any of the other metals their experience suggests as the best. The iodide of ammonium used to be made quite white; and, assuming this as a proof of its purity, the white article was the most sought after. But some photographers seemed to prefer the yellow variety, and, without knowing any reason for their choice other than experience, would prefer those samples which were decidedly yellow. In the course of time it became a standing rule to select the very darkest yellow, such having been found to produce the best negatives. This very dark iodide of ammonium is now regularly offered for sale, labelled "*Ammonium Iodide for Negatives;*" and all who use it concur in the assertion that, from the large amount of free iodide in it, it is the best—that collodion sensitised with it is sooner ready for use. It would be a matter of interest also to determine what bromide is most generally used. There seems to be a great difference of opinion on this subject; but, from noting the experience of those who have communicated their formulæ to me, I think the bromide of cadmium has just now the preference. A photographer writing from the west says he has been obliged to discontinue the use of bromide of magnesium, as it neutralised his bath too rapidly. The sample he had been using perhaps partook too much of the alkalinity of its base.

I mentioned in my last letter that the majority of the pictures made for the soldiers in camp, or as they pass through any town, are ambrotypes. This is because their movements are too uncertain to allow for the delay of paper pictures; besides, many of them have a liking for the fancy cases in which their portraits are enclosed—and, in addition to all this, they are *so cheap*.

A gentleman just returned from Europe says there is the greatest difference imaginable between the general management of photographic galleries here and abroad. In America everything is done in a hurry. The people are, as a mass, impatient and restless—they are always in a hurry; and it is no unusual thing to see a man rushing into a photographic establishment, exclaiming as he enters—"Here! I've just ten minutes to spare, and want you to make my picture!" The accommodating operator puts him through in a short time, and it is no wonder the portrait shows a face of rather a care-worn aspect. In Europe, on the contrary, my informant says people seem to have more time, and would object to being "taken" so very rapidly. By-the-bye, *The Times*' criticism of the card-pictures of American notabilities, furnished by Messrs. Brady and Co., of New York, has afforded a good deal of amusement on this side of the water. People laugh at the "Thunderer's" "secesh proclivities" influencing its opinion of pictures. Much credit is due to Messrs. Brady and Co. for their untiring search after reliable portraits of our great men, and they publish no pictures that they cannot with credit attach their name to. No doubt great tact and address is required to secure sittings from those men who are now so engrossed with official cares, some of whom call this picture-taking a bore, and escape from it when they can

A subscriber to THE BRITISH JOURNAL OF PHOTOGRAPHY writes from New York, inquiring whether the eighteen-inches condensing lenses, spoken of in former letters in connexion with solar cameras, are the diameter or the focal length. In all cases I alluded to the diameter of the lenses, their focal length differing in different instruments. It is, however, claimed that those of the shortest focus are the quickest workers. It is probable, from what I hear, that it would be advantageous to vary the focal length of the condenser with variation of work—as, for instance, to throw up a given-sized picture from a whole-size negative. The distance of the negative from the copying-tube and the distance of the printing-board from the tube are fixed and unchangeable; while, to work the quickest, the focus of the condensing lens should be such as to cause a condensed circle of light to just cover the part of the negative to be copied, and to come to a focus at or near the front lens of the copying-tube. This is theoretically what seems to be required; but much latitude is assumed in practice. Still, the best

printers with the solar camera say that they prefer to carry out this theoretical requirement by varying the size of the negative, and to intensify also in proportion to the size to which it is to be enlarged, thus using a small negative—say half-size for full-size prints and a ¼ negative for cabinet size, the latter being made more intense than the former. The writer above alluded to goes on to say:—"Many years ago—in 1851 or 1852—I used Ross's megascopic camera, which is precisely the same as the solar camera, except that he had discarded the reflector, using a ground-glass instead. His condenser was two plano-convex lenses, beautifully *chromatic*, with a combined focus of 14 inches, and their diameter was about 8 inches. It was originally intended to copy 2½ by 2 inches Daguerreotypes to full-size plates, 8½ by 6½ inches, and was contrived in 1843, or thereabouts, before there was a whole-size plate instrument in New York. It was presented to the clear sky, using a single lens to make the image and an elevating table to get the focus and to hold the plate while being impressed. I still think this was the best arrangement, as it certainly was the earliest. He claimed no invention about it, for he showed any one its principle in Smith's *Optics*, and in a French work by Biot." I give his letter almost entire, as it may be of interest to those studying the history of photography. The expression, "he had discarded the reflector," probably was not intended to convey the idea that he had used a reflector and then discontinued the use of it, as it is generally conceded that Woodward was the first to use a reflector.

Various contrivances have been offered for cutting out photographs, one of the simplest being a punch with a sharp cutting edge, similar to what is used for cutting gun-wads, the tool being made, of course, of the required shape of the print. The most serious difficulty in the use of such an instrument lies in the selection of the substance of the block to do the cutting on. The end grain of some kind of wood serves well for the purpose; but it soon gets rough and uneven. A new substance has just been introduced for this purpose, which seems to be just the thing. Strips of raw hide about two inches wide and twelve inches long are clamped together by bolts passing through them, thus forming a hard slab twelve inches square and two inches thick of hide standing on its edge. The surface is planed down smooth, and will bear an incredible amount of cutting on with the punch before needing re-dressing. This article is now being extensively used in several establishments in this country where paper is to be cut into shapes by chisel-shaped cutting edges. The tanner's old maxim of "there's nothing like leather" must be changed for "there's nothing like raw hide." Should any photographers find the journals of their polishing rollers inclined to cut from the pressure on them and from the neglect of oiling, let them put a piece of raw hide between the journal and the bearing and they will have no more trouble. This article, from its great toughness and durability, has always held an important place in the arts and manufactures—as, for instance, being used for small cog wheels in some class of silk-weaving machinery, as well as being made to act as the elastic and yet nondestructible cushion to save the ends of wooden piles from being crushed by the oft-repeated blows of the pile-driver.

Not many hundred miles away there is being built, by Uncle Sam, a very nice building, intended for a front office, and the contractor who is erecting its marble front was some days ago presented by a photographer with a print from a negative he had made of it, and which was of interest as showing the progress of the work. "What!" exclaimed the contractor—"did you get all the men to remain still while you were taking this?" "Oh no!" was the reply, "I watched my opportunity, and the picture was taken without their knowing anything about it!" "Well, my dear sir, I thank you for the picture, and also for the information too. There's that foreman of mine, who was to have kept his eye on the men the whole time the front was being built up, idling his time away, and paying no attention to his work! I'll see him about that!" This is a true story, for it was told to me by some one who had read it in a newspaper; and newspapers, you know, from *The Times* downwards, never lie.

Of late we have had some dull cloudy weather, and the storm has no doubt been what is usually called the equinoctial. This rainy period past, photographers will look forward to the long clear spell called the Indian summer. Some days, however, of our delightful Indian summer are almost as bad as clouds. There is a kind of yellow haze pervading the atmosphere which shuts out much of the sun's actinic power, even while it is shining very brightly. This reminds me of the remark made a few nights ago by an ardent amateur, when a lady exclaimed to him—"See! what a charming moonlight night! It is almost like day!" "Yes! I see: very pretty, but horridly non-actinic!"

COLEMAN SELLERS.

Notes of the Month.

Autumn's "fading realm" is now presenting that chameleon-like beauty of varying hues which is so charming to those who have "an eye for colour" in a greater degree than for loveliness of form. But the hectic flush of October sunsets, like that on wan Consumption's cheek, is only an indication that the unequal struggle will soon be o'er—

"And the last lingering leaf will flee
To seek its fellows."

As the dreary month of November creeps upon us, the prospect is enlivened by the knowledge that the sessions of the various Photographic Societies, which now open with renewed life and activity, will rouse up photographic discussion, and other interesting matters which remain in abeyance during the busy months of summer; and the anticipation of entertaining or instructive papers to be read opens out a vista which robs the winter of half its tedium.

The great event of the past month in the scientific world has been the meeting of the British Association for the Advancement of Science at Cambridge. The meeting presented its usual characteristics. Valuable papers, and valueless papers, were read; and there was what a writer aptly terms "the full proportion of scientific trifling." Much, certainly, that passes as new or profound with a general mixed auditory invariably excites a smile from those "well up" in that particular section. One of the most amusing pieces of audacity was the cool assumption contained in a paper *On A Rapid Dry Process*, by Thomas Sutton, B.A., a recognition of the means of producing a quick-acting film (bromo-iodised collodion) having been literally forced upon its author by the undoubted successful experience of others. Photography took high rank at the meeting—not so much by right of the "papers" connected with the art, as by the way in which its useful application permeated everything.

A considerable amount of nonsense has lately been published about the supposed great facilities opened up for the perpetration of forgery in connexion with the Bank of England notes by means of some of the photolithographic processes. Some years ago the authorities of the Bank of England incurred considerable trouble and some expense in order to ascertain how far photography, in any of its numerous phases, could be misapplied to the purpose of producing counterfeits of their notes, but the results were such as entirely to dispel any apprehensions upon the point; and though some imagine because photography has made rapid progress in every branch, and especially in the practice of photozincography, that therefore the apprehended danger has again arisen. Their fears are entirely unfounded; and the Bank authorities simply laugh at such fears, because there is a stumbling-block in the very principle involved which it is not advisable to point out here.

Amongst the new books of the coming season, Messrs. Chapman and Hall announce *Italian Sculptures of the Middle Ages, and Period of the Revival of Art* by J. C. Robinson: the photographic illustrations by C. Thurston Thompson.—Messsrs. Bentley announce a work under the curious title of *On the Mountains; or, Welsh Experiences of Adam Black and Jonas White, Esquires, Moralists, Photographers, Fishermen, and Botanists*, by the Rev. George Trugnell.

Mr. Durham's great work, *Memorial of the Great Exhibition of* 1851, is now nearly completed. It is said that this will be one of those few public statues of which we shall be, not ashamed, but proud.

The statistics of the Photographic Department at the South Kensington Museum, for the year 1861, show that 8,814 photographs were issued, and the amount received £715 14s. Of this sum, £111 17s. 7d. were paid to the Trustees of the British Museum, on account of positives sold, and as royalty on negatives.

It is worthy of remark—even at this late stage—that *The Times* and the *Art-Journal*, in two recent articles, strongly condemn the course pursued by the Executive of the International Exhibition towards photography. Such an expression of opinion *coming from without* is peculiarly valuable, as endorsing the opinions of those who naturally have a personal feeling in the matter.

Simultaneously with the publication of these pages, the Great Exhibition of 1862 will be closed to the general public—though accessible for other purposes for a fortnight longer—and its glories and successes, its blunders and failures, become things of the past. To the officials, at least, it will be a welcome release from a distracting conflict of sounds—from Kirkman's grand piano, from Foster's grander organ, and from some one else's still grander orchestrion, all *agoing* together—from singing automatons, toy-drummers, and piping bullfinches, machinery in motion, viands in consumption, scented fountains, and garlic-odoured foreigners, red-tape, and official routine generally.

S. T.

Scraps and Fragments.

International Gatherings of Industry and Art.—A grand Palais de l'Industrie, which is to be permanent, is announced to be opened near Paris early in 1863, at Ateuil; and an Universal Exhibition is also announced as being about to be put in progress at Madrid.

Wood Engravings Superseded.—Among the literary rumours of the month is one which says that a new illustrated paper, to be issued semi-weekly, will shortly be announced in which photographs are to take the place of the usual woodcuts. We are not sanguine of its success, having some little knowledge of the difficulties involved in such an undertaking.

The Japanese Ambassadors and their suite, having made a short stay at Verviers on their return from St. Petersburg and Berlin, attracted great attention in that "Belgian Leeds." They have become so much accustomed to be gazed at, that they have now begun to enjoy the excitement; and, in order to gratify many of the inquisitive, they even distributed their photographic *cartes de visite* to the numbers who flocked to see them there on their arrival and departure.—*Letter from Brussels.*

Hint for the Glass Room.—As it is frequently desirable to render the glass of the operating room semi-opaque, we quote the following recipe:—"Make a hot saturated solution of Epsom salts, or, still better, of sal ammoniac. Wet the glass window with this solution, laid on equally with a paint brush. The moisture will almost instantly be evaporated, and the salt be deposited in a very beautiful radiated form. This deposition will admit the light, yet cannot be seen through; and, for rendering windows semi-opaque, is infinitely preferable to paint, paste, or other materials employed for this purpose."

Hints for Professional Photographers. — The *Parthenon* says—"Those of our readers who wish to see a very inexpensive exhibition, and one that will not be visible long, will do well to go to the Hungerford Suspension Bridge and look at the ruins of the Market, now being demolished. Many people travel hundreds of miles and spend much money to look at ruins that are not so picturesque as these." Our London photographers should look to this, and those near the Cheviot Hills should also see to the discoveries just made by the excavations on these hills of some very perfect remains of remotely ancient British stone huts and other interesting relics.

Mr. Palgrave on Photography.—Coming in the wake of our *Artist's Letters to a Young Photographer*, the following from the notorious but, withal, very excellent hand-book to the International Picture Collection, by Mr. Palgrave, may serve as a hint to would-be *artist*-photographers. Speaking of *Brett's* pictures in the International Collection, Mr. Palgrave says of the *Val d' Aosta*, and another painting, "they are the most literally realised pictures in the collection." "I never saw the mirror so held up to nature," writes the possessor of *Aosta*; "*but it is mirror's work, not man's.*" There is not altogether such an absence of human feeling (I do not refer to the figure only) in the wood scene; yet certainly these remarkable pictures are the nearest approach hitherto made to what would be the perfect photograph." Considering that Mr. Palgrave earnestly declaims against the false and conventional, and speaks out boldly in favour of entire and absolute truthfulness in all works of art, it is somewhat surprising that throughout his little book photography is so frequently referred to in a spirit strongly antagonistic to its art-claims. That the reason of this may be found in the class of photographs with which Mr. Palgrave is most familiar is proved by the following, in which he says:—"It is in the quality of *Thought* that what makes art emphatically art, lies. The photograph gives us imitation: nature gives us herself—a beauty which nothing can reproduce; but if it were reproduceable we should still desire something different from either—something which shall repeat reality for us coloured by the soul of another human creature!" Mr. Palgrave has, with all his scorn of the conventional and untrue, fallen into the old, old error of endeavouring to separate the inseparable. The natural glory of a sunset can no more be separated from the human sentiments and feelings with which it is associated than ideas of things can be separated from the things which originate them. If a landscape, chosen for the extraordinary human interest and thought which it awakens, be imitated with strict truthfulness, the interest and thought may be fairly said to exist in the picture, be it painting or photograph; while the painting or photograph which awakens neither interest nor thought in the mind of the spectator is assuredly false to nature and unworthy the name of art.

Caution to Photographers.—We have been often struck with the carelessness of photographers in not guarding against accidents with poisonous chemicals, and give the following as a warning:—"A boy, about two years of age, was taken by a servant into a photographer's shop at Huddersfield, and whilst the girl was sitting for her portrait, the child got hold of an uncorked bottle containing cyanide of potassium, and drank such a quantity that he died two hours afterwards."

Garibaldi's Prison.—Interesting photographs from Spezzia will shortly arrive in England, showing us Varignano in all its aspects. Among the admirers of the great patriot these will doubtless command a ready sale. The Italian correspondent of the *Standard* writes, with reference to certain visitors to Garibaldi:—"Then we have other visitors, of a deeper hue, who, I think, have not been received so warmly as they expected, and who are returning to their houses after a short visit to La Spezzia. They yesterday had completely tired out the general, and he was so exhausted that a very curious photograph, in which I am much interested, was unable to be taken." And further on:—"This Swedish artist is a model to his fellows, and expressed his sympathy in a letter, instead of begging for a 'sitting.' As I write, I cast up my eyes and see two artists, in heavy marching order, sallying forth for the Varignano. They will sketch the exterior of the building, the sentries on duty, the convicts carrying coals. A detachment of light sketchers had, however, preceded these, and a heavy battery of photography has been sent up by sea, so if you do not soon know the scene of Garibaldi's confinement as intimately as your own dining-rooms, there is no use in art, and no circulation in 'illustrated papers.'"

Mr. De la Rue's Photographs of the Moon.—M. Gussew, Director of the Imperial Observatory, at Wilna, has received from Mr. De la Rue copies of his valuable lunar photographs, and tested their truth by the aid of careful microscopic measurement. Selecting a considerable number of well-defined and easily-identified features common to each picture, M. Gussew measured, with apparatus constructed for the express purpose of securing unerring precision, their relative distances from the outer circumference and centres, and tested such micrometrical measurements by mathematical computation, when, after duly correcting for parallax and refraction, as affecting the diameter of the moon and the apparent form of its disc, he concluded that the peculiar deviation from the circular—which the figure of the moon palpably displays in Mr. De la Rue's stereographs—is one which does actually exist in the moon itself. Hence he asserts* that in point of fact a certain extent of the lunar surface, having its axis at five degrees from the earth, as seen from the moon at the epoch of its mean libration, may be regarded as pertaining to a sphere of smaller radius than the moon's mean radius by about eighteen parts in 1000, of which the centre is seventy-three thousandths of such mean radius nearer the earth. This indicating, of course, the convexity of the sphere, goes to prove the total absence of air and water on that side of the moon which is turned towards us, although it does not necessarily infer the existence of the same want on that side which is invisible to us. The oft-mooted question, then, as to how far stereographs of the moon, taken, as was first suggested by Professor Wheatstone, with the same instruments, but at two separate times during the epochs of its extreme eastern and western librations in longitude, are correct has received a very satisfactory answer, which gives fresh value to this singularly interesting application of photography, as well as to the very admirable photographs of Mr. De la Rue.

British Association.—A valued correspondent writes to us as follows:—"The lately-concluded thirty-second meeting of the British Association for the Advancement of Science, at Cambridge, brought us, as usual, some few papers on matters photographic; but, also, as usual, these did not contain much that was either very novel or particularly important to readers of journals specially devoted to our art-science. The papers and specimens introduced at these meetings, however, have no small value, as tending to awaken public interest in the many varied applications of photography, and to impress its value on those most likely to appreciate the same. For instance, M. Claudet's practical illustrations of the working of the solar camera seem likely to have an influence in popularising the newly-introduced life-size photographs. However I scarcely think it will be through the instrumentality of the process of tracing by hand an image thrown by the solar camera on an artist's canvas; but rather by the veritable painting on the photograph, as is now commonly and successfully practised on a smaller scale. I remember the time when photographs on

† *Bulletin de l'Acad. des Sci. de St. Petersburg.*

paper were so hard, harsh, and black as to put very many serious difficulties in the way of an artist-colourist. It was a common practice to transfer them to card by the usual means of a tracing point and transfer-paper, and then paint them. Now, although this process was, in my opinion, at least as certain as that advocated by M. Claudet, it was very speedily abandoned when photographs were so improved as to render such a process unnecessary; and I think similar experience will result from the colouring of solar camera pictures. As to the 'black shadows' urged as disadvantageous to the colouring by M. Claudet, Mr. Wall answers that objection in his little *Manual of Artistic Colouring*, in which that gentleman shows that it was a practice with the most celebrated painters of old and modern times to make out the light and shade of their pictures before painting in pigments, which must have made such preliminary sketches appear very similar indeed to a warm-toned photograph."

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

THE ALLEGED RAPID DRY PROCESS.

To the EDITOR.

SIR,—The process which Mr. Sutton described at the meeting of the British Association is one with which I am quite familiar, as I worked a great deal with it between two and a-half and three years ago. It is, doubtless, a good method for some kinds of subjects; but, as far as I can judge from my own experience, it will scarcely justify Mr. Sutton's sanguine expectations.

A plate prepared with gum-arabic is, no doubt, a trifle more sensitive than if tannin had been used on the same collodion. My principal reasons for preferring tannin for general use were the following:—It was difficult, when gum was used, to prevent the film from loosening. A thin coating of India-rubber did not always produce sufficient adhesion, and a thicker coating was apt to crack when the negative was finished and dried. A substratum of gelatine did not always answer. It was therefore necessary to use collodion in a particular condition, or to have a previous coating of coagulated albumen, which involved great trouble. I found the plates prepared with gum to produce most excellent results with great certainty when the subject included little or no sky, otherwise fogging or reddening all over the upper parts almost always appeared, especially when any objects were near and dark enough to require a rather long exposure. Again: if the gum were not thoroughly washed out, it usually made the developing liquid turbid. I found, by many comparative experiments commenced nearly three years ago, that the use of bromide, in about the same proportion which is now recommended by Mr. Sutton, greatly accelerates dry collodion, and for about two years I have used and recommended it; but I do not find that it gives nearly as much sensitiveness as can be obtained with wet collodion. Mr. Sutton's theory, that an equal number of atoms of iodine and bromine gives the greatest sensitiveness, may very probably be right; but practically no great nicety is required, as little difference can be perceived in varying proportions between one part of bromide to two of iodide, and equal parts of each. I have generally used from two-thirds to three-fourths.

Finding that the sensitiveness gained by the use of bromide was not so great as was desirable, I have been for a long time endeavouring to find means of increasing it—until very recently with but little success; but at last I have found a method of developing which will bring out a picture after a much shorter exposure than usual, and which promises other advantages. As, however, nothing is easier than to make mistakes in such matters, I delay publishing the method until there has been time to test it further, and to find out the best way of working.—I am, yours, &c.,

Stubbers, Romford, October 21*st*, 1862. T. RUSSELL.

TANNIN PROCESS, &c.

To the EDITOR.

SIR,—I enclose for your opinion a stereoscopic slide from a negative by the tannin process. I have been bothered of late with the collodion rising in blisters and irregular streaks when the plate is wetted after exposure, and, though I have waited a few minutes, the film does not again lie flat. I do not use a coating of gelatine, and should like to do without it. Perhaps you could inform me if ——'s collodion can be used without gelatine? If you do not know much of that maker's, perhaps you would recommend a collodion to me that would be *sensitive* and contract again after being wetted before development.

The plates I have for a long time prepared have been *very* insensitive. The exposure has been, on an average, ten minutes. Last week, however, I lost several plates from *great over*-exposure, although I only gave from three to seven minutes. I got a negative *somewhat* under-exposed in forty seconds. I do not know the reason, unless it be that I used a *very* little honey, and did not wash my plate after exposure in *very* cold water.

You will very much oblige me by making any remarks on the preceding you may think necessary. I shall be anxiously looking for your Journal.—I am, yours, &c., PITCAIRN.

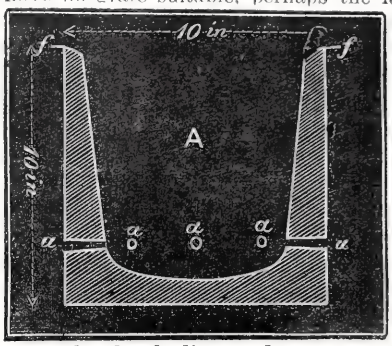
Perth, October 22*nd*, 1862.

[The stereoscopic slide received is *very* good, with the exception of a little too great hardness in the sky; and it would have been an improvement to have included, if possible, the stem of the tree (on the left) the branches of which overshadow the subject of your picture. The general foliage is admirably rendered. We regret much that the specimen has received some little damage by rough usage during transmission by the post. With regard to your collodion, we fear you have scarcely had sufficient patience after wetting the film. Try—waiting longer. The collodion you name is very good, and can be used for stereographic size without a preliminary coating. The extra sensitiveness of your later plates is, no doubt, due in part to the causes you specify. Send us the means of communicating with you direct, and we will forward you a memorandum that you may find useful.—ED.]

DOMESTIC FURNACE.

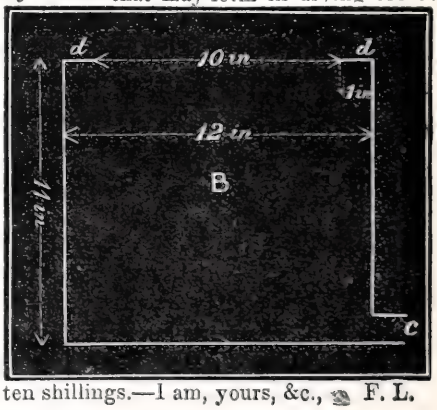
To the EDITOR.

SIR,—As there is some danger of setting the chimney on fire in using a common grate for the purposes of a furnace, and as many modern houses have no grate suitable, perhaps the following description of Septröm's blast furnace may be acceptable to many of your readers:—



It consists of an inner cylinder of sheet-iron, A, having eight small tubes, *a*, inserted in it at regular intervals, and a rim, *f*, at the upper edge; and an outer cylinder, also of sheet-iron, B, having a pipe, *c*, for the entrance of the blast, and an inside rim, *d*, at the upper edge on which the rim *f* of the inner cylinder rests.

The cylinder, A, is to be lined with fire-clay, to the thickness of about an inch and a-quarter, as shown by the shading, and any cracks that may form in drying are to be carefully filled up.



The fuel used should be charcoal, but coke will do: whichever is used it must be broken up to pieces of the size of a walnut.

The blast can be produced by an ordinary domestic bellows; but a fan or a pair of double bellows will be better.

The heat produced in this furnace by a powerful blast is sufficient to melt brass or iron, so that by its means the amateur mechanic may run a small casting. The cost of it is about eight or ten shillings.—I am, yours, &c., F. L.

DR. NORRIS'S PLATES IN INDIA.

To the EDITOR.

SIR,—Can you or any of your readers inform me how the dry plates manufactured by Dr. Hill Norris may be rendered practically available for India, in a temperature ranging from 80° to 110° Fah.? They seem incapable of giving anything save a very indistinct and confused impression, and, upon being treated according to his instructions, invariably blister entirely over their surface. Any suggestion to remedy this will be thankfully received by, yours, &c., AN ANXIOUS INQUIRER.

Bombay, 27th September, 1862.

[We have no doubt that these plates, if judiciously treated, are quite capable of producing good impressions in any climate. We should advise a trial of Major Russell's mode of development—that is, by mixing the restraining acid with the silver solution, which, in a hot climate, should be considerable in quantity, say—

Water	1 ounce.
Nitrate of silver	20 grains.
Citric acid	30 „

This to be added to a simple solution of pyrogallic acid, in small quantities as required.—ED.]

NITRATE OF SILVER.

To the EDITOR.

SIR,—In an attempt to crystallise some silver, I find a quantity passes off as vapour, and is lost; the rest forms a *cake* of nitrate instead of the well-formed crystals to be purchased at any chemist's.

My mode of proceeding was as follows:—A button of silver (weighing one ounce, two drachms, fifty-four grains, recovered from some baths) was simmered in a flask for three hours in three ounces nitric acid and one and a-half ounce distilled water, and then left to cool and crystallise. The following morning I found about an ounce of liquid and a large deposit of a white opaque substance. I again applied heat, and the deposit dissolved; but, after about two hours' simmering, all liquid was evaporated, leaving a very porous substance tinged in one or two places with a very delicate yellow—the yellow *very slightly* tending to green. The heat was then raised beyond boiling point for about ten minutes, to drive off the acid. Now, did I act in a very foolish manner in adding about three ounces nitric acid to wash away the yellow and any other impurity that might be there? Alas! not only the impurities refused to leave, but the nitric acid stayed behind; so I added distilled water until the whole mass was dissolved, and submitted it for the third time to heat until crystals began to form just above water-mark.

The contents of the flask I now emptied into a cup, and placed a piece of filtering-paper over it to keep out the dust. The cup was placed on a high shelf in the kitchen. The thermometer on the same shelf shows sixty-eight degrees; but in the evening, when the fire and gas are lighted, the heat must be considerably more.

At the end of a week a few brown minute crystals formed at the bottom of the cup, and on the surface floated a glassy scum.

At the end of another fortnight or three weeks some large clear crystals formed, and some rough ones also, rising from the liquid to the top of the cup. The paper also became covered and stained, as you may see by the enclosed portion.

It is now about six weeks since the liquid was set aside to crystallise, and although the crystalline mass at the bottom of the cup increases, that on the sides and on the paper continues to thicken; the paper becomes stiff, leaving vacancies between it and the cup; and the nitrate of silver in vapour, doubtless, escapes by that means.

If you would kindly inform me how to put a stop to this sad waste, and how to get well-formed crystals, you will oblige, yours, &c.,

October 21*st*, 1862. LAPIS INFERNALIS.

[You are quite in error in supposing that any nitrate of silver passes off in vapour. You committed an error in covering the vessel with paper of any kind to keep out the dust: it should have been a piece of glass. Your white opaque substance is nitrate of silver, but unfit for a collodion bath in consequence of contamination by the organic matter of the paper; it will, however, do very well for printing purposes. The second addition of nitric acid was, at least, useless. When you have large crystals it is a good plan to wash them slightly with dilute nitric acid before recrystallisation. The original discolouration may have arisen from organic matter having been in contact with the nitric acid—perhaps a cork. It is not easy to produce fine large crystals, except with a large quantity of solution; and, when they have formed, the supernatant liquid should be poured off and further concentrated by evaporation, and again set aside to crystallise.—ED.]

A "MOVE" IN BACKGROUNDS.

To the EDITOR.

SIR,—In the course of my experience, which extends back to when the collodion process first began, I have always had trouble and difficulty with my backgrounds; for I had no sooner got a good one than it either got scratched or spoiled by something. It was a source of continual annoyance, and I dare say most photographers have had the same difficulties to contend with; but I have got over that by a very simple plan. It is this:—I have a frame, covered with drab merino, hung up a few inches from the ground, and when I take a picture I swing it like a pendulum, and the results are that it takes away all marks, and gives a beautiful and smooth surface. The best way is to put a little platform in front, so as to hide the mark at the feet which it would make by swinging. I do not know if the idea is known; but if it is not, it might be of some use to the profession.—I am, yours, &c., P. RALSTON.

Glasgow, October 11*th*, 1862.

TO OUR READERS AND AGENTS.—*Full price will be given by the Publisher for any of the following consecutive Numbers of this Journal, viz.:—Nos.* 158, 159, 160, 161, 162, *and* 163, *being those published between January* 15*th and April* 1*st*, 1862—*both dates inclusive.*

ANSWERS TO CORRESPONDENTS.

R. T.—The plan is "as old as the hills."

A. G. S.—Received and forwarded to Dr. M.

C. ELFIC.—We shall be obliged by the information offered.

SAMBO.—Add a little more acetic acid and your difficulty will vanish.

INQUIRER.—Of course every Daguerreotype is a photograph, but every photograph is not necessarily a Daguerreotype. Photograph is a generic term, Daguerreotype specific.

COLEBROOKE.—The collodion requiring no sensitising bath appears not to have answered, as we have heard nothing more of it than the announcement of its probable introduction.

NOVICE.—We shall best forward your reputation by maintaining a *discreet silence.* Honestly, it would be impossible to award commendation. You have much elementary matter yet to learn.

BON ACCORD.—Received too late for reply in the present number. Had the note been addressed to the Editor, 2, Upper Hornsey Rise, London, N.—as so repeatedly requested—instead of to the Publisher, Liverpool, it would have been in time.

H. R.—We have not seen the envelopes to which you refer, but have little doubt that they can be procured at Messrs. Marion's, in Regent Street, London, as that firm supplies most, if not all, articles connected with photographic stationery.

J. SMITH.—Methylated alcohol is quite unsuited for dissolving the iodides, &c., to add to the collodion, as we have repeatedly stated. Methylated ether is not quite so bad; but it is foolish to employ what must sooner or later injure your nitrate of silver bath.

ORDER.—The gentleman you name has entirely abandoned the practice of the art for a very sufficient personal reason. He would not be pleased were we to give his address. We will undertake to forward a letter if you desire it; but cannot hold out much hope of a reply.

J. HOWLET.—There are several forms of metallic plate-boxes that will answer your purpose. It is advisable to have the lid go far down over the box to secure the non-admission of light. See that the grooves are so arranged as not to tear the film, and have the boxes well dusted out before using them.

ARGENTUM.—You will find Mr. Dawson's table for ascertaining the strength of a nitrate of silver solution in *The British Journal Almanac* for the current year. For a *rough approximation* you may multiply the decimal part of the S. G. by six, regarding the two left-hand figures as whole numbers; but, if you desire accuracy, the table specified will afford it.

O. P.—It is unreasonable to expect that you should obtain a salt that has been twice crystallised at the same rate as that which is a fair remuneration for the crude article. With regard to the firm so bepraised by our contemporary, we know nothing either good or bad respecting it. We do not see any reason why you should not try the firm and judge for yourself.

R. L.—Let the water flow on to the middle of the plate, and run off from each edge by inclining the plate alternately in every direction. By this method you will very rarely disturb the film if it possesses a moderate degree of tenacity; whereas, by allowing the stream to fall on one edge, you are very apt to carry off with it the entire film in one mass. A good pneumatic-holder is invaluable for holding large plates while washing after fixing.

VALENTINE.—1. Thoroughly cleanse your zinc tray, then make it tolerably hot, and coat it with a solution of sealing-wax in methylated spirit. The common *liquid glue* (so called), sold at most of the oilmen's shops, will also answer very well for the purpose of coating the zinc tray. 2. No. 3. For a beginner, it is folly to attempt any dry process until he is quite familiar with the manipulation of wet plates: when he has mastered this, the original tannin or tannin and honey process may either of them be adopted with advantage.

J. B. (Bradford).—We have no recollection of the subject of your communication to which your note of the 23d ult. (sent in error to Liverpool) refers as having preceded that one: our correspondence is so extensive that it is impossible to bear in mind such matters. The page to which you refer in our Vol. VIII.—viz., 263—does not help us, for we find nothing but leader paragraphs therein. Excite your paper in the ordinary way, and then expose it, when dry, to the fumes of some liquid ammonia, in a saucer, just before exposing it for printing.

R. GILL.—Dissolve about a drachm of sulphide of potassium in an ounce of water, and add the solution gradually to the old hyposulphite of soda so long as a brown precipitate is produced. Dry and pulverise the precipitate and rub it up in a mortar with twice its weight of nitre. Make a common crucible hot, by placing it in a clear fire, and when the bottom of the crucible has become red hot, throw in, little by little, your mixture, when deflagration will ensue at every addition. Wash the fine network of silver which will be found with dilute hydrochloric acid, and it will be fit for reconversion into the nitrate.

JOHN WHITESIDE.—We do not think the process you mention the *best* dry process, though certainly a very good one. In fact, we are scarcely prepared to assert which is the best dry process. However, you will find full instructions for its practice, together with that of other good processes, in Hardwich's *Manual*, sixth edition. There is a short abstract of the process in *The British Journal Almanac* for the current year. You will find also full details of the original process in Vol. VIII., No. 151, of this Journal; and various modifications in the same volume, Nos. 137, 141, 144, and 146. We are not aware of the existence of any pamphlet devoted exclusively to the particular subject.

☞ *All* EDITORIAL *Communications,* BOOKS FOR REVIEW, *&c., should be forwarded to the Editor,* GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 178, Vol. IX.—NOVEMBER 15, 1862.

Photographic Carbon Printing.—The subject of photographic carbon printing has once again been resuscitated, and an appeal made for the suffrages of photographers in its favour—in tones somewhat defiant it is true—by its enamoured votary, Mr. Pouncy, of Dorchester, at the opening meeting of the present session of the Photographic Society (London), a report of which meeting will be found in its usual position in our columns. It is much to be regretted that its advocate did not content himself with simply drawing attention to the advance which he has, or fancies he has, made towards perfecting the process which he follows, as he would then have possibly enlisted some sympathy in his cause; but in response to his somewhat illogical and defiant challenge to Colonel Sir Henry James and others to come forward and tell how to produce half-tone, he met with well-deserved rebuke. Mr. Pouncy was evidently well satisfied with his own productions, and claimed to have solved the problem of the attainment of half-tone in carbon proofs from ordinary photographic negatives; but those gentlemen who have been working at photolithography and photozincography have, for the most part, candidly admitted the incapability of their respective processes in their present condition for the production of half-tone, and therefore the sarcastic demand for information on that point was simply an absurdity. We presume, however, that such demand arose from the announcement made in *The Times* of the 4th instant by Colonel Sir Henry James, that he had ascertained the possibility of the production of half-tone with the bichromate of potash and gelatine as a fact, effected by the simple expedient of keeping the prepared paper for some longer space of time than usual between the preparation and exposure of the same. In order to avoid the promulgation of a claim more ambitious than has been announced, we reproduce the letter, which is as follows:—

Sir,—I shall be glad to be allowed to announce, through the columns of *The Times*, that we have accidentally made the important discovery that the paper prepared with the bichromate of potash and gum only, as described in the work *On Photozincography* lately published by Messrs. Longman and Co., will, if only kept for a week or ten days in the dark, yield half-tones, and consequently give us lithographic or zincographic prints from any photograph.

I enclose two copies of a print produced in this manner, which, although not so perfect as we can undoubtedly make them, will prove that the object so long sought after has now been attained.

I am, Sir, your obedient servant,
HENRY JAMES, Colonel Royal Engineers.

Ordnance Survey Office, Southampton, Nov. 3, 1862.

No doubt the foregoing will set experimentalists at work again. But we scarcely perceive the relevancy of Mr. Pouncy's demand after the statement above made of the mode in which the desired end is to be brought about; and we must add, for the encouragement of those who may be inclined to imagine that Mr. Pouncy has left nothing more to be accomplished in this direction, that they need have no fear of the supposed solution of the problem if the specimens exhibited were the best proofs obtainable of the assertion made—the fact being that they were remarkably deficient in half-tone and altogether sombre, not to say dingy-looking specimens, and, unless our memory is very much at fault, not at all superior to the best of those exhibited by the same operator several years ago. It is certainly not with any pleasure that we record this our conviction. We would very much rather have congratulated Mr. Pouncy on his success had he attained it, and we could then have passed over in silence the ungraceful manner of its announcement; but when the excuse of success is altogether wanting, we cannot regard the extraordinary scene of which we were a spectator in any other light than as highly offensive and utterly to be condemned.

Since writing the foregoing we have corresponded with Colonel Sir Henry James on the subject of his later discovery, and he has, in the most courteous manner, favoured us with such particulars as will enable our readers to test the value of this important step in the scientific branch of our art for themselves, accompanied by two specimens that far surpass anything of the kind that we have hitherto seen, exhibiting not only many different degrees of tone, but what is of more importance, *gradations* of half-tone, that are unmistakeable, and which, though at present are not equal to fine silver prints, testify to the probability, not to say certainty, of this desirable consummation being attained by a little further intelligent application of manipulative skill. In conclusion we annex Sir Henry James's communication, as follows:—

Sir,—I have great pleasure in complying with your request for further information respecting the methods employed to produce half-tones in photozincography, than is given in *The Times* of the 4th instant. The first print for transfer was made on Saturday, the 1st of November, and I had it transferred to zinc on the following Monday morning, and sent two copies of it to *The Times* by the morning post, with the note which I wrote in a hurry to save the post, in which I inadvertently said the paper for transfer was coated with bichromate of potash and *gum*: I should have said *gelatine*, as described in the work *On Photozincography*, lately published by Longman and Co. The paper so prepared must be kept in the dark for a week or ten days: at all events, it was with paper so kept that we made the discovery. But I think it very probable, that if the paper was exposed in a room, with a plate of ground-glass over it, for a minute (more or less), that the same result would be obtained. The paper requires to be exposed *rather longer under the negative to produce the half-tones* than to produce the lines of a photograph of an engraving, and the washing off of the ink requires to be more delicately and carefully handled, removing it slowly, and frequently soaking the paper at intervals. Still the whole operation is very rapid and simple. The cost of the material is not one penny, and the time required to produce the transfer about ten minutes or a quarter-of-an-hour. I send you a copy of the print I sent to *The Times*, you will see that the photograph was not a good one; but this print is valuable, as being the first ever printed in this way. I am now having transfers made from a photograph of myself, a rather difficult subject, as I was dressed in a dark blue regimental coat, the shades upon the folds of which I need not tell you are very deep. I am also having some transfers made from some calotype negatives, taken by Mr. Murray, in Egypt, and which he has been so kind as to lend me for the purpose. With these I hope to show the application of the art of photozincography to the production of prints in permanent ink, of portraits, and views of all kinds. It is not to be expected that we can carry the art to the perfection of which it is susceptible; but in the hands of the photographers of this country, I expect soon to see it make rapid strides towards perfection.

I am, sir, your obedient servant,
HENRY JAMES, Colonel Royal Engineers.

Ordnance Survey Office, Southampton, Nov. 10, 1862.

Photography and the Copyright Act.—When any industrial occupation becomes frequently heard of in our courts of

law, we may be pretty sure that the fruits arising therefrom are valuable in a commercial sense, and that they are such as to interest more than a small section of the community. Litigation in connexion with the products of our art is now becoming more and more common—a very convincing proof of the progress it is making.

M. E. Gambart, a printseller and publisher, recently summoned before the police magistrate, at Bow-street, two photographic printsellers for selling copies, produced by means of photography, of certain engravings, the copyrights of which are invested in the former. The proceedings in this case have given rise to a leading article on the subject in the *Daily Telegraph*, in which the facts are detailed and the question discussed somewhat at length; and, as we deem both of interest to our readers, we reproduce the article in another column.

We apprehend that the point of law involved is simple enough, and that the defendants have been guilty of a vulgar piece of roguery; but there is one point in the narrative which is worthy of attention. The complainant stated that the issue of photographic copies of his engravings almost immediately brought the sale of the latter to a full stop. Now, as printing from an engraved plate is supposed to be absolutely cheaper than the production of a photograph of the same size, it is clear that the economy is all on the side of the engraving, so far as the printing of each single copy is concerned; but of course each copy has to bear a portion of the cost of engraving the plate itself, and, further, of the sum paid to the artist for his share of both mental and physical labour expended. It can therefore only be by evading the two last-named items that the photographer can undersell the printseller. Of course, if the size of the picture is materially reduced in the photograph, it is possible to produce the latter, copy for copy, at as low, or at perhaps even a lower, cost than the former; but in that case the degree of competition between the two would be very materially lessened.

We have been informed, however, by a very competent authority—one who deals in both photographs and engravings—that he can frequently sell a photographic copy of an old or inferior engraving at a higher rate than he charges for the original, and this to purchasers who would not buy the engravings at any price at all. Again, there are many persons who actually prefer reduced copies of fine engravings as a mere matter of convenience. We can easily imagine the temptation to a skilful photographer, with a strong admiration for works of fine art, to make for himself copies of expensive copyright engravings, if he has the chance—especially if his pecuniary means forbid his indulgence in the luxury by ordinary purchase—and this many would do, without even a thought that they were committing a fraud; yet such, in fact, would be the case, for not only would he be acquiring his copies without contributing his share of payment to the several parties interested, but, unless he were to destroy his negatives, he would leave it in the power of others to defraud still further by an unscrupulous use of them. Now, it does seem a great pity that the use of an art like our own, which can so readily minister to the gratification of a taste for the beautiful at small cost, should be unduly restrained in its application; and the consideration then arises whether it may not be possible to unfetter the one, yet with due regard to the rights of another. We think this may be accomplished, and with profit to the owners of copyright in works of art, if they will enter into an arrangement for the purpose.

Supposing they do not themselves care to publish photographic copies of their works (of course if they do there is no difficulty in the matter), and some photographer applies for permission to do so, they have only to *give him an order* to take a negative *for them*, a proof from which may be registered under the new Act, having with a device, signature, or monogram impressed upon it. They have only to dictate that every copy printed from the negative shall be brought to them to be stamped, and then make a charge of so much per copy as royalty thereon. It might be considered by some as dangerous to sanction the production of proofs by any persons beyond their own immediate control; but we apprehend there would be ample security, partly from their being forewarned of the existence of a negative, and partly because any possessing negatives would be interested in assisting to prevent others from obtaining an undue advantage over themselves, while the existence of any proof without the impressed stamp would at once be evidence of its being contraband. We do not imagine that many collectors of engravings would abandon them in favour of photographic copies, because those who are able and content to pay a high price for the former know well enough how to distinguish fine copies from inferior ones, and to appreciate the difference thoroughly, although it may be scarcely perceptible to the uninitiated; but these last do not spend large sums for that with which they are contented, and, in fact, those who buy cheaper copies rarely possess more than a few of them. But there is another class to be supplied, the members of which at present purchase neither kind of engraving, for the reason that their taste demands the costly ones which their pocket cannot afford, while it turns with disgust from those which it can. To this class photographs from good specimens would indeed be a boon; and the profit to the possessors of the copyright by ministering to this want would, we have little doubt, be considerable, and in addition to that they at present reap.

We cannot perceive any reason why arrangements might not be made to allow several photographers to reproduce the same engraving upon the same terms, so that a very extended circulation might be anticipated. We fancy that there is profit to both photographers and owners of engravings in this suggestion.

Royal Condescension.—Most of our readers will remember that, not long after the decease of His Royal Highness the late Prince Consort, an action was brought against Mr. Vernon Heath, of Piccadilly, for the recovery of two negative portraits of the lamented Prince; and in the evidence given at the trial of the action it was elicited that four negatives in all were taken, and were disposed of according to the directions of Her Majesty the Queen, one of them having been specially retained for her own private use. The late Prince Consort was Patron of the Photographic Society, and the Council, being desirous of presenting to each member of the Society a memorial of one who took so deep an interest in the progress of our art, and did so much for its advancement, very recently applied to the Queen for permission to have a sufficient number of copies printed, *from her own negative*, of the deceased Prince, for the purpose of carrying out their desire by distributing them amongst the members of the Society. To this request Her Majesty has, with her usual condescension, and in the most gracious manner, acceded. Through the courtesy of Dr. Diamond we have been favoured with a sight of the letter from Colonel Phipps, conveying the intimation of Her Majesty's kind acquiescence in the request, a copy of which we append:—

Buckingham Palace, November 9th, 1862.

Sir,—I have had the honour to submit your letter of the 6th instant to the Queen.

I am commanded to inform you that Her Majesty willingly sanctions the presentation to each member of the Photographic Society of a photograph from the negative of Mr. Vernon Heath, of the Prince Consort, who was the Patron of your Society.

I have the honour to be, Sir,
Your most obedient humble servant,
Dr. Diamond. C. B. PHIPPS.

London Photographic Society's Exhibition.—The International Exhibition having prevented the holding of the Photographic Society's annual display this year, the Council has determined to resume the usual course early in January next, when the Annual Exhibition of the Society is to take place—not in the old *locale* in Pall Mall (which will not again be available for this purpose), but at the Suffolk-street Gallery. The Council has also resolved upon awarding a medal and a series of prizes for the best pictures in the various classes of photography.

ON DEVELOPMENT BY AMMONIA.

By Major Russell.

Some time ago, in the hope of shortening the exposure of dry plates, I tried the effect of hot water and hot developing liquids in various ways, but the results were not very satisfactory. An image can be thus developed after a shorter exposure than is necessary in the ordinary way, but there is a great tendency to fogging, and the image is entirely superficial, being built up with loose particles of silver, which can be removed by drawing the finger across the surface when dry. On the whole it seems almost impossible to produce a really good negative in this way.

Having read the accounts from America of fuming dry plates with ammonia, I next set about examining the capabilities of this agent, and during the last six weeks have made a great number of experiments with, to say the least, very promising results. Although I cannot yet give precise directions as to the best way of working, yet some account of the matter, with the principal precautions necessary to guard against failure, may be of interest to those who are experimenting in the same direction.

Thinking that the developing action of the fumes of ammonia must be due to their action on the tannin, the first thing I did was to try the effect of mixing a small quantity of ammonia with a solution of pyrogallic, which is much more unstable. The liquid showed no immediate effect, but changed colour slowly in much the same manner as if nitrate of silver and acid had been added. On mixing the pyrogallic and ammonia, and immediately pouring it on an exposed plate, its developing action is very energetic, not only bringing out the image after very short exposure, but even in some cases producing a considerable although insufficient amount of intensity, which can very easily be increased to any extent by redeveloping with pyrogallic and acid silver. Ammonia will develop a picture by its action on tannin, if the exposure has been long enough, but it must be much longer than is required when pyrogallic is used in the same way.

The principal precautions necessary are:—1st. That too much ammonia be not used; one drop of the strongest solution usually sold, in four ounces of water, generally seems to be sufficient, with a few drops of strong alcoholic solution of pyrogallic added to the portion to be used. There appears to be considerable latitude in the proportion of ammonia; but if too much is used, the liquid becomes strongly coloured very quickly, the high lights start out at once with some intensity, but the other portions of the plate show nothing but brown discolouration. 2nd. That the alkaline and acid developments be kept quite separate; the plate being thoroughly washed under a stream of water after the former. If this is neglected the picture will be entirely spoiled.

When these precautions are observed, this method appears to be easy and certain, and the picture is very bright, clear, and free from loose deposit, much more so than when the ordinary plan is adopted with an under-exposed plate. The image is entirely in the film, and shows little or no dulness of surface on any part, even when the exposure has been as short as possible to produce a tolerable picture.

These facts appear to throw doubt on the correctness of some of the commonly received opinions as to the nature of the developing action. The effect does not depend on the presence of nitrate of silver, for pyrogallic and ammonia will succeed on a plate which has been immersed for some time in a very strong solution of salt, after the latter has been removed by copious washing and long soaking.

It is hardly safe to venture an opinion as to the theory of the matter in the present state of our knowledge; but it seems to me that the decomposition of pyrogallic darkens the bromide or other insoluble salts of silver which are in contact with the impressed iodide. If this be so, it may account for the strongly accelerating effect of bromide on dry plates without nitrate, when used in a much larger proportion than would be advantageous on wet plates from which the nitrate is not removed.

Photography in Ecclesiastical "High Places."—We are glad to see it announced that the Right Rev. Dr. Thomson, the Lord Bishop of Gloucester and Bristol, is about to be translated from his present diocese to the higher sphere of the Archbishopric of York. It will be in the remembrance of our readers that it was only last year we referred to Dr. Thomson's appointment to his present bishopric. We notice this ecclesiastical preferment owing to the circumstance that his lordship is an enthusiastic amateur photographic worker. The Archbishop-elect has long been a subscriber to The British Journal of Photography.

ON SOME OF THE DIFFICULTIES CONNECTED WITH THE PRACTICE OF PHOTOLITHOGRAPHY.*

By J. W. Osborne, of Melbourne.

In a paper read by me at the Meeting of the British Association of this year at Cambridge, I gave exact directions for the execution of my photolithographic process, in as concise a manner as was consistent with a proper elucidation of my subject. On the present occasion I respond to the flattering request of Dr. Diamond to continue the topic in a short paper before the Photographic Society, and I request the members to consider the few observations I have to make as supplementary to the paper just referred to.

Foremost among the difficulties which beset the operator engaged in the reproduction of drawings and engravings should be enumerated the circumstances affecting the production of a good negative. I have already referred to the importance of this first step in the process, and explained my method of "clearing up," and pushing the development, with a view to obtain contrast upon the glass; but more yet remains to be said upon this theme alone than I can possibly find space for within the limits of the present communication.

It must be obvious to all that the quality of the negative depends, first of all, upon the original from which it is taken. A drawing from which a very tolerable silver print copy can be made will not unfrequently cause the photolithographer much difficulty, which he is conscious of when endeavouring to produce a negative suitable for his purposes. This depends to a certain extent upon the peculiarities of the process, but chiefly upon the fact that we apply quite a different criticism to artistic productions emanating from the press and to those from the pressure-frame. In the one case we expect perfect cleanliness, sharpness, and solidity; in the other we are satisfied if the general effect upon the mind is such that we are forcibly and irresistibly reminded of the original. To secure, then, a good negative, the design to be copied, if drawn by hand, must be executed in a certain style, which will not be invariably followed by draughtsmen, unless their attention is particulary directed towards it; and this is true of those who work mechanically with the drawing-pen and scale as well as of persons engaged in the essentially artistic expression of their conceptions.

That the acquisition of a good method of drawing is no insurmountable difficulty, is established by the success which has attended the introduction of improved systems into the Ordnance Map Office at Southampton, and the Survey Office in Melbourne. In the last-named department, the improvement in the character of maps, and plans generally, has been very considerable, and is, quite independently of photolithography, a great boon to the office. I may add that some of the reproductions of pen-and-ink sketches, which I exhibit, are from originals which leave nothing to be desired.

The object which the photolithographer should have in view, is not only to reproduce existing originals of convenient and suitable size; but, abstractly, to bring the quality of his work, whenever that is possible, up to that of the best lithographic productions drawn by hand. And while I admit that the copy of an indifferent sketch, etching, or ancient manuscript, may, from circumstances connected with its history, or from other causes, be a legitimate and useful application of the art, I am still of opinion that, until the excellence of ordinary reproductions by this means is ensured by adopting the necessary precautions as regards the original, photolithography will not take the honourable place it is destined to fill among the graphic arts.

Up to the present time, the draughtsmen and artists have drawn with the knowledge that they were to be followed by the engraver, whom they not unfrequently regarded as a mechanical man whose business it was to set all right and give finish and uniformity of style to their productions by his rendering of them. The draughtsman (and I refer more particularly to the compiler of maps, and to the producer of mechanical drawings and designs) has now to remember that the line he draws, and the word he writes, will be printed as he renders it, and that its ultimate quality depends, in the first instance, on him.

If it leaves his pen as a ragged broken scratch, it is out of the question to transform it by the application of any amount of care or cleverness into what it ought to be. Photolithography has not yet passed into general use. As far as practical results are concerned, its adoption has been almost restricted to one or two Government departments; but its extension is inevitable; and for publications by its means, a number of originals have yet to be drawn, greater I would hope, than the vast store of time-honoured manuscripts and engravings which the past has so temptingly provided for us.

* Read at a Meeting of the London Photographic Society, November 4, 1862.

It is to point out the necessity for the maintenance of a correct style, and plain and firm work, that I have urged this subject upon your notice on the present occasion. The chief and leading error which ordinary draughtsmen commit is the use of pale grey ink for all fine, delicate, or distant work. Such ink flows more easily through the pen, and the work, when finished, has a softer effect, owing to the fact that a grey line looks finer than a black one, and the imperfections of such a line are not so readily seen. When the photographer endeavours to copy such a drawing in the camera, he experiences much difficulty in making from it a negative of the requisite quality, because a long exposure, desirable for the sake of getting intensity, which would easily be borne by the blacker and heavier part of the work, is sure to cloud over with a considerable deposit the paler and fainter lines. Unless this cloudiness can be totally cleared away, it prevents such lines going down on the stone with firmness and solidity.

Depending upon the converse of this state of things for its explanation is the fact that engravings are, as a rule, much easier to reproduce than drawings by hand, the fine and distant work upon such being produced, not by paler, but by finer lines and markings, with larger spaces between, than are let remain in the foreground and shadows.

Let us now consider how far it is possible for the photolithographer to equal the lithographer in the quality of his work. If, without reduction, we copy a well-executed map from stone or copper, using the best instruments, the purest chemicals, and the greatest care, all that it is within the bounds of possibility to obtain is a *facsimile* somewhat inferior to the original in quality. How much inferior, depends upon the process, and upon the operator; and the constant endeavour of the latter will be to reduce that quantity to a minimum; but, however much he may exert himself, a difference will always exist.

If we now suppose that the engraving or drawing is fitted for reduction, and that the operator, taking advantage of this, diminishes the copy in size, we shall find that the results may be a finished work, quite equal to, or even superior to the original in excellence,—this result depending upon the fact that, when the minute imperfections of a drawing are reduced beyond a certain limit, they cease to be observed by the unassisted eye, and for all practical purposes cease to exist. It is by availing ourselves of this beautiful power of the camera, that decided superiority may be obtained by the judicious employment of photolithography. At the same time it should be remembered that the camera never changes the general character of a drawing, but only refines upon it, and that an original, the several parts of which are out of keeping with each other, and wanting in finish, will never, by any amount of reduction, be made to produce a pleasing effect.

A just appreciation of this subject is one of such paramount importance to the future of photolithography, that a short treatise on it, appropriately illustrated with originals of various kinds and qualities, accompanied by their reproductions, both good and bad, on various scales, might be written with much benefit to the rising generation of draughtsmen and artists.

Leaving this topic, I wish to draw your attention to one cause, which I am convinced militates more frequently than is generally believed against the production of good negatives. The disturbing influence to which I refer is vibration. This may exist either in the camera, in the original to be copied, or in both; and its amount may be quite imperceptible to the senses, and yet be productive of much mischief. The tables upon which cameras are placed, the floors upon which they rest, the plan-boards to which originals are attached, and the methods employed to secure them are rarely as firm and solid as they ought to be.

When we consider that the image of a fine line upon the sensitive collodion has only to oscillate to the extent of one-fourth its own width (equal to about $\frac{1}{700}$th of an inch) during a long exposure of three or four minutes, to take much from its sharpness and delicacy, the importance of adopting sufficient means to ensure stability will be manifest. On this account alone, if other reasons were wanting, I object to copying in the open air; for there are few days so still and free from wind, on which a slight tremor is not imparted to the instrument or plan-board; and I prefer to sacrifice a portion of the light, for the sake of securing perfect rigidity.

In concluding this paper, a few words on the nature of the difficulties affecting the production of photolithographic half-tone may not be out of place, as they will also serve to explain one of the chief uses of my "clearing up" process, the object of which, as I have already mentioned, is to obliterate half-tone, and to make the greatest amount of contrast to be obtained by subsequently pushing the development.

The gradation in tint observable in impressions from a lithographic stone are invariably found to possess a certain definite structure; that is, a shade is composed of a systematised arrangement of perfectly black markings of more or less determined form, separated from each other by clear white blanks and spaces. The distinctive characters of lithographic drawing depend chiefly upon the form of these markings, while the differences in depth of colour and tone depend upon their size and proximity.

Thus we have crayon drawing, stippling, cross-hatching, and ruling, which are some of the methods employed to produce shadows of varying depth; and however even and soft the tints produced by these means may appear to the casual observer, they will each be found, upon close examination, to possess a certain characteristic form. Further, a little consideration will show that, while the printer works with an *opaque* ink, the colouring matter in which is carbon, and while it is only possible to prepare the stone in such a way as either to *take* or *reject* the ink on different parts of its surface, middle tints must continue to be constituted in a manner resembling that I have described. Now, in the negative picture from natural objects, we have no structure, all its shadows are simply the result of the action of varying amounts of light, and the particles of opaque solid matter deposited in the film are so minute as to defy detection and isolation, even with a high magnifying power. Here, then, is the difficulty. To give structure to these shadows, to express them on the stone in a manner more or less conventional, to print them by a mechanical process on paper, and still keep up that delicacy of character which the subtle luminous influence, by its chemical power, has imprinted on the plate, is the great problem to be solved.

Although, by modifying my process, *half*-tone can be and has been obtained, I cannot say the same of the infinite number of intermediate tints which constitute the charm of a photographic picture. I am confident that it admits of extension in this direction; but want of time has hitherto prevented me from devoting the necessary attention to it. I believe that my predecessors have too ambitiously aspired to the attainment of this most desirable but most difficult object, and that had I followed them in this respect, and not circumscribed my field of operations to the production of simple black and white, my labours would not have terminated so successfully.

I do not doubt that we shall ultimately possess a good photolithographic process, capable of giving half-tone as good as any now obtained from the stone by the ordinary manipulations; but much remains to be done before this is accomplished. It should also be borne in mind that it is not sufficient for the stone to furnish one or two good proofs: the quality of the work upon it must be such as to supply an indefinite number, if the method by which it was produced is to be of practical value. Looking at this subject from a business point of view, I think you will agree with me that the quality of future results must closely approximate the perfections of a good silver print before they become commercially valuable.

If, in the ordinary application of my process as I have described it, a portion of the work to be copied is washed in with a brush, or faintly drawn with pale ink or pencil, we obtain a negative which exhibits corresponding half-tone. Now, the question may be asked—Why does not this print from the stone as a tint? The reason of its not doing so will be readily understood if we remember that the means by which the superfluous ink is removed from the transfer paper, after the blackened print has been sufficiently soaked, is a mechanical one, and deals roughly with the particles of matter (if I may be allowed so to express myself), compared with the delicate deposition and removal of atoms by chemical agency. If, then, the portion of the positive print sunned under half-tone in the negative has sufficient affinity to retain the ink, it retains a homogeneous and connected coating, which transfers to the stone as a solid patch of greasy matter, which will print black. If, on the other hand, the gelatine has not been sufficiently altered, the sponge removes the ink from such under-exposed places, clearing it right away, or at best leaving a broken line or shadow, composed of inky patches which darken (if the transfers be effected to a smooth stone) with every impression taken in the press. Such results, save in as far as they can be made instructive by the investigator, are utterly worthless; and yet I take this opportunity to express my firm conviction that lithography, partly on account of its chemical character, and partly because of the excellent half-tone which the stone may be made to yield, is better fitted for union with the photographic art than are any of the other means of producing artistic works in the press, such as engraving, or surface-printing.

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.*

By Emerson J. Reynolds.

The detection of the acid constituents of a compound, though easily accomplished, cannot be attempted in so systematic a manner as in the course of testing for the basic groups. We are obliged to rely somewhat more on the application of special re-agents as a means of discovering the nature of an acid than is desirable; however, many acids, both organic and inorganic, can be classified in such a manner as to admit of their easy separation. The acids, the properties of which we propose discussing, are derived both from the mineral and vegetable kingdom, and are therefore divided into two great sections—the inorganic and the organic. The inorganic acids are—*sulphuric, sulphurous, hyposulphurous, carbonic, hydrosulphuric (sulphuretted hydrogen), hydrochloric, hydriodic, hydrobromic, hydrofluoric, silicic, nitric, chloric, phosphoric,* and *boracic.* The organic acids which we shall treat of are—*tartaric, tannic, gallic, pyrogallic, citric, benzoic, acetic, hydrocyanic, formic,* and *oxalic.*

Before subdividing each of these sections into groups, it will be necessary to examine the deportment of each with warm and concentrated *sulphuric acid.* If the subject of the analysis be a liquid, we must ascertain by the use of test-papers whether it is acid or alkaline: if acid, it must be rendered neutral with ammonia, and then evaporated to dryness; if alkaline, it may be at once evaporated, and a portion of the dry mass thrown on the surface of some hot oil of vitriol placed in a capsule over a spirit-lamp. The result of this treatment on the mineral acids is shown in the following statement:—

1. Acids volatile without decomposition:—*Carbonic acid,* inodorous. *Sulphurous acid* (from sulphites), odour resembling a burning match. *Sulphuretted hydrogen,* odour of rotten eggs. *Hydrochloric acid,* pungent acid vapour fuming in contact with air. *Nitric acid,* almost colourless acid gas. *Hydrofluoric acid,* irritating vapour, which corrodes glass.
2. Acids volatilised with decomposition:—*Sulphurous acid* with separation of *sulphur* from *hyposulphites. Hydriodic acid,* beautiful violet vapours of *iodine. Hydrobromic acid,* brown vapours of *bromine. Chloric acid,* deep yellow gas.
3. Acids non-volatile at the temperature of warm sulphuric acid:—*Silicic, boracic, phosphoric,* and *sulphuric.*

If we now turn to the organic acids, we find that they are likewise divisible into two classes—those volatile with decomposition and without.

1. Acids volatile without decomposition:—*Acetic acid,* recognised by its odour. *Benzoic acid,* volatilised in white fumes, which condense on a cold surface, at the same time evolving the peculiar odour of the acid.
2. Acids decomposed by the oil of vitriol:—*Tartaric, gallic, pyrogallic,* and *tannic acids* are immediately decomposed with the separation of *charcoal,* which floats on the surface of the acid: at the same time carbonic acid, carbonic oxide, and sulphurous acid are evolved. *Citric acid* is only blackened after some time. *Formic* and *hydrocyanic acids* do not blacken, but are resolved into pure carbonic oxide, which burns on the surface with a pale blue flame. *Oxalic acid* is broken up into carbonic acid and carbonic oxide without blackening.

It will be easily gleaned from this summary of the action of strong sulphuric acid on the electro-negative or acid element of salts, what valuable information the application of this simple test is capable of affording us. When taken in connexion with our previous knowledge of the basic constituents of a solid or liquid under examination, this is very frequently sufficient to give us a good general idea of the nature of the acid present—at least it requires us simply to apply corroborative tests in order to obtain positive proof of the truth of our surmises. It may not be at first apparent to the junior student how far an acquaintance with the bases present in a solution helps to point out the acid; but a moment's consideration will show that no acid can possibly exist dissolved in the liquid which would form, with any of the metallic oxides present, a compound insoluble in water. For instance, if silver is found we can then say positively that neither boracic, carbonic, hydriodic (iodine), hydrobromic (bromine), hydrochloric (chlorine), hydrosulphuric, oxalic, phosphoric, pyrogallic, silicic, sulphurous or tartaric acids can possibly be present in a neutral solution. In order to render this fact of more value to the student, and as a convenient reference to our readers generally, we subjoin a list of acids in alphabetical order, having appended to each a carefully compiled list of the metallic oxides with which it forms neutral compounds, soluble or insoluble, as the case may be, in distilled water. If the number of soluble salts formed are in the minority, they are specified; whereas, if the insoluble compounds are the smaller number, they are enumerated, the remaining compounds with all other bases being respectively insoluble and soluble. It is necessary to premise that many of the salts set down in the table as insoluble are readily dissolved by an excess of acid; therefore it is essential to ensure the removal of any free acid by neutralisation before proceeding with the analysis. There are likewise many neutral bodies which are not absolutely insoluble in water, but have about the same degree of solubility as sulphate of lime: these are printed in italics.

NAME OF ACID.	SALTS FORMED.
Acetic	All soluble.
Benzoic	With peroxide of iron, sub and protoxide of mercury, and oxides of tin, lead, bismuth, *uranium,* and *copper.* Insoluble.
Boracic	With alkalies and suboxide of mercury. Soluble.
Carbonic	,, alkalies. Soluble.
Chloric	All soluble.
Citric	With lime, baryta, alumina, and *oxides of zinc,* lead, *silver, uranium, cadmium,* and sub-oxide of mercury. Insoluble.
Formic	,, oxides of *cobalt, nickel,* and *sub-oxide of mercury.* Slightly soluble.
Gallic	,, oxides of *magnesium,* tin, bismuth, lead, copper, and peroxide of iron, alumina, and sub-oxide of mercury. Insoluble.
Hydriodic	,, mercury (two oxides), *lead,* silver, copper, bismuth, and platinum. Insoluble.
Hydrobromic	,, *lead,* bismuth, silver, and sub-oxide of mercury. Insoluble.
Hydrocyanic	,, the alkalies, lime, *baryta,* magnesia, and oxide of mercury. Soluble.
Hydrochloric	,, silver, lead, and sub-oxide of mercury. Insoluble.
Hydrofluoric	,, oxides of tin, bismuth, uranium, silver, platinum, antimony, and chromium. Soluble.
Hydrosulphuric	,, the alkalies and baryta, strontia, and lime. Soluble.
Hyposulphurous	,, *baryta* and *magnesia.* Almost insoluble.
Nitric	All soluble.
Oxalic	With the alkalies, peroxides of iron, *uranium,* chromium, and *antimony.* Soluble.
Phosphoric	,, potash, soda, and ammonia. Soluble.
Pyrogallic*	,, oxides of lead, uranium, tin, bismuth, copper, and antimony. Insoluble.
Silicic	,, potash and soda. Soluble.
Sulphuric	,, baryta, strontia, oxide of lead, and *lime.* Insoluble.
Sulphurous	Sulphites of the alkalies are the only ones very soluble.
Tannic	With oxides of lead and antimony, and *baryta, strontia,* and *lime.* Insoluble.
Tartaric	,, potash, soda, ammonia, and oxides of chromium, aluminum, cobalt, antimony, copper, and sub-oxide of mercury. Soluble.

* Pyrogallates of the noble metals are said not to exist, since the pure metal is always precipitated on mixing the solutions.

We must now endeavour to classify our acids. The first and most obvious division consists of those which are liberated in the gaseous state on the addition of a stronger acid at ordinary temperatures. This group comprises *carbonic, hydrocyanic, hydrosulphuric, sulphurous, and hyposulphurous* (evolving sulphurous acid with deposition of sulphur) acids; and, on *gently* warming the mixture, *acetic* and *formic* acids are driven off.

The second group is tested for by adding *hydrochloric acid* and warming, to expel the members of the first group. The excess of acid is then neutralised very carefully with *ammonia.* Now, on the addition of *chloride of barium,* the baryta salts of the following acids are thrown down:—*Sulphuric, boracic, phosphoric, oxalic, hydrofluoric, silicic, tartaric,* and *citric acids.*

The third group contains the acids precipitated from *acid* solutions by *nitrate of silver:—Hydrochloric, hydrobromic, hydriodic,* and *hydrocyanic* acids.

The remaining acids—*benzoic, chloric, gallic, pyrogallic, formic, acetic, nitric,* and *tannic*—cannot be conveniently classed, and must usually be sought for specially.*

(To be continued.)

Photographic Postage Stamps.—The new trade in those novel historic chronicles, the postage stamps, has so increased of late that clever forgeries by the aid of photography are said, by one of the dealers whom we recently met, to be by no means uncommon. Rare foreign stamps will fetch as much as thirty shillings each, and tolerably common ones will command prices varying from sixpence to three or four shillings. One advertiser announces a price-list of six hundred varieties, which he will send free on receipt of a stamped envelope.

* Continued from page 408.

* We have not included arsenious, arsenic, or chromic acids in the classification, for a reason which will be obvious in our next article.

STEREOGRAPHS.

Illustrations of the International Exhibition. Photographed by W. England.

London Stereoscopic Company, Cheapside.

If the budding leaves of spring excite the feeling of hope and pleasure in anticipation, the many-tinted hues of autumn have a charm of their own, embellishing the lingering beauties of the past glorious time of sunshine, and rest on the memory like the last sweet notes of some ravishing melody. Perhaps we value more the autumnal beauties because they hint at, rather than tell of, those of summer; and if they be not quite so intense, they are at least free from the heat, oppression, and glare necessarily accompanying the latter—the light is not so blinding nor the shadows so deep.

Mr. England's stereoscopic pictures of the Great Exhibition of 1862 are to us the autumn leaves as we like to regard them—that is, as links that bind us to the past without remorse, rather than as presages of the coming time of leaden skies and dreary darkness. We don't value "the house that Fowke built" and its contents as a whole, and many of its associations are anything but pleasant, especially those in connexion with the mismanagement under which our own art-science suffered; but we cannot deny the existence of innumerable brilliant gems of art and industry, nor ignore the memory of some pleasant hours spent over them, and we would gladly forget the heaps of uninteresting rubbish, trophies (!) of soap, toys, preserved beef, candles, and the hundred-and-one miscellaneous articles to be met with in any of the ordinary shops, not only of the metropolis, but of every provincial town. We would forget also the closely-packed crowd, the weary waiting to see in turn some favourite object, the stifling heat, the hideous structure itself, the din of the "ringing out," and above all the horrid scrambling, scuffling, worrying job of getting home, with a couple of hours' ride, when thoroughly tired and wanting one's dinner. There were times when it was possible to view even the best things in comfort, and there were not a few things that it was a comfort as well as a pleasure to view. To many of these Mr. England introduces us anew, under no forbidding aspect of a blockade of eager sight-seers, but with a way cleared specially for the favoured spectator, as if he were a noble scion of royalty. We say nothing about the necessity of a clear space in order to be able to appreciate the statuary, as that is self-evident; but many of the smaller articles, beautiful in themselves, receive an added charm of no slight extent by being viewed as grouped in harmonious contrast, and how is it possible so to view them when the spectator is thrust up close against them? Numerous groups of this kind are—or rather were—scattered all over the building, although the grouping of the whole was anything but satisfactory, while some of the courts were little better than miserable dens. Some objects require to be minutely and closely scanned in order to be able to estimate their value (we do not mean commercially), and to this end what can aid us better than a first rate stereograph? It happens that we are able to pick out one specimen that illustrates both of these propositions, viz.—

No. 112, Engraved Glass, Venetian Pattern, exhibited by Naylor and Co. This is a splendid slide. A flower-stand and a water-jug of what is designated as "jewelled glass," of quaint old pattern, are surrounded by vases, goblets, caraffe, claret jug, and wine glasses, of elegant forms and magnificently engraved, the whole of the details of the design being distinctly visible, while the brilliancy of the crystal glass is wonderfully reproduced, and the entire group artistically disposed.

Again: No. 125, Porcelain and Majolica Vases, by Duke and Co., is a marvellously effective slide. The similitude of the ancient pottery is so perfectly accomplished that it is difficult to believe in the absence of colour. Indeed, it was not until we had carefully examined the specimen by daylight, *out* of the stereoscope, that we became thoroughly convinced we had been viewing an untouched copy.

Akin to the foregoing is No. 70, The Austrian Court, representing the stand numbered 1368 in the official catalogue, on which is displayed a magnificent group of ornamental Bohemian glass vases, &c.; but here, though the elegant forms are given, the gorgeous tints of the originals interfere sadly with the photographer—the red, white, and clear glass being duly recorded, but the blues and the gilding, which we know to belong to some of the specimens, and which (knowing it to be there) we can detect by close scrutiny as having produced some effect upon the sensitive film, have not made an impression equivalent to that which they do in nature. It is not so much the absence of colour that is felt in cases such as these as it is the translation of its proper effect into light and shade that is wanting.

As an illustration of the immense value of the stereoscope in presenting the real appearance of objects, No. 96 is noteworthy. On first looking at it in the hand, we mistook it for a group of elegantly embossed silver articles; but the moment it was viewed in the stereoscope, it stood revealed as ceramic ware, being in fact Majolica Ware, exhibited by the Marquis Ginori Lisci, of Florence. They are glorious specimens of this quaint and highly-prized class of productions.

No. 110 represents a Group of Vases, &c., in Dresden Porcelain, in the Prussian Court, that is pleasing both as a picture and as a stereograph. It is, perhaps, to be regretted, that instead of the natural distant background, a plain curtain was not interposed to prevent the eye from trying to penetrate beyond what it is desired to fix the attention upon; but the various peculiarities of the strongly contrasting specimens are well indicated, and the difference between the polished and unpolished surfaces strikingly shown. Space will not permit us to indulge farther in description of illustrations of other kinds of subjects on the present occasion; but we hope to return to the subject in a future number. We can but say, in conclusion, though the number of different views taken is very large, we covet nearly all: they are the productions of a master hand.

ON THE NOMENCLATURE, THEORIES, AND PROPERTIES OF SALTS.*

By James Martin.

The opinion was once entertained by chemists that when an oxide was acted upon by a hydrogen acid, that neither the oxide nor the acid were decomposed, but that direct combination took place; hence arose the names of hydrochlorates, hydrosulphates, and hydriodates.

But a more searching examination has demonstrated that both the oxide and the acid are decomposed, the oxygen of the oxide going to the hydrogen of the acid to form water and the chlorine, iodine, bromine, or whatever salt radical it may be combining directly with the metal. One or two facts may be cited in support of this theory.

Most of the oxides when heated with a hydrogen acid, and the solution evaporated sufficiently to crystallise, yield salts which contain neither oxygen or hydrogen, but the metal only combined with the salt radical. It is also found that when many of the metals are heated in pure chlorine gas, rapid combustion ensues, and salts are obtained identical in composition and properties with those yielded when the oxides of the same metals are treated with a hydrogen acid.

It is true that many of these salts, when crystallised, contain oxygen and hydrogen in the exact proportions to form an oxide and a hydrogen acid, as examples of which the salts of barium, strontium, calcium, copper, and manganese, may be mentioned; but, as the application of the most gentle heat is sufficient to expel them as water, it is quite fair to assume that they exist as such in the salt.

The oxysalts at present are regarded as combinations of oxides with oxyacids, although there is a theory which renders them harmonious with those already mentioned; but, before entering into this theory, it will be necessary to say a few words respecting the acids which enter into the composition of this class of salts.

The greater number of those bodies which have been termed oxyacids have never been isolated, and we are supposed only to know them in combination with water or a base; thus what is termed nitric acid $N O_5$ cannot exist alone, but when in combination with water it constitutes one of the most energetic acids known. Oxalic acid, again, cannot exist in the anhydrous state; for, immediately on abstracting the water from it, it is resolved into carbonic acid ($C O_2$) and carbonic oxide ($C O$) gases.

Again, with regard to such compounds as have been described as *anhydrous* sulphuric acid and *anhydrous* phosphoric acid, their affinities for bases are very different to those of their aqueo-acids. In the absence of all moisture, the anhydrous sulphuric acid has no action on litmus-paper; and these anhydrous compounds certainly do not manifest acid properties at all comparable to that of their combinations with water.

Proceeding upon these facts, Sir Humphrey Davy clearly pointed out that we have no certainty that the hydrated sulphuric acid really contains water, or the sulphate of soda oxide of sodium; and that, instead of the formula $H O S O_3$, we might, with better

* Concluded from page 410.

reason, adopt the formula H, SO_4 for the acid, which would thus be considered a hydrogen acid, differing from hydrochloric acid only in containing a compound radical (SO_4) instead of a simple one (Cl). But, in the first place, chlorine may not be really a simple body; and, secondly, if it were so, we know that compound radicals exist, performing exactly the part which is here ascribed to the hypothetical body, SO_4.

Cyanogen is an instance of this. It is a compound (C_2N) which forms with hydrogen hydrocyanic acid, H Cy, which acts on bases exactly as hydrochloric acid does, forming a neutral salt (a cyanide) and water.

Now, let us assume in all these cases, as well as with the hydrogen acids, that it is the hydrogen which is the acidifying element, and observe how close a parallel may be drawn between the action of hydrochloric acid and that of sulphuric acid on the metal zinc and its oxide. When hydrochloric acid acts on zinc the metal is dissolved, chloride of zinc is formed, and hydrogen liberated. When the same acid is brought into contact with oxide of zinc the same salt is formed and water produced. In the case of sulphuric acid and zinc, instead of supposing that the *water* yields its oxygen to the zinc and sets hydrogen free, let us suppose that it is the hydrogen of the acid which is *replaced* by a metal, and being set at liberty is given off in the gaseous form, and see how exactly each corresponds. Again: when sulphuric acid is made to act on oxide of zinc, we may regard the action the same as takes place when hydrochloric acid is made to act on it—the hydrogen of the acid taking the oxygen of the base and forming water, and the SO_4 combining directly with the metal.

The combination SO_4 may be regarded as a radical capable of being substituted for the elementary substances, chlorine, iodine, bromine, &c. It is true that these oxygen radicals have not been isolated; but this difficulty is no greater than we are driven to in the opposite hypothesis of the dry acids. It is evident that the same view is applicable to the hydrated oxygen acids in general, which may be made hydrogen acids, by assuming the existence of a new radical for each containing an atom more oxygen than the oxygen acid itself, and capable of combining directly with hydrogen and the metals.

But there are certain anhydrous bisulphates and bichromates—such as bisulphate and bichromate of potash—which, in a measure, tend to disprove this theory; and, until these are more satisfactorily accounted for, it would be unwise to adopt it.

Moreover, some new nomenclature would have to be adopted for this class of salts, which would be attended at first with great inconvenience; but it certainly has the advantage over the old theory in this—that, instead of two, it makes but one great class of salts; and it accounts for the remarkable fact, that, *in neutral salts, as many* equivalents of acid are required as there are of oxygen in the base—a fact which is not explained by the old theory, whereas it becomes a necessary sequence in the new, since it is obvious that, to form water with the oxygen of the base, an equal number of equivalents of hydrogen must be derived from the acid.

In this simple way the absurdity of having two different explanations for the same phenomenon is avoided, and the following general definitions of an acid and a salt arrived at:—

AN ACID *is the hydrogen compound of a simple or compound radical, possessing the power of neutralising bases; and its general formula is H R.*

A SALT *is the compound formed by replacing the hydrogen of an acid by a metal; and the general formula for a salt is M R.*

We will now, in conclusion, consider the general properties of a few classes of salts.

SULPHATES.—The salts of sulphuric acid in solution are characterised by the production of a white precipitate, on the addition of chloride of barium. The precipitate so produced is sulphate of baryta, which is insoluble both in acids and alkalies. Several sulphates occur in nature; but the only ones which are abundant are the sulphates of lime, baryta, and strontia. The solubility of the sulphates is very variable. There are only six which may be regarded as insoluble, viz., the sulphates of baryta, tin, lead, antimony, bismuth, and mercury. The sparingly soluble sulphates are those of strontia, lime, and silver. All the others are soluble in water. All the sulphates (those of potash, soda, lithia, baryta, strontia, and lime excepted) are decomposed at a red heat. One part of the sulphuric acid escapes unchanged, and another portion is resolved into sulphurous acid and oxygen. Those which are most readily decomposed by heat yield the largest quantity of undecomposed sulphuric acid. When a sulphate is ignited with carbonaceous matter, the whole of the oxygen is abstracted, carbonic oxide (C O) and carbonic acid (CO_2) being disengaged, while a metallic sulphide remains.

NITRATES.—All the nitrates are decomposed, without exception, at a high temperature; but the changes which take place are modified by the nature of the oxide. Nitrate of palladium is decomposed at such a moderate heat that a great part of the acid passes off unchanged. Nitrate of lead, on the contrary, requires a red heat, by which it is resolved into oxygen and nitrous acid. In some cases the changes are more complicated. With nitre, for example, nitrite of potash is at first formed, with escape of oxygen gas; as the heat increases the nitrous acid is resolved into binoxide of nitrogen and oxygen, the former of which remains in combination with potassa; the binoxide is then resolved into protoxide of nitrogen and oxygen—the former being retained by the alkali; and, lastly, nitrogen gas is disengaged, and peroxide of potassium remains.

As the nitrates are decomposed with great facility by heat alone, it will be readily imagined that the decomposition proceeds with redoubled energy under the united influence of heat and combustible matter. Accordingly, it will be found that the nitrates are, on this account, much employed as oxydising agents, and frequently act with greater efficacy than nitro-hydrochloric acid (NO_4 Cl.). Nitrate of potash is the salt generally employed for this purpose, and the efficiency of this salt depends not only on the affinity of the combustible body for oxygen, but also on that of the oxidised body for potash.

The process of oxidising bodies by means of nitre is called deflagration, and is generally performed by mixing the inflammable body with an equal weight of nitrate, and projecting the mixture, by small portions at a time, into a red-hot crucible.

The only nitrates found native are those of potash, soda, lime, and magnesia.

Nearly all the nitrates are anhydrous and all are soluble.

PHOSPHATES.—There are three different hydrates of phosphoric acid, and each hydrate is the type of a different series of salts, which are distinguished as monobasic, bibasic, and tribasic. All the tribasic phosphates having one atom of base and two atoms of basic water are soluble in water, and redden litmus-paper—whence they are commonly called superphosphates. The tribasic phosphates, except those of the pure alkalies, are either sparingly soluble or insoluble in water, but they are all dissolved by diluted nitric or phosphoric acids, being converted into the soluble phosphates. All the tribasic phosphates, with fixed and strong bases, bear a red heat without change. Phosphate of soda is converted successively by the continued application of heat into the basic, and monobasic modification of the salt.

CHROMATES.—The salts of chromic acid are mostly of a yellow or red colour, the latter predominating when the acid is in excess. The chromates of the oxides of the second class of metals are decomposed by a strong, red heat, by which the acid is resolved into the green oxide of chromium and oxygen gas; but the neutral chromates of the fixed alkalies sustain a very high temperature without change. They are all decomposed, without exception, by the united agency of heat and combustible matter. The only native chromate hitherto discovered is the red dichromate of lead.

CARBONATES.—This class of salts is distinguished from others by being decomposed with effervescence (owing to the escape of carbonic acid) by nearly all the acids; and all of them (except the carbonates of potash, soda, and lithia) may be deprived of their acid by heat. The carbonates of baryta and strontia, especially the former, require an intense white heat for decomposition. Those of lime and magnesia are reduced to the caustic state by a full red heat, and the other carbonates part with their carbonic acid when heated to redness. All the carbonates (except those of potash, soda, and ammonia) are of sparing solubility in pure water; but all of them are more or less soluble in an excess of carbonic acid, owing, doubtless, to the formation of supersalts. Several carbonates occur in nature, among which may be enumerated those of soda, baryta, strontia, lime, magnesia, manganese, iron, copper, and lead; together with some double carbonates, such as dolomite, the double carbonate of magnesia and lime, and the double carbonate of baryta and lime.

CHLORIDES.—Most of the metallic chlorides are soluble at common temperature. They are fusible by heat, and under favourable circumstances crystallise with regularity on cooling. Several of them—such as the chlorides of tin, arsenic, antimony, nickel, and mercury—are volatile, and may be sublimed without change. Two only of the chlorides are insoluble in water, namely, chloride of silver, and the di- or subchloride of mercury: several, such as the chlorides of antimony and arsenic, are decomposed by water, but most of them are more or less soluble in that liquid.

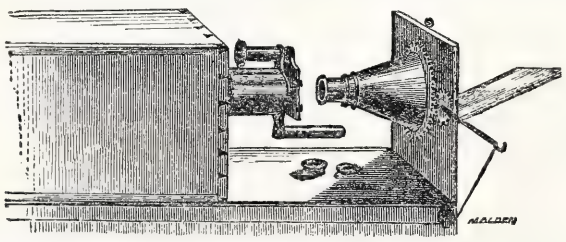
International Exhibition.

THE PHOTOGRAPHIC APPARATUS AND APPLIANCES.*

By Samuel Highley, F.G.S., F.C.S., &c.

Next in order, according to the Official Catalogue, come our own contributions to the World's Fair. These comprised copies of the two works in which the first attempts were made towards the adaptation of photography to book illustration, viz., part 3 of vol. I. of the *Quarterly Journal of Microscopical Science*, for 1852-3 (a pet child of our own, which we had, at the date given, recently started on its literary career), and the first edition of Unger's *Ideal Views of the Primitive World, in its Palæontological and Geological Phases*, edited and published by the present writer in 1854. The first work contained two enlarged photographs of miscroscopic objects, taken by the late Joseph Delves† both subjects being printed on one page, together with the "imprints" common to lithographic and metal-plate prints, at one operation, so as to save the extra trouble and expense of mounting the positives in the ordinary way—a matter of much importance when one thousand copies of the work had to be ready for distribution by a certain day, and at a period of the year when the weather is usually dull and uncertain, viz., the end of March. The method adopted is fully described in the part of the work referred to; but we were much amused a short time since to find that Mr. Burnett had brought our plan before a society, and claimed it for himself as *a novelty!* As an instance of the manner in which the Jurors of Class XIV. performed their duties, we may call attention to the fact that they awarded a medal "for the adaptation of photography to book illustration," to a well-known photographic firm that exhibited in their case a copy of a work published by Messrs. Smith, Elder, and Co., (who were not the exhibitors!) and yet took no cognizance of our own claims in this direction, though we had made the matter *un fait accompli* some ten years previously! But then it is likewise a fact that the Jurors had awarded us an "Honourable Mention" before they had made themselves acquainted with the contents of our case!!! But in this respect we did not stand alone.

Besides these works we exhibited a series of transparent positives of scientific and artistic subjects, specially photographed for the Magic Lantern, so as to render that instrument one of real educational value. This series included enlarged photographs of microscopic objects, treated as lantern views, that being the only way in which such subjects can be greatly amplified on a screen without distortion. In the way of apparatus we exhibited a photo-micrographic camera, with solar condenser, lenses, and appliances



for taking enlarged photographs of microscopic objects, with a voltaic stage for killing zoophytes, &c., when in an expanded state. As this arrangement has been described in No. IV. of the *Microscopical Journal*, and in Dr. Lionel Beale's works on the *Microscope*, it is needless to enter into detail here.

Our *pièce de résistance*, however, was a Photographer's Actinometer, of which however only a model to illustrate *the principle* of construction was exhibited. By this arrangement may be estimated the time of exposure for any light, object, colour, or combination of colours, by any lens or process at any hour of the day.

This contrivance consists of two parts, viz.,—the "test object" and the "mercurial shutter."

The Test Object consists of a frame divided into compartments by deep moulded beads, so as to render "light and shade" and "high lights." Between these are placed velvet or silk ribbons, selected so as to afford types of the principle colours of the solar spectrum.

The Mercurial Shutter consists of an iron frame fitted with two plates of very colourless glass (actinically), in such a way as to leave a slight space between them. In the upper part of the frame is a reservoir to contain a sufficient amount of perfectly pure mercury to fill the interspace between the two glasses. A groove passes from this reservoir down the side and under the floor of the frame, in which perforations are made so as to break up the body of mercury as it flows between the glasses, and make the metallic fluid rise in a steady and even manner. An iron stopcock retains the mercury in the upper chamber.

Method of Use.—The mercurial shutter slides in a groove immediately in front of a sensitised plate placed in the ordinary plate-frame, and can be adapted to any camera. When in place, the stopcock is connected by a crank with a shutter that uncovers the lens in such a manner that when the exposure is made the stopcock is turned, and the mercury instantly begins to rise between the glass plates, and of course gradually shuts off the sensitised plate from the object; thus it will be seen that while the lower part of the plate is *under-exposed* the upper part will be *over-exposed*, and between these two points will be one that has had the *proper amount of exposure*. To determine this, the plate is then developed, and placed over a graduated scale that indicates seconds and half-seconds (in fact the shutter is a mercurial clock, similar to the water time-keeper used by the Romans). It will then be perceived *which part of the scale* corresponds with *the best rendered portion of the photograph*, and the proper time of exposure for a given object will be indicated. Immediately after the "trial plate" is taken the subject proper is to be photographed—the shutter being first removed, which on being reversed allows the mercury to return to its reservoir, when it is shut in by the stopcock till required for another trial plate.

It will be seen that this arrangement provides for every requirement. It will probably be more used by experimentalists than by the experienced operator. *A practical actinometer* has been a thing sought for; it is believed that this arrangement solves the problem as far as such appliances ever can be "practical." At any rate, it gives the information *at the time required*, instead of (as in all other actinometers I am acquainted with) twenty-four hours (or longer) after it is wanted.

Besides these, we exhibited an improved portable developing stand; a pneumatic plate-holder, that gives greater control over the plate, and prevents the patches of irregular development which sometimes occur in warm weather when the hand is placed beneath the plate; a model of a very solid form of operating-room stand, with mechanical adjustments; a model of a portable background, suitable for amateurs, as it can be placed on a lawn, as well as in a room; and a portable developing-lamp, and developing dropping-bottle for nitrate of silver, &c., which have previously been described in these pages.

Messrs. Hockin and Wilson exhibited their very compact and ingeniously-contrived developing tent; their instantaneous shutter bath-tester; samples of their collodion, in hermetically-sealed tubes, for its safe transportation to tropical countries; and a very complete set of apparatus and chemicals, packed in a travelling laboratory, very suitable for persons resident in the country, or those travelling about from place to place. All of these arrangements have, however, been described in the previous volumes of this Journal.

Messrs. Horne and Thornthwaite contributed a series of their well-known cameras; but we may call attention to an arrangement in their *carte-de-visite* cameras worthy of attention, simple though it be. Where four portraits have to be taken by a "repeat" action with a pair of lenses, the plate-frame is so constructed that the upper part of the plate is the first portion exposed, for the reason that it is the part that dries soonest, while the lower part is kept moist by the tendency of the silver solution in that direction. The lenses supplied with this camera, have a diameter two and three-eighths inches and five inches focus. To meet the fashion of making the stereoscopic camera likewise serve the purpose of a landscape camera, Messrs. Horne and Thornthwaite have introduced a very useful form of lens, and at a moderate price, which they call a "Panoramic" Lens, as it gives a picture of seven and a quarter inches by four and a half, and embraces an angle of fifty-three degrees. It must not, however, be confounded with that of Mr. Sutton's construction; for it is made on the ordinary principles, the alleged increase of angle being obtained by the employment of a glass different in character from that ordinarily employed in the construction of photographic lenses. The diameter of this lens is one one-tenth inches, and the focus five inches, and the pictures produced are such as are desired by the amateur photographer when taking a jaunt into the country with a view to bringing home mementoes of travel.

Mr. Leake, jun., exhibited one of his well-known portable tents; but, unfortunately, it had been constructed of such bad materials that on first seeing it we fancied it was a large model of a "saddle-

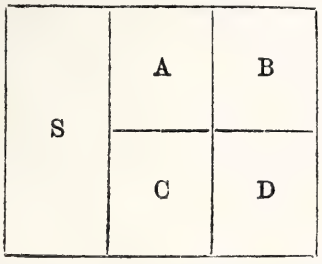
* Continued from page 414.

† We were recently much grieved to see a notice of the death of this talented gentleman on board ship, in the tropical regions,

shaped" crystal of calcite that had strayed out of the adjoining Educational Department. The sample exhibited might curtly be described as of the Leake-leaky, whether regarded from a photographic or meteorological point of view.

Mr. LICKLY exhibited a camera, with a combination of a funnel and a hay-chopping machine arrangement for shielding and exposing the lens.

Messrs. MCLEAN, MELHUISH and HAES exhibited a fine collection of their universal objectives and their metal cameras of various sizes. The novelty in their collection was a *carte-de-visite* camera of four lenses, with an arrangement for securing an instantaneous exposure at the moment when the object (child, animal, &c.) was in the best position of rest. This was secured by a simple but very ingenious way, viz., by the addition of a supplemental lens and focussing-glass placed beside the lenses and plate-holder; thus when the plate-frame is in position, with the shutter drawn up and the four lenses covered, the focus is taken on the supplemental focussing-glass by aid of the uncovered supplemental lens, and when the object presents to the observer a favourable opportunity, the four lenses are uncovered by aid of a mechanical arrangement at the back of the camera. This contrivance will be best understood by aid of the annexed diagram—



A, B, C, D represent the compartments pertaining to the four lenses, and S the supplemental focussing-screen. As the four portraits are taken on one plate, of course all the five lenses must be of exactly the same focus.

Messrs. MURRAY and HEATH exhibited a remarkably fine collection of field and operating-room cameras, and of the apparatus and appliances required by the photographer, whether at home or *en route*, comprising carefully-selected forms which combined all the latest improvements. The chief novelty in this collection was a large bellows-body copying camera, in which the ordinary mode of focussing was dispensed with, the adjustments being effected by means of a graduated brass rod fixed upon a pivot, placed so as to properly intersect a large Dallmeyer's triplet; and according to the size required the negative is first placed so as to correspond with a given number on the scale. The brass rod is then turned over to the side on which the copy is to be taken, and the collodion plate likewise made to correspond with a given number of the scale. If this form of camera be properly constructed, it greatly facilitates the operation of enlarging or reducing pictures from a negative. Besides these instruments, an improved form of lenticular stereoscope, and also a reflecting stereoscope on the principle of Helmholtz's telestereoscope for combining large views without reversing the image, was exhibited by this firm, or rather by Mr. Charles Heisch, who is now its sole representative.

(To be continued).

POLITICAL PHOTOGRAPHY.—Truly the art we represent seems universal in its influence and applications. We have just been reading sundry scraps of information which, combined with others of a similar description, shows us that photography is acquiring no mean repute as a political agent. In Rome the coachman of Miss Cushman (the actress) has been thrown into prison, and property left in his charge endangered, and all because the poor fellow had written letters to Turin, was in possession of two microscopic photographs of Garibaldi, and had on his person a receipt for a subscription of one paul to the Cavour memento! The Italian correspondent of one of the daily newspapers again informs us that "the agents of Muratism, availing themselves of the general discontent, are about to try their hands at a grand *coup*," and adds:—"This much is certain, that photographs of the Prince and his son have been circulated in the teeth of the authorities, and in spite of the state of siege, both in the towns and in the provinces during the last few days" (dated November 3rd). Perhaps it was not without good reason that the ex-king Bomba banished photography from his dominions.

PHOTOGRAPHY AND THE COPYRIGHT ACT.*

AFTER teaching the wind to drive his ships, the water to bear them, the fire to subdue and mould his metals, the beasts of the earth to do him "homage and service," and the steam, which is but the cloud of the skies super-heated, to whirl himself and his machines about, Man has trained the sun to be his portrait-painter and arch-artist. Like all good servants, too, light has been shamefully tasked. It has been set to reproduce lofty things, and things of low estate—themes of thrilling sylvan or rural beauty, and pot-house interiors—the divine Diana of the Greeks, and the shameless guiltinesses of Holywell-street. "Didst ever see Titan, pitiful-hearted Titan, kiss a dish of butter?" asks prince Hal in the play. Titan, in our time, has had many such a vulgar employment; and the result is the infinite reduplication of endless types of physiognomy, grand and greasy, and grades of art mean and majestic. The last appearance of "light" is in the character of defendant in a police-court. The radiant offender has, it appears, been reproducing, with his usual perfect counterfeit of line and shape, some of the engravings of Mr. Gambart, the printseller; and that gentleman has cited light, in the person of Messrs. Powell and Pipere, photographic artists, to answer for the misdemeanor. Mr. Gambart owns, among many other popular and beautiful pictures, *The Horse Fair* of M'dlle Rosa Bonheur, and *The Light of the World*, an equally well known labour of a name as great in art. For the picture and copyright of *The Horse Fair* he had given the sum of £1,600, besides paying £800 for the engraving made after it by Mr. Landseer. This engraving—the admirable result of great talent and pains—was naturally a favourite, and its sale was in a fair way to repay the publisher's outlay, when photographic copies of the work made their appearance in the windows of the two photographers named. Mr. Gambart assured the magistrate that the sale of the print was checked at once; and, unless the prohibition against such rivalry on the part of the indefatigable and unerring sun were enforced, he intimated that his business, and that of others similarly engaged, must come to an end. The presiding magistrate has reserved his decision—rather, as Mr. Gambart pointed out in a recent letter to us, upon technical grounds, than upon the question whether such ingenious piracy is to be held legal or illegal. But as everybody knows the pictures in question, and most people of any taste or information in the way of art are familiar with the engravings and their photographic *replicas*, the case really rises from the insignificance of an alleged misdemeanor to one whose decision must have a great deal to do, not only with the future of photography and its professors, but with art generally.

In the first place it is not to be denied that these heliacal forgeries of Mr. Gambart's property and of other such engravings are very beautiful and perfect. They lack the value of the original, principally because the scale is smaller, and in point of colour, too, the doubtful browns of photography cannot match the clear whites and blacks of a steel plate. But the first objection could easily be removed by a new process lately patented; and as to the last, the collodion in the hands of a skilful manipulator is capable of giving tints of uncommon depth and equality. Thus the photographs are real as well as pretended rivals of the engravings; and indeed that point is sufficiently settled by the desire of the public to possess them. The first inclination of that public naturally is to get good works of art at little cost. If it cannot afford the picture, it secures a proof engraving; if that be beyond its means, it contents itself with one "after letters;" and in default of the necessary guineas for such a purchase, the photographer's copy is prized and paid for. Our honest art-loving public will probably therefore set its sympathies at the outset rather against the printseller. Why should it not have perfect duodecimal copies of great works of art for half-a-crown or a shilling? What dog-in-the-mangerism forbids it so cheap and charming a boon? It begins to feel almost a grudge against Mr. Gambart, and his grievance, like that instinctive indignation which is excited in its bosom when it hears of him as summoning his subscribers to witness the utter demolition of some beautiful and costly steel plate, which has worked off these engravings. Such might, they think, even after its first crispness of line, have furnished many a lowly home with a work of art, passable in respect of completion always, and lovely in design and outline. And this destruction of it, when the cruel cold chisel ploughs up the cunning labour of the "burin," does indeed seem outrageous, and an act of Vandalism. But let us be just to others before we are generous to ourselves. It would be delightful, doubtless, to all, and welcomed by the printsellers themselves, were the art of Holywell-street and the Seven Dials driven out of the field by artistic works engraved or photographed after the best masters. But art is jealous, and jealous also are its votaries, so that one of them will often be rendered miserable if, having a "gorgeous Titian" or "glowing Claude," any one else shall possess even a *replica* of the illustrious canvas. This benevolent feeling equally applies to engravings: subscribers to a plate will not be enchanted, however much their better feelings may be appealed to, with the idea that their choice proof is to have ten thousand "dittos" in the country. Unless they get guarantees to the contrary in some such way as the demolition of the plate they will simply decline to ally themselves with the artist's enterprise; and there would be no engraving to multiply. So, too, with regard to the much-debated photographs. Setting aside the slight fact that Mr. Gambart, having given £2400 for his property, has the right to do what he pleases with it, one thing is very evident—if photographers may seize

Daily Telegraph.

upon the first proof engraving they can get of any popular picture, and stop the sale of engravings made after it by their "negatives," there is an end to that special art. The dealers in prints will no longer produce an article which does not pay; and, as the photographers will have nothing to copy, we shall get neither picture, nor plate, nor photographic reduplication.

Copyright must therefore be respected, on economical as well as equitable grounds. The public as well as the publisher is served by a strict regard for the law upon this head. But, at the same time, it is so highly desirable that good art, at a low price, should irrigate—should deluge, if possible—the country, that we should despair to think that the interests of the photographer and the publisher could not be reconciled. We believe they might, and by some of the numerous suggestions made on the kindred subject of patents. A royalty on the right to make duplicates for sale of any work of art the subject of a copyright—with some reductions, let us suggest, in the present exaggerated price of good engravings—might meet the difficulty. At present there are two things certain: first, that photography must not expect to thrive upon the profits of the enterprise which gives its subjects; and, secondly, that the public will not be contented to have a beautiful and fertile field of art shut out from photography like a hayfield in summer-time.

In connexion with the preceding, the following appeared in several of the daily newspapers:—

Copyright in Engravings.—On Saturday Mr. Corrie delivered his judgment on the points of law which he had reserved for consideration in the case of Mr. Sydney Powell, charged with infringing Mr. Ernest Gambart's copyright in the engraving by Mr. Landseer of Rosa Bonheur's celebrated painting, *The Horse Fair*.

Mr. Corrie said there were in this case two summonses, one for copying or causing to be copied, and the other for exposing copies for sale without the consent of the owner of the copyright. The evidence was that a person, called as a witness, purchased a photograph copy of the engraving of *The Horse Fair* at the defendant's shop. The complainant was also called, and proved that he was the owner of the copyright, and had complied with all the technicalities of the Act so as to bring him under its protection. Now these proceedings were brought under the provisions of the 25th and 26th Vic., c. 38. which by its eighth section provides that all penalties imposed by certain former Acts might be recovered before two justices. This was one of the Acts passed in consequence of the 23rd Vic., cap. 43, which enabled magistrates to deal with several matters not formerly within their jurisdiction; and if they committed any mistake there was an appeal to the judges, thus securing two advantages which had hitherto been believed to be incompatible—good law and cheap law. Now as this act provided a new way of enforcing penalties, it was necessary to see what those penalties were. The act of the 8th George II., cap. 13, sec. 1, in substance gave to the original engraver of any design a copyright for 14 years, with penalties for infringement against any person who, without the consent of the owner, should engrave, etch, or in any other manner copy, or who should print, reprint, or import for sale, or knowing the same to be so printed should sell or expose for sale any copies of such copyright design. A few years afterwards, in the seventh year of the reign of George III., was passed the Act on which this case must be decided. After re-enacting, almost in the same words, the provisions of the former Act, it provided that if any person should engrave, etch, or work, or cause to be engraved, etched, or worked, a design taken from any ancient or modern picture or sculpture, he should be protected in the same manner as for an original design; and the copyright both of the original engraver and of the person causing an engraving to be made was extended to 28 years instead of 14; and if any person should engrave, print, or publish copies from the copyright work, they were liable to the same penalties as under the former Act. But in setting forth what persons should be liable to the penalties it omits to mention any person who should sell or expose for sale. It was rather curious that he should now, after nearly 100 years, be called upon for the first time to put a construction on this Act, the point having never been raised till now. It was contended for the complainant, ingeniously enough, that he was entitled to recover under the words of the Act, "that any person who shall engrave or cause to be engraved any print, &c., shall have the benefit and protection of the said act in like manner as if any such print had been engraved or drawn from the original design of such graver." But under this Act proceedings could be taken by a common informer; and though in the present instance the proceedings were taken by the person who was entitled to the protection and benefit of the Act, that might not be so in all cases. Supposing, then, that the proceedings should be taken by a common informer, it would be rather a strained interpretation to say that he was to recover the penalties under those words. But it went further, for after the clause about the benefit and protection, to show that it was not considered that the penalties had been enacted, section 5 proceeds to impose the same penalties as in the former Act, but omitting the third provision with reference to selling and exposing for sale. It might be said that the words must have been intended to be repeated, and that it never could have been designed to let the seller go unpunished; but even so, he did not feel justified in importing into the Act words which were not there—the judges had so very distinctly declared against importing into any Act of Parliament words which were not there. If he were to express his own opinion, he should guess that they were left out by mistake. Still he certainly could not insert them, especially after a lapse of nearly 100 years. It was probably on account of these difficulties that the Act of the 17th George III. was passed, which cited that the intention of the legislature had not been carried out. Under that Act it was not even necessary that the vendor should be shown to have known that the copy was sold without the owner's consent. There was no doubt that Mr. Powell had committed a wrong, and that there was a remedy against him, but it was not under the penalties imposed by this Act. He had, therefore, come to the conclusion, though somewhat reluctantly, that the summons must be dismissed.

Mr. Bowen May said it was much to be regretted that the Act giving power to proceed before justices would be rendered practically inoperative by this decision. The Act had been passed in mercy to many poor people who could not pay the heavy costs of an action in the superior courts. It was thought desirable to give a cheap remedy by which persons in Mr. Gambart's position could protect their rights without utterly ruining those against whom they were compelled to take proceedings. Now they had no choice but to proceed in the superior courts.

Mr. Corry said they had a cheap and summary remedy in the county court. The remedy under the 17th George III. was by action on the case, and all such actions could now be taken in the country.

Mr. Bowen May said that five of his clients who had thousands of pounds invested in high-class prints had actions pending in the Superior Courts at present.

Mr. Corrie: You must succeed in the action. But in the proceeding here you would have to show, even if I had settled the main point in your favour, that the defendant knew the work to be copyright. Of that there was no evidence whatever: so in any case I must have decided against you. But in the superior courts you do not require to show knowledge.

Some conversation followed on the defects and inconsistencies of these Acts of Parliament, and Mr. Bowen May said that several members of parliament were resolved to bring in an Act to amend them next session.

Mr. Corrie then dismissed the summons, recommending that in the present state of the law the publishers should take the civil procedings, under which success was certain.

In reference to this subject we also give the following letter, containing information we are very glad to receive, and with which we conclude our extracts:—

TO THE EDITOR OF "THE DAILY TELEGRAPH."

Sir—I have read with much interest your able leader on photographic piracies; and you will perhaps allow me to add a few lines on the subject. Publishers are aware of the public demand for a class of small and cheap reproductions of popular engravings and pictures; and, as in the case of cheap books, some of them are already in the habit of issuing successively, or conjointly with their large engravings, small *replicas*. Messrs. Goupil give you generally the choice between their two guinea prints, or ten guinea proofs, and photographic reductions at 5s. and 1s. 6d. I may perhaps some day go further, and, discarding my one thousand subscribers at fifteen guineas, court the patronage of a million at one shilling, when I see that the shilling will produce the large total. My objections are not to photographic and cheap editions. Let all encouragement be given to the photographer who works in broad daylight for a lawful purpose. Let him compete with cheap prices against the more aristocratic pretensions of those who cater only for the wealthy. But I protest against the photographer who works in hiding, and skulks with his wares to the shops of poor people who are ignorant of the danger they run by dealing with him, or to those who are his dishonest associates; and to such the law must mete out due award.

You mention the *Light of the World*. No engraving ever produced met with greater success; and by many clergymen and gentlemen having observed how desirable it would be that such a work should be within the reach of a much larger class, I was on the point of commissioning Mr. Morelli to engrave a small plate of it in line, when a multiplicity of photographic piracies made their appearance; and the cheap market being already supplied very extensively, I gave up the project for the present. The fame of the English school of engraving has been raised to the highest point by such men as Hogarth, Woollett, Strange, and Sharp, and is worthily maintained in the present day by such artists as Doo, Robinson, Lumb, Stock, Watts, Wilmore, Goodall, Wallis, Cousens, Landseer, Lewis, Ryall, Barlow, Simmonds, and many others; but, as you well say, where will they get employment if publishers find their anticipated harvest snatched away when ready for gathering?—I am, Sir, yours, &c.,

French Gallery, 120, *Pall Mall, Nov.* 6. E. GAMBART.

Micro-Photographs.—Once upon the subject of photography, another novelty in that line, just brought out in Germany, may be recommended to the attention of amateurs. The sweethearts of fatherland are just being made happy by the production of miniature stereoscopic portraits, no larger than a pin's head, though rendering the features of the beloved object with all the accuracy of the ordinary *cartes de visite*. A lady true to the choice of her heart may carry the portrait of the fortunate knight in a shawl pin or betrothed ring, with all the publicity and secrecy demanded by love and bashfulness combined; while her squire may raise his favourite cigar-holder to a higher object of worship than heretofore, by studding it with the fair lineaments of his beloved. It is only necessary to carry a pocket microscope to enjoy the otherwise invisible likeness, and magnify an unmeaning speck into features eloquent with life and love. After this nothing remains for aged aunts, and other dragons of the duenna species, but to give up the work of detection in despair, and avow at last that the world is too many for them. To complete the utility of the invention in this line of art, love-letters may be prepared, in which an inexpressive blot upon a blank sheet of paper can contain untold worlds of unfathomable affection, and glowing assurances of perfect devotion.—*Daily Telegraph*.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

The first meeting of this Society for the session 1862-3 took place on Tuesday evening, the 4th instant, at King's College,—Francis Bedford, Esq., occupying the chair.

The meeting was numerously attended, and an unusually large collection of photographs were sent by various gentlemen for exhibition. Foremost among these may be mentioned Mr. England's stereographs of statuary and works of art in the International Exhibition. The high degree of merit attained by Mr. England in this branch of our art is now so well known as to make any extended notice of his productions unnecessary in this place; it is sufficient to say that the choice collection shown at the meeting commanded even more than its usual share of attention.

The London Stereoscopic Company exhibited also some of their larger specimens, the subjects being in many instances the same as the stereographs by Mr. England.

Mr. Ross contributed a varied assortment of *carte-de-visite* portraits by Bannister, Ruff, Dean, and Macnab, illustrating the capabilities of a lens manufactured expressly for that class of portraits. Mr. Ross was also the bearer of a very interesting series of six photographs, about twelve by ten inches, showing the progress of the destruction of the tower of the church of St. Martin, at Courtrai, sent by Mr. Sherrington, and photographed by M. Debets, of Courtrai. The destruction of the tower was caused by lightning, which brought about the ignition of the combustible portion; and the series of photographs, taken at short intervals during the burning, illustrated the rapid progress of the devouring element.

Mr. Warner, of Ross, showed a large album, capable of holding 250 *cartes-de-visite*, eight being arranged on one page, and the leaves being double. This book was designed by Mr. Warner, specially for his album views—an application of the *carte-de-visite* size of photographs to landscapes first publicly introduced by that gentleman, and, we believe, originally suggested by the Editor of this Journal. Mr. Harmer exhibited a book containing some photographs, both landscape and portrait, printed on paper albumenised on both sides, and surrounded by borders of various depths of shade and shape, obtained by the use of masks during the process of printing. Mr. Harmer showed also six chromo-photographs, *i.e.*, photographs printed on paper tinted by means of lithography, and subsequently albumenised: these two books were briefly described by Mr. Martin, who handed them round for inspection by the members.

Messrs. Horne and Thornthwaite exhibited two negatives, and a proof from one of them, to illustrate the suitability of their bromo-iodised collodion for taking foliage and kindred subjects. The object chosen for this purpose was a very beautiful branch of holly, remarkably full of berries. The result obtained bore favourable testimony to the quality of the collodion.

Mr. C. Jabez Hughes, who has succeeded to the business of the late Mr. Lacey, of Ryde, Isle of Wight, contributed some specimens of his skill in *carte-de-visite* portraits, and it was gratifying to observe that the specimens shown were calculated to support the reputation established for the Ryde Portrait Gallery by Mr. Lacey.

Mr. Cooper exhibited some remarkably beautiful photographs on white resinised silk (an application of his resin printing process), which were very generally admired.

The following gentlemen were balloted for and duly elected members of the Society:—Messrs. J. W. Osborne, of Melbourne; J. J. Reeves, of Plymouth; Charles Heisch, of Piccadilly; John Clarke, of Astley Castle; — Mayland, of Cambridge; and — Hale, of Eastbourne.

The Chairman, on taking his seat, expressed his regret at the absence of the Lord Chief Baron on that the first meeting of the Society; he had been, however, prevented from attending by press of business in Court on that day. He (the Chairman) would endeavour to perform the duties of the office to the best of his abilities, though he could not but wish that his place had been more worthily occupied. He then called on Mr. J. W. Osborne to read his paper *On Some of the Difficulties of Photolithography*. [See page 425.]

Mr. Osborne illustrated his very interesting communication by a large collection of maps and other photolithographic reproductions. Among these two maps were specially noticeable as illustrating the economy effected by adopting the photolithographic method of multiplying copies. One, reproduced in the ordinary way, had occupied three days and a half, and cost £3 9s. 5d.; while the photolithograph of the same subject was produced in two and three-quarter hours, at a cost of 6s. 6d. Another large map of Victoria was shown, of the dimensions of 5 feet by 4 feet, costing 42s., which had been successfully reduced to half that size, and was offered to the public at 6s. Mr. Osborne showed also a collection of prints by the processes which were allied in their nature to the process of photolithography, namely, Mr. Fox Talbot's photoglyphography, Herr Pretsch's photogalvanography, Mr. Pouncy's carbon process, some of M. Barreswil's productions, and also some most brilliant photolithographs by Mr. Ramage, of Edinburgh, and by Dr. Hochstetter, of Vienna. These specimens were examined with much interest. At the conclusion of his paper, Mr. Osborne expressed the gratification which it afforded him to have the honour of addressing the Society at so great a distance from the place where the labours he had described were carried out.

The Chairman having invited discussion on Mr. Osborne's paper,

Mr. Pouncy advanced to the table, and in a somewhat irrelevant manner urged the claims of his carbon process, by which he stated he could produce any amount of half-tone, anywhere or "anywhen," a result which he contended was unattainable by Colonel Sir Henry James or Mr. Osborne, as the latter gentleman had that evening very frankly admitted. Mr. Pouncy further contended that his process would reproduce the necessary half-tone required in views from nature, while the results which had been shown that evening were only copies of prints. Mr. Pouncy made some further interjectional observations as to the various claims to originality advanced by different experimenters, making special allusion to a person calling himself his (Mr. Pouncy's) apprentice.

Mr. Hughes desired to ask the Chairman whether the purpose of the meeting was to hear and discuss a paper by Mr. Osborne, or whether they were to receive a separate communication from Mr. Pouncy? He put this question with the desire of ascertaining in what direction the discussion was to be continued.

Mr. Pouncy wished it to be understood that his remarks applied specially to what fell from Mr. Osborne in reference to half-tone.

Mr. Portbury, (the gentleman alluded to as Mr. Pouncy's apprentice) here rose, and asserted his claims as the original inventor of the carbon process.

The Chairman deprecated the personal character which the discussion was assuming.

Mr. Sebastian Davis—(recurring to the proper direction of the discussion, namely, the subject of half-tone), said that in the early part of his life he had had some experience in connexion with lithography, and the conclusion which that experience led him to was that it was impossible to obtain by lithography that delicate gradation of tint which existed in a photograph; and this, he thought, arose from the granular structure of the stone itself, and the fact of the ink being so intensely black. He had given expression to this opinion on a former occasion, and he saw no reason for altering his views on the subject.

Mr. Malone had held similar opinions to Mr. Davis at one time on this subject. He was now, however, disposed to entertain them interrogatively, in view of the fact that the impression was communicated to the stone by the exposure of an organic substance and a suitable salt to light, the organic substance acquiring by this exposure the power of resisting moisture and receiving grease, in the shape of lithographer's ink. The process then under consideration differed from the ordinary silver process in this respect, that in the latter there were different depths of deposit, producing the variations of shade, while in the former the point aimed at was an equal distribution of dark matter over the entire surface. In the print shown by Mr. Pouncy there was not that delicate gradation of tints visible in a silver print, and there certainly was blackness in the shadows, which theory would indicate as likely to be produced. In reference to the last print handed him by Mr. Pouncy, he would observe that there was no negative shown with it, nor any silver print to aid in forming an opinion of its merits: he could not, therefore, praise it, and would not condemn it. Now, if he might be permitted to occupy their time further, he would say that he had examined some of M. Fargier's prints in the Exhibition, a first glance at which induced him to think that they possessed a degree of half-tone equal to a silver print: on comparing them, however, more closely, he was constrained to alter his opinion. M. Fargier's prints were certainly inferior in that respect. Seeing, however, that he had obtained so much half-tone, the idea suggested itself whether or not the extent to which the pictures fell short of silver prints in that respect was not attributable to the nature of the pigment. Carbon, it was known, was densely opaque and amorphous, and he would suggest that experiments in this direction might be advantageously made with finely-divided gold or silver, instead of carbon. He felt satisfied that the carbon process would accomplish a great deal, but it was extremely doubtful if it would ever equal the silver process.

Mr. Osborne was sorry the discussion had not taken a direction more immediately connected with his paper. He must say, however, that the strange request of Mr. Pouncy could hardly be regarded as reasonable, since he wished Colonel James and himself (Mr. Osborne) to tell him *all* the details of their processes, while he (Mr. Pouncy) communicated nothing. Moreover, Mr. Pouncy was in error in supposing that he (Mr. Osborne) could not obtain half-tone; he did get it every day, but not good half-tone; hence the adoption of his clearing process. For the rest, he could not see what Mr. Pouncy had to complain of on the score of originality of invention, since the first man undoubtedly who produced a carbon print was M. Poitevin; and, as to the somewhat free statement made by Mr. Pouncy that certain gentlemen claimed to be inventors, he must observe for himself, and he thought he might do so for Colonel James, that they made no claim to originating a process, but rather to the initiating and adopting very important modifications. He thought it hardly prudent to say that it was impossible to produce half-tints from stone, so many impossible things were being accomplished every day. He could endorse for the most part the remarks made by Mr. Malone: he thought, however, that the different degrees of intensity in the shadows were produced, not so much by the piling up of material, as by the proximity to or distance of the particles from one another. Mr. Malone had not

observed so strictly as might have been desired the distinction between his (Mr. Osborne's) process and the carbon process. He thought the art of photolithography would tend to utilise and generalise photography very much.

The thanks of the meeting were unanimously accorded to Mr. Osborne and those gentlemen who had contributed photographs for exhibition that evening. The meeting was then adjourned.

The next meeting will take place on the 2nd of December.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The adjourned meeting of this Society was held on Wednesday evening, the 5th instant, at the rooms of the Literary and Philosophical Society, George-street,—Professor W. C. Williamson, F.R.S., in the chair.

A note was read from Mr. Mabley, containing his resignation of the Secretaryship. Mr. Parry was requested to officiate until the election of his successor, that election being adjourned until after the passing of the revised rules.

Messrs. Evan Griffiths Hughes and Alfred Veritz were elected members of the Society.

The revised rules were read over, and it was agreed that they should be discussed at a special meeting of the Society called for that purpose.

The Treasurer's report having been passed, the Secretary read the

ANNUAL REPORT, 1861-62.

The Council of the Manchester Photographic Society, on presenting their Report for the Session 1861-62, congratulate the members on the continued prosperity of the Society, the number of members being on the increase, and, what being of still more importance, the new members are all good practical photographers, and anxious to join on account of the assistance they can either give to others or receive from them in their favourite pursuit. The funds of the Society are in a satisfactory condition, there being a slight increase in the balance in hand, notwithstanding the reduction in the subscription.

During the session numerous topics of interest have been discussed at the meetings of the Society, and papers have been read on the following subjects, the same having subsequently appeared in the Journal :—

Some Remarks on a Tour to the Continent, and Visits to Photographic Studios. By Mr. Petschler.

On the Preparation of Albumenised Plates, illustrating his Mode of Preparation. By Mr. M. Noton.

On Microphotography. By Mr. J. Parry.

On the Expenditure of Silver Used in Photographic Operations. By Mr. W. T. Mabley.

On a Fine Adjusting Screw for Cameras. By Mr. M. Noton.

On the Lighting and Management of Light in Photographic Galleries. By Mr. Lachlan M'Lachlan.

On Panoramic Photography, with Description of Camera for that Purpose. By Mr. J. Parry.

It would be invidious to make comparison amongst these interesting communications, nevertheless your Committee cannot refrain from referring to the experiments on panoramic photography with a stereoscopic camera and lens as being especially interesting, and it is hoped this gentleman will not leave the subject till he has made the system quite perfect, it having the advantage of not requiring any new piece of apparatus to those who already possess a stereoscopic camera of either one or two lenses.

The experiment of the summer session has not been on the whole satisfactory: the attendance of the members has been small, and it is thought inexpedient to continue it another year, as, if any subject of importance required it, a special meeting could be called at any time.

Your Committee cannot conclude without congratulating the members on the fact that those of your body who contributed to the International Exhibition all gained either Medals or Honourable Mention.

Mr. Wardley then called attention to the Exchange Club of the Society, there being many beautiful specimens of photography in the Exchange Club portfolio waiting offers of others in exchange for them.

A conversation arose on the subject of darkening or charring very transparent sections of wood, &c., &c., used in photomicrography.

Mr. Heywood suggested the use of nitrate of silver, and also the juice of the onion. Other suggestions were made, such as sulphuric acid, charring between plates of glass, &c., &c.

The Chairman introduced a beautiful album for *cartes de visite*, procured for the Society by Mr. Sidebotham, and requested the members to fill it as early as convenient with their own portraits.

Professor Williamson called attention to the imperfections of some of the earthenware baths now sold. It would appear that they are not now so well glazed as formerly. Several of the members stated that baths they have had in use for years were then as good as ever; others, that in baths purchased recently the solutions had percolated through the earthenware, which soon became useless, in addition to the loss of the solutions.

The meeting terminated with the usual vote of thanks to the Chairman.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association was held in the Religious Institution Rooms, on Thursday evening, the 6th instant,—Andrew Mactear, Esq., Vice-President, in the chair. The attendance of members and friends was unusually large.

The minutes of last meeting having been read by the Secretary, Mr. Edmund Brace, and adopted,

The Chairman called upon Mr. Stuart to read his paper.

Mr. Stuart, before commencing, said that Mr. Macnab had offered him for the evening the use of his camera, which was a *facsimile* of his own with the exception of the frame for holding the condenser, which was a decided improvement upon the plan adopted in his camera. Mr. Stuart then proceeded to read his paper :—

On Pictures by Woodward's Solar Camera, and How to Take Them.

I assure you that it gives me great pleasure to acquiesce in the request made on the last night of meeting. The solar camera pictures are now before you, and if you give me your indulgence for a short time I will endeavour to fulfil the other part of the request. The four pictures now before you are not shown as all that can be done or desired, but merely as one day's work with that instrument.

Having, in the course of this season, made a tour to London and the provinces for the special purpose of seeing what progress had been made in the production of enlarged pictures, the conclusion I came to was that pictures by development were, seemingly, the only satisfactory kind that could be produced (in this country at least); and I must say that to my mind they were not quite agreeable, but if touched up with chalk or some other medium they are passable.

For a considerable time previous to this I had a solar camera, which was obtained from Mr. Atkinson, of Liverpool, and, as Mr. Mactear stated to you in his paper, had it placed in working trim, but with a focussing-board with as many joints as a "Blondin." In this state it lay for a considerable time, and from what I had seen on my tour I almost despaired of ever being able to produce prints by the direct action of light. Nevertheless, as it was, I thought that a trial on my part was the best way to proceed in the matter, and that by a little perseverance I might overcome some of the difficulties that lay in the way. The window at which I had the solar camera then placed had a south-west exposure—the best for the purpose I could obtain. In this situation I could only get the sun for five or six hours a day, and that on the longest days in summer. However, the experiments I made convinced me that direct prints could be produced with ease and certainty, but that I should be tied up to a few hours' use of the sun per day did not at all meet my ideas on the subject.. Think how provoking it was to have him (the Sun) blazing away all morning and not able to make use of him; and about the time he should be round a cloud to cover him from your view the rest of the day, thus ending a whole morning's work of preparation.

Allowing you to be so fortunate as to have the sun, the most that could be done would be two prints, although by this method I never succeeded in getting more than one. I saw plainly that a window was not the place. Something else must be done: the camera must be placed so as to get the sun at all hours of the day (if he shone at all); and how this was to be done best and cheapest caused me no small amount of thought. For the mirror thus to catch the sun the camera must be placed on end like a "bear looking for buns." At last I succeeded in patching up a house for it in one corner of the garden, so that there was nothing to intercept the sun's rays from morning till night.

The accompanying photograph, from a window of my dwelling-house, will give the outward appearance; and a drawing of the inside, showing camera and arrangements for the focussing-screen, will give you an idea of the apparatus by which the four photographs now on the walls were taken.

I will give you as briefly as possible the *modus operandi;* and if any gentleman, when I have finished, does not quite understand it, I shall be most happy to answer any question on the subject. For the benefit of those who have not seen the solar camera I have brought it here with me to-night, so that any explanation regarding its construction will be unnecessary on my part. It is my opinion that thirty or forty shillings more might be well laid out upon it to render it more efficient.

To produce the negative, make up a new silver bath of pure nitrate of silver, thirty grains to the ounce. See that you have collodion giving you clear pictures without crapy lines, as defects in the collodion will show in the large pictures: spots not visible before will show like buttons, which might do very well in the right place, but not on the face. Everything in the dark room must be in the best order. Look to the camera and dark slide, and see that they are clean, as, if everything does not work well, you will be sure to raise dust. In short, do everything in your power to avoid raising dust; for, if you do, your faults will be magnified a hundred-fold.

The glass must be of the best colourless patent plate, and as thin as possible. Do not give the plates to a boy to clean, but do it yourself. As they are much softer than other glass they should not be cleaned in the dark-room; only wipe them with a wash-leather, coat, and sensitise in the usual manner. Do not blow on the plate before coating, and after coating do not hold the face up till it sets: blowing gives little transparent spots, and holding the collodion side up attracts dust, which transforms itself into comets.

The lens should be what is termed a full-plate (nine or ten inches focus), with as small a stop as possible, without making the sitting too long. The lens used by me for this purpose was a Ross's half-plate. The model should be placed in a good light so that he may stand out round and bold.

Having thus arranged your model, place your camera at such a distance as will take in all that you want, on a space of say 3¼ by 2¼ inches: have it sharp all over, and give it such an exposure as will bring out all the detail. Over-exposure tends to reduce the high-lights of nose and brow, which in a life-size should never be wanting. I cannot help thinking a common error with photographers is supposing *that over-exposure gives density*. The proper timing of the negative is a very nice matter.

The developing may now be done with sulphate of iron 15 grains, spirits of wine 15 drops, glacial acetic acid 15 drops. Pour over the plate in the usual manner till all the details are up, wash, fix, and wash, and the negative is complete. Dry at once, to prevent dust adhering to the plate. The negative must not be varnished.

Now dust out your solar camera, polish up the mirror, rub up the condenser and the enlarging lens, which should be the best 4½-inch focal lens you can get: the one I use is a Voigtlander's. You are now ready to place the negative in the groove prepared for it in the camera. Before preparing the paper, we will arrange the focussing-screen, which must be placed in such a position as will give the image the size wanted. Having moved it up and down, and decided on the place, we will say that we have obtained the rough focus (till we get the paper ready there is no need of doing more). The mode of preparing the paper and the paper itself are just the same as used for all my prints.

Sensitising Bath.

Nitrate of silver	100 grains.
Pump water	1 ounce.

Make the bath slightly alkaline with ammonia: keep it always so, as it makes the paper more sensitive, giving at the same time a richer tone to the prints. Some are quite astonished when I tell them that my bath always keeps as clear as spring water, and that too with every kind of paper.

Having floated the paper—say, if Saxe, three, and if Rive, five minutes—on the above silver bath, pin it up to dry above a hot-water pan, covered of course, allowing it afterwards to cool: it will then be ready for pinning down on the stretching-board—drawing-pins will do for this purpose. Having stretched it (the paper), cover it over with a sheet of blotting-paper, and then with a board. I presume here that your solar camera and sensitising house are two distinct places.

If the sun be now shining take it to the solar camera, place the board on the focussing-screen, in such a position that the enlarged image will fall in its right place. This being done, you will require to get the mirror in such a position as will bring its focus right on the centre of the enlarging lens. Having done so, you will see on the focussing-screen a coloured disc formed by the condenser: stick, without loss of time, some drawing-pins here and there all round the yellow ring, and in this way you will have a guide for the shifting of the mirror.

You must now have a piece of orange-coloured glass the size of the negative, which place over the negative in the camera. Having done so, lift off the board and blotting-paper, leaving the sensitised sheet exposed to the image.

Now, with the rack-work of the camera, focus the image very nicely on the paper. When you have obtained the best focus, fix up the negative and frame which holds it so that it will not move in the least, as the wind on the mirror is very apt to make it do, and which it might do just when the picture is all but finished. Make up your mind, if you wish a good picture, to be now a prisoner for two or three hours.

Take the yellow glass off the negative, watch the yellow disc, to keep it right on the drawing-pins, and, if all goes well, in two hours and a-half you will have a beautiful enlarged print, far exceeding those now on the wall before you. I may mention that the depth of printing is just about the same as if it were a print from a negative by contact. The print is now washed and toned in the usual manner with acetate of soda.

Toning Bath.

Acetate of soda	7 ounces.
Water (distilled)	80 ,,
Chloride of gold	15 grains.

One hour before using add 80 ounces more water and 7½ grains more chloride of gold.

Fixing Bath.

Hyposulphite of soda	6 ounces.
Water	20 ,,

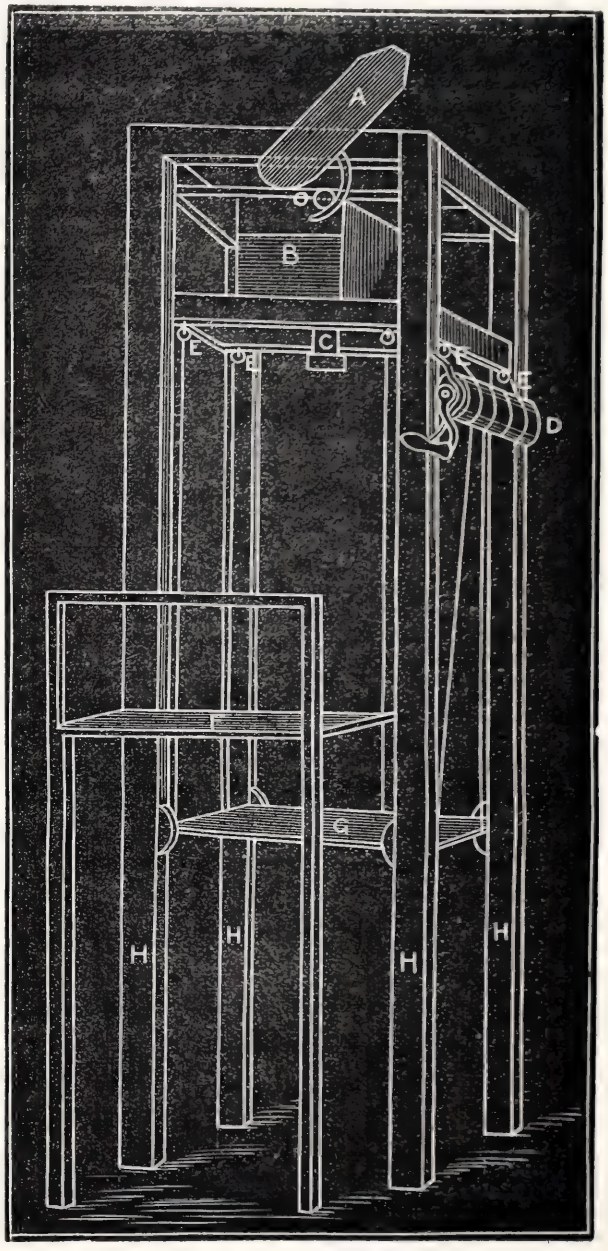
With regard to the apparatus I feel dissatisfied with it, and I think that something cheaper and better may yet be obtained; in fact, for such an end I have been labouring for some time past, and, with your leave, at no far distant day will introduce to your notice "Stuart's solar camera," which is already a fact—not an idea.

The Chairman said with reference to the very interesting paper just read by their friend Mr. Stuart, a gentleman from London, Mr. Sanford, son of the well-known albumenised paper maker, having to-day been shown Mr. Stuart's productions, he expressed himself highly pleased with them, and declared that if they were in London they would make the fortune of the successful artist.

Mr. Sanford, who was present, rose, and confirmed the remarks of the Chairman, adding that the four pictures then exhibited by Mr. Stuart were perfect.

Mr. Stuart exhibited a drawing of the interior as well as a photograph of the exterior of the house in which the camera had been placed, and also some negatives from which he had printed enlarged pictures. He said that the pictures were hurriedly taken, so that necessarily there were some little flaws upon them. They were not even varnished.

[A number of the members then gathered round the camera, when Mr. Stuart explained how the apparatus worked, and answered the various questions which were put to him.]



A Mirror.
B Camera.
C Enlarging lens.
D Winch for raising and lowering focussing-screen.
E Pulleys.
F Operating platform.
G Focussing-screw for large image.
H Posts forming framework.

Mr. Brace said that he had had the opportunity of inspecting the apparatus which Mr. Stuart had put up, with considerable ingenuity, to make use of his solar camera, and had arranged an apparatus which seemed to produce an image quite free from waviness. He was glad that Mr. Stuart had kindly promised to give them another paper at a future meeting, and had great pleasure in proposing that they should award their thanks to Mr. Stuart for his very interesting paper.

Mr. Wilson said he had listened with great pleasure to the very lucid paper which Mr. Stuart had read. He had seen some magnificent things, but nothing like what had been shown by Mr. Stuart, they were certainly very fine, and he was proud of the success which Mr. Stuart had obtained.

Mr. Brace suggested the use of clockwork to direct the mirror.

The Chairman then formally put to the meeting the motion for a vote of thanks to Mr. Stuart, when it was carried with acclamation.

Mr. Stuart returned thanks for the compliment which had been awarded him, and cautioned his auditors about the expense of a clock-movement.

Mr. Sanford showed some pictures; and Mr. Wilson exhibited at the same time a number of *cartes de visite*, taken by M. Ken, in Paris. Mr. Sanford also exhibited some very beautiful prints of copies of engravings, which were handed round to the members, and much admired.

The CHAIRMAN remarked that there was no doubt whatever that enlarged pictures would soon become the order of the day.

Mr. EWING said that while they had the pleasure of examining the result of one day's work, they must allow one advantage to pictures taken by development. He was very sorry that Mr. Stuart had expressed so much dissatisfaction with the working of Woodward's camera. He had forgotten to give to it the praise which was due, and he (Mr. E.) thought that Mr. Woodward had a right to honour. He joined with the other members in expressing his satisfaction with the work which Mr. Stuart had done, and with his having brought lenses and other apparatus to bear in a manner which had been done by no other artist. Referring to the camera, Mr. Ewing said it would be impossible, because of the rumbling of carts, &c., to get in Glasgow the requisite steadiness. They must adjudge Mr. Stuart much credit for improving the apparatus. His was the first step, and he had no doubt others would follow.

Mr. STUART said he had been guilty of a misdemeanour. He no doubt should have given credit to whom credit was due. However, so far as his judgment led him, he did not think that he aggrandised himself in the matter. The pictures upon the wall were taken by Woodward's solar camera as sent to him from Liverpool, with the exception of a few wedges knocked in here and there to keep it from shaking. The object Mr. Ewing had in view he also had in view. He had endeavoured to get rid of the annoyance caused by the moving of carts. The shaking from carts would not injure the new camera. Mr. Ewing was rather beforehand with his remarks regarding it, because he (Mr S.) had said very little about what it might be.

Mr. BRACE reminded the meeting that the paper was upon Woodward's camera, and thought that Mr. Stuart had said very little of his own improvements.

Several modifications of photographic apparatus were then exhibited, including a simple instantaneous shutter and new dark cell; after which

The CHAIRMAN said it afforded him much pleasure to see a gentleman present who had done more for photography, he supposed, than any other gentleman in Glasgow—he meant Professor Taylor. Some years ago he happened to be in his house by invitation, and saw his dioramic apparatus, and he should not easily forget the wonderful results he then saw. It would be a great kindness if Dr. Taylor would promise them upon some occasion—not far distant, perhaps—to bring that apparatus and show it there.

Dr. TAYLOR said he could scarcely refuse such a request. He had an excellent example of liberality in Mr. Stuart, who had explained all his processes and results. He admired the liberality of photographers, and would be glad to aid the Society as far as he could. There were, however, difficulties in the way. The apparatus referred to was such that perhaps only eight could see it at once; and supposing that his friend Mr. Macnab, who had fitted up that apparatus, were to bring his, and the two were put in action, only twelve would be able to see them at once. In order to judge of his dioramic apparatus properly they would require to see the changes and watch it for a considerable time, because they might have a wrong idea of it. But if the members wished to have explanations, instead of seeing it, he thought he could scarcely refuse to comply with the wish. With regard to the beautiful pictures which he saw upon the wall, he could scarcely leave the room without mentioning the great gratification he had had in looking at them. For the first time, those pictures gave him an idea of what might be done in gallery pictures. It would be a great advantage to have fidelity of photography in gallery pictures. All the pictures hitherto which had been taken and enlarged afterwards were so blurred, and altogether so bad, that they gave no hope of anything like the perfection of smaller photographs; but here was a new step; they had obtained beautiful enlarged pictures. If they could get colour added to that by the artist, another important step would be made. The pictures exhibited were the only ones that had impressed the idea upon his mind that photography would be a great art. He would wish to ask Mr. Stuart whether he had ever been annoyed by the heat? and whether the effect of the sunbeams, when condensed by that great lens, injured his negative? He should fancy that would occur. Mr. Stuart had said that he did not varnish his negative: was that merely to preserve the perfection of the picture? or was it done from the fear that the sun might melt his varnish? With regard to double reflection, that could not be got rid of except by using the telescopic speculum. He would also like Mr. Stuart to say whether he had any difficulty in exercising the double movement, and whether he could execute these two movements without shaking the apparatus.

Mr. STUART said he was sure that if he had displayed any liberality in the matter he was indebted to Dr. Taylor, who was his father in photography, and to Mr. Spencer, who was his nurse in that beautiful art. He had, indeed, been brought up in a liberal school. He would never forget a saying of Dr. Taylor, that "the man who knows least keeps most to himself." He did not varnish his negative because if any varnish were used small crystals of varnish would be formed upon the surface of the negative, which would reflect prismatic colours. As he had operated, the heat had little effect upon the negative: it scarcely warmed it, and they could handle it easily. The heat of the negative, after the rays had passed through, was about blood heat. There was a strong heat in the place, certainly, raised by the condenser, and if the hand were placed before it it was hot. He (Mr. Stuart) then took up the drawing, and showed that there was no possibility of shaking the mirror, unless they let fall the door. Otherwise the camera was fixed, so that there was no motion upon the mirror. But, of course, in the new camera he had tried to obviate the shifting of the mirror altogether.

Mr. JACK: Is it indispensably necessary that the mirror should be fixed to the camera?

Mr. STUART: No. The shaking of the mirror does no harm at all.

Mr. WILSON: The shaking of the mirror is merely a mechanical difficulty that can be easily got rid of. It is easy to get a steel plate that can be ground perfectly flat so as to obviate the wavy reflection before alluded to.

On the motion of Mr. MACNAB, seconded by Mr. Mactear, Professor Taylor was then nominated an honorary member of the Society.

Five new members were then unanimously elected by ballot, and the meeting separated.

[It is right to mention that the beautiful pictures exhibited by Mr. Stuart were not only perfect but untouched as they left the fixing bath.]

EDINBURGH PHOTOGRAPHIC SOCIETY.

AT the meeting of this Society on the 15th ult. the chair was occupied by the President.

After the minutes of the previous meeting had been read and confirmed, the following members were admitted:—Messrs. G. Waterston, Jun., J. M'Culloch, and Frederick W. Carter.

A letter from Mr. Auchie was read resigning his office as Secretary.

A conversation then took place on the subject of copyright, introduced by Mr. Mure at the last meeting of the Society.

Mr. MARWICK stated that as THE BRITISH JOURNAL OF PHOTOGRAPHY containing Mr. Mure's paper had only that morning been published, and many of the members might not have had an opportunity of studying it, he thought it might be desirable to postpone a discussion on the subject till a future occasion, and in the meantime submit the paper to a Committee embracing the members of the Society connected with the legal profession; and that members should send to the Secretary any questions they might consider of importance connected with it. This proposal met with unanimous approval, and the following gentlemen were appointed members of the Committee, viz., Sheriff Hallard, Mr. Mure, Advocate; Mr. Marwick, S.S.C.; Mr. Traquarr, W.S.; Mr. Carter, C.A.; Mr. Anderson, Solicitor at Law; Mr. Galloway; Mr. Hill, publisher; Mr. Nicol, chemist; and Messrs. M'Glashon and Horsburgh, photographers.

A conversation followed, and was kept up with spirit for the rest of the evening, in which the President, Messrs. Mure, Hill, Anderson, and others took part. The principal subject was the existence of copyright as distinct from the right of property in a painting. As the report of the Committee is expected to be published at an early date, our reporter has deemed it inexpedient to give the proceedings on this occasion, especially as a considerable difference of opinion prevailed among the members on the subject. Those of our readers interested in the matter are requested to communicate with the Committee, through Messrs. Mure, Advocate, Dublin-street, or J. T. Taylor, 81, South Bridge, Edinburgh.

AMATEUR PHOTOGRAPHIC ASSOCIATION.

A COUNCIL Meeting of this Association was held on Friday, the 7th instant, at 26, Haymarket. James Glaisher, Esq., in the chair.

The minutes of the last meeting having been read and confirmed, the SECRETARY read a letter from Matthew Marshall, Esq., chief cashier of the Bank of England expressing his regret that he was prevented by indisposition from attending the meeting. The following members and subscribers were proposed and elected.

Lady M. J. Matheson.	Lady K. Hutchinson.
Lady Pine.	The Hon. L. Wingfield.
J. D. Harding, Esq.	Lieut.-Col. J. M'Gregor.
A. W. Erskine, Esq.	Professor Emerson.
J. S. R. Moss, Esq.	W. W. Charley, Esq.
Rev. John Williams.	Mrs. J. Bullar.
D. Laurie, Esq.	Rev. H. Read, M.A.
Mons. G. Delisle.	S. Barton, Esq.
Capt. C. J. Cox.	J. Toynbee, Esq.
W. Carte, Esq.	Capt. Davies.
G. R. Playfair, Esq., M.D.	R. H. Smith, Esq.
J. L. Smith, Esq.	J. Campbell, Esq.
J. F. R. Atherstone, Esq.	F. Orpen, Esq.
P. Barker, Esq.	Mrs. Ponsonby.
Miss M'Gillivray.	Major P. Innes.
S. C. Allsop, Esq.	G. H. Frothingham.
W. R. Anstice, Esq.	Henry Coxwell, Esq.

The SECRETARY then read a letter from Lieut.-Colonel C. Holder, a member of the Association, relative to the holding of an Exhibition of Photographs by the Association. The subject was adjourned for further consideration at the next meeting.

The CHAIRMAN having asked the Secretary when he proposed returning the Association negatives now in hand, and calling in the ones for next year,

The SECRETARY replied that he proposed applying for the new ones about the beginning of January, and that although members could always have their negatives returned to them on demand, yet, that owing to the continued and rapid increase of members and subscribers, it would be greatly to the interests of the Association that the negatives for one year should not be returned until those for the year following were ready for publication. The Secretary also mentioned that the number of negatives now in hand were about three thousand.

The proceedings of the meeting then terminated.

A. J. MELHUISH, HON. SEC.

Foreign Correspondence.

Paris, November 11th, 1862.

I SEND you the substance of a communication made to the Photographic Society of Marseilles, at its meeting of the 8th instant, by M. Poitevin. It relates to the modifications introduced by that gentleman into photographs on gelatine.

After having studied gelatine for more than twelve years, M. Poitevin is convinced that it is one of the most advantageous vehicles for the production of negatives. While recently trying to discover a new mode of preparing iodide of silver, he succeeded in consolidating the gelatine so as to obtain thin films which do not shrivel up in the baths, and whose surface is equally impressionable, whether damp or dry. He thus obtains very vigorous negatives whose lights are free from all cloudiness,

M. Poitevin operates as follows:—In one hundred grammes of rain or distilled water, must be melted, with a gentle heat, six grammes of gelatine. After filtering through fine linen he adds about fifty drops of a concentrated solution of bichromate of ammonia or potash. With this mixture he coats the surface of a well-cleaned glass, so as to form a thin and uniform layer. As fast as the glasses are thus prepared, they are placed on a horizontal rest, where they remain till the gelatine takes the jelly form, which is in about ten minutes; after that they are left in the light for about the same time. The bichromate reacts on the gelatine, and prevents it from wrinkling in the water during the ensuing operations. After this exposure, and before the gelatine is dry, the glasses are applied, on their coated side, to a neutral eight-per-cent. silver bath. Chromate of silver is immediately formed in the thickness of the layer. You wash in abundance of water to take away the excess of nitrate of silver, and then plunge the film into a six-per-cent. bath of iodide of potassium, previously saturated with iodide of silver. The glass is not withdrawn from this bath till the red tint of the chromate of silver has completely disappeared; then it is well washed, and left to dry spontaneously, unprotected from the light. All these operations may be performed in broad daylight, as the iodide of silver, that is produced in presence of the excess of iodide of potassium, is not reduced by the light. In this manner a large number of glasses may be prepared beforehand. When they are to be used the iodide of silver coating is sensitised by plunging the glass into water for a few minutes (so that the gelatine may be thoroughly soaked), and then repeatedly pouring upon its surface a two or three-per-cent. solution of nitrate of silver. The plate is now plunged into distilled water to remove the excess of silver, and may be exposed immediately in the camera. However, the exposure may be delayed for an hour after the preparation, as the gelatine retains its humidity for some time. The pose must not be longer than for collodion. If you operate dry you wash the sensitised surface several times, and leave it to dry in the dark, the development is absolutely the same—that is to say, after exposure the glass is plunged into distilled water that the gelatine may regain the humidity it may have lost; it is then passed into a gallic acid bath to which has been added a few drops of a solution of nitrate of silver, but without acetic acid. You may also develop with sulphate of iron acidulated with tartaric acid, and then intensify with gallic or pyrogallic acid. Sulphate of iron reduces silver to the white state. If the image comes sufficiently by means of this reduction, it is toned to black by a very weak solution of chloride of gold. These negatives are fixed with cyanide or with hyposulphite, weak cyanide being preferable, as it acts more rapidly, and can more easily be removed from the gelatine. The negative, after being dried, may serve without varnishing for printing on paper; but, for greater security, a varnish may be given to it as to *clichés* on collodion.

On the 4th of November was opened the first permanent Exhibition of the *Comptoir International des Photographes*, the establishment of which received such a kindly welcome in England, where the useful services that the *Comptoir* is destined to render were immediately understood. The position has been well chosen, the premises being situated in one of those localities where the pedestrians pass in largest numbers—not vulgar pedestrians going to their labour or returning to their homes, but that privileged class whose leisure allows them to stop and admire, and whose gold permits them to purchase the objects that are pleasant to their sight—artists, who know how to appreciate beautiful things—men of letters, who speak and write of them—in a word, the whole of that class of our Parisian society, which is without a counterpart in England, and which we designate under the collective name of *flâneurs*. The specimens are laid out with taste in windows which are brilliantly lighted up in the evening. The subjects, varied with intelligence, attract the eye. Every day they are changed, that the interest of the public may be kept up, and that each artist, in turn, may have some of his works exhibited. The collection, which is already numerous, counts some admirable novelties by German photographers, especially by Albert (of Munich). English artists figure in the foremost rank. The splendid views of Mr. Mudd are already producing their effect on those amateurs who had as yet seen nothing by that artist. Messrs. Wilson, Robinson, and Breese are represented by marvellous pictures. Others will soon come and take the place reserved for them. Our own photographers and our amateurs will not be wanting. Poitevin's carbon pictures, Nègre's beautiful engravings, the amplifications of M. Edouard Delessert, the reproductions of Micheletz, and all the collection of contemporary figures will be offered to the curiosity of visitors and purchasers. Apparatus also have their place in this little museum, where we may follow the progress of the art, and study the different talents of the principal photographers of all countries. I repeat what I have said already, and what the eagerness of the crowd of visitors proves superabundantly, the idea is an excellent one, and its intelligent execution will not fail to be useful to all. ERNEST LACAN.

Philadelphia, October 20, 1862.

As the report of the meeting of the North London Photographic Association on the 17th September shows that Harrison's new lenses were mentioned during the course of the evening, and the remarks on the subject prove that they are not fully understood in England, I would venture to describe them a little more fully than I have done in previous letters. During the past two weeks I have had an opportunity of testing them myself, and of having many negatives made with them under my supervision.

In the machine works of Wm. Sellers and Co., Philadelphia, to which your correspondent is attached as engineer and general superintendent, it has been the custom to make photographs of all the machinery there built, and to preserve these pictures for future reference, as well as to use them as illustrations in answer to correspondents. The instrument used for this purpose was a single view lens, of eighteen and a-half inches focus, which would cover a 14-by-18 plate—not, however, without considerable distortion of the marginal lines. The orthoscopic lens was tried, but was objectionable, on account of its long focus and slow working. The new lenses of Harrison's seemed to be more likely to answer the purpose, and one was accordingly ordered, having a focal length *(measuring from the surface of the back lens to the ground-glass)* of twelve inches, and which gives a circular field of light of twenty-four inches in diameter. This will of course cut a square of sixteen inches, or cover a 14-by-18 plate. The exterior surface of the front and back lenses are portions of a perfect sphere, and are three inches diameter, measuring across the diameter of the tube, and from the face of the front lens to the face of the back lens is four and a quarter inches, *i.e.*, they are a sphere of four and a quarter inches diameter. The stops are placed in the centre of the sphere, and are arranged in a circular plate so as to be readily rotated into position. The first use to which this lens was put was in making a copy of a very fine line drawing of a machine. This drawing was twenty-four inches wide and thirty-four inches long, and was reduced in photography to twelve inches wide and to a proportional length. The largest stop, which is 7·12 inches opening, seemed to show a field in perfect focus over its whole surface; but the smallest stop in practice was made use of—this is 9·32 inches diameter. With this opening, and the drawing placed in full sunlight, an exposure of ten seconds was too long, and even with five seconds the extreme corner lines showed the effect of

over exposure; but in-doors, under a glass roof having a northern exposure, from three to ten minutes proved the most satisfactory. With this particular lens the most careful experiments showed no necessity of correction for chemical focus being required, and the marginal lines *are perfectly straight*. It was afterwards used in photographing some large machinery, and with the best results, the negatives produced being without exception the very best of the kind I have ever seen.

The smaller-sized instrument, such as is used for stereoscopic purposes, gives a circle of light five inches diameter, and will cut a square three and a-half inches by three and a-half, and has a focus, measuring from the back lens to the ground-glass, of two and a-half inches. Compared with a pair of Jamin tubes, the Harrison tubes to make equal-sized pictures must be advanced twelve feet nearer to the machine being copied than the Jamin, *i.e.*, in this instance, to within six feet of the machine. This shows how large a visual angle is included. The high price of these new instruments—the large instrument above alluded to costing one hundred and twenty-five dollars, and the small size fifty dollars per pair—seems no drawback to their introduction. Until I tried the instrument myself I must confess I doubted the wonderful advantages claimed for them, but now my long focus lenses are laid on the shelf. Mr. Borda was long ago enthusiastic about these lenses, and was one of the first to supply himself with them; while Messrs. Rutherford and Mr. Hull were loud in their praise.

A curious photographic accident occurred a few days ago which may be worth mentioning. In copying drawings in this country it has been the custom to use a collodion sensitised with an iodide only, and to under-expose the picture, so as to insure the absolute transparency of the lines. The negatives are developed with iron, fixed with cyanide, and then strengthened with bichloride of mercury and iodide of potassium, or sometimes with bromide of potassium or ammonium. It has generally been found necessary to flow plates thus treated with a solution of gum-arabic, to prevent peeling in drying; but the tendency to crack off generally occurs in the transparent parts of the film, and not in the intense parts. In the present case the negative—a very fine one of a line drawing—had been gummed as usual, and stood aside to dry; and, in drying, a very large portion of the *opaque* part of the film flew off, always separating at the transparent lines—the collodion film forming these fine lines in all cases remaining firmly attached to the glass. To avoid the tendency of these strongly-intensified films to thus detach themselves, Mr. Walker, who copies the drawings for some of the departments in Washington, has for years been in the habit of using a preliminary coating of albumen—one ounce of albumen to four or five of water. He says that plate-glass which has been used several times becomes so oxidised on its surface as to make this preliminary coating in all cases necessary.

The dealers in ambrotype cases aver that card-pictures are going out of fashion. I hope not. Certainly the demand for ambrotype cases is increasing very rapidly; but this is mainly owing to the great demand for cheap pictures to be quickly taken, and does not interfere with the regular business of making card-pictures. Operators would be glad to have them superseded by larger pictures. Mr. C. A. Palmer, who has written to the American journals, now writes as follows from Orange County, New York State:—"We are rushing at the *carte de visite* nuisance as fast as possible: can't you invent something that will supersede the *carte de visite?*"

The battle-field of Antietem, Maryland, has been visited by more than one photographer, and many good pictures are said to have been made, some of them showing war in all its horrors. It is a great pity some enterprising operator was not on the field of battle during the engagement; for, as was afterwards shown, there were many good and safe points from which the whole battle-field could have been seen, and it is a rare thing for a battle to take place on ground so disposed as to be all in sight at once, as this was for seven miles.

Captain Rodman, of the Ordnance Department, and Commandant of the Watertown Arsenal, says he keeps his camera and chemicals in order, although he does but little with them, his use of photography being confined exclusively to rendering the nature of fractures in cannon which have been burst, and the fractures of specimen pieces in the testing machine.

Professor Himes's method of using the alkaline gold-toning bath is being tried by some; but no report has yet reached me of the result. In my own case I have a test solution which I have used for toning once every week, making it acid with hydrochloric acid after each time it is used, and neutralising it with carbonate of soda before adding more gold, when about to tone with it. It seems, after thus working it for two months, to be quite as good as it was at first—*i.e.*, it tones well as far as colour is concerned; but it turns the prints very red when they are first put in, owing, no doubt, to the great accumulation of chloride of sodium from the constant addition of acid and soda alternately.

Thompson's changing box, which has taken the fancy of so many of our amateurs, and the history of which was so enveloped in mystery, has at last found its parent. and we are told that Mr. Rayne, one of Mr. C. Jabez Hughes's workmen, was the inventor of it, and that Mr. Werge was the veritable "Englishman" who sold one to Mr. Thompson. This is a very satisfactory piece of information, for it is sadly provoking to have no name to a good thing.

We find that Professor Emerson has conveyed the impression that double backs for dry plates are unknown in America. The fact of the case is this: double backs, or double dry plate-holders, have been in use in America since the very beginning of photographic operations. Four years ago I advised Mr. O. H. Wellard to buy a set, and he now wants to sell them at a discount, from not using dry plates. At the time he bought his they were considered a very old device—certainly one requiring no extra mechanical skill to design. Mr. Langenhiem (not Mr. Sangenhiem, as the printer read my manuscript in the last letter) has always used the double back. So does Borda, Fasset, and many other of the amateurs. Mr. J. R. Peate, of Washington, has his arranged to pack in the same box with his camera; while Mr. Fasset carries his plate-holders in one sole-leather case on one side of him, and his camera in a similar case on the other; and he avers that in some mountain passes he carries his tripod in his teeth! Professor Emerson's want of information on this subject arises from the fact that his actual personal intercourse with photographers has been limited, owing to his close confinement by professional engagements.

The double backs, as made in America, have sheet zinc slides or shutters, and these zinc plates are convenient slates on which to record in lead pencil the particulars of the exposure. The cost of six of these double backs—*i.e.* for twelve plates, with its extra focussing-glass—is nine dollars; while my changing-box, on Mr. Hughes's plan, cost five dollars and fifty cents.

Before closing this letter I would venture to suggest that, should any of the readers of THE BRITISH JOURNAL OF PHOTOGRAPHY desire information concerning the art in America on points not alluded to in these letters, if they would only address their questions to me through the pages of the Journal, or by letter direct, I would gladly furnish them with all the information I can. Questions from abroad would suggest the kind of knowledge most needed.—With due regards, COLEMAN SELLERS.

NEW IDEA.—An advertiser in *Humphrey's Journal* (American) says:—"For *cartes de visite* the melainotype plate has been too long and favourably known to need any statement of its advantages over every other substance employed for the ordinary collodion positives. There is, however, a new and most important use to which it can be applied, and one which, from its simplicity and rapidity, will commend itself to every operator. For *cartes de visite*, to be inserted in an album, the melainotype plates are admirably adapted. It is only necessary to take, first, a somewhat larger positive proof in the style desired for the subsequent *carte:* this proof can be reproduced, of smaller size, about as rapidly as the collodion can be put on the plates. To say nothing about dispensing with silvering the paper, and the tedious processes of toning and washing the photographic prints, the rapidity of the process alone should commend it, as also the undoubted durability of the pictures. All that is necessary, before mounting, is to varnish them in the usual manner. They can be inserted in the album more readily than the cards, and far surpass them in delicacy of tone, general beauty, and minuteness of detail. Many of the photographs will, from defective manipulation, or from the nature of the process itself, fade or discolour in time. The melainotype is free from any such liability. We have specimens mounted in the manner of the cards in the album which, after five years' by no means careful usage, are as perfect as when first mounted. If the whole trouble and time and expense of preparation are taken into account, it is certain they will be found to be better and cheaper than the ordinary photographs. Many operators who can now take excellent positives cannot furnish the *cartes de visite*, not being familiar with the method of taking good negatives and making photographic prints. Such operators, however, can at once furnish melainotype *cartes*. We commend them to all operators."

Scraps and Fragments.

THE PRINCESS ALEXANDRA OF DENMARK.—M. Chemar, the celebrated Continental photographer, has received an order for 80,000 copies of this distinguished lady's photograph.

NEW PUBLICATIONS.—The ever-busy compiler, Mr. J. Timbs, has just announced a work—*The Industry, Science, and Art of the Age*—which is to chronicle the wonders of the International Exhibition of 1862, and which will be illustrated by photographs "from negatives specially retained for this work."

PHOTOGRAPHY AND WAR.—A New York photographer is making a good deal of money by exhibiting photographs of the slain as they lay on the battle-field of Antietam. These pictures have a terrible distinctness. By the aid of the magnifying-glass the very features of the slain may be distinguished.—*Public Opinion.*

SINGULAR ANNOUNCEMENT.—Passing through Cheapside we were much puzzled by an announcement placed in the case of a photographer stating that portraits for lockets and brooches were taken on "*talk*" (could it mean talc?) for half-a-crown each. We have known all sorts of things taken on talk, viz., religion, politics, honesty, affection, &c., &c., but never before heard that photographs could be so taken.

FRITH'S COMING PICTURES.—Models are being rapidly sought and photographed for Mr. Frith's three new pictures, *Morning, Noon,* and *Night.* Sundry ladies (?) well known to the nocturnal frequenters of the Haymarket, says rumour, have been chosen as models for that of *Night,* which is to represent the Haymarket. Few painters use photography so much, or copy it more literally, than Mr. Frith, who yet denounces the fine-art claims of photography in the full spirit of the pooh! pooh! pooh! critics.

DE LA RUE'S STEREOGRAPHS.—Sir John Herschel, commenting on the experiments of M. Gussew, briefly described in our last, says, in a recent number of the *Cornhill:*—"The portion of the moon then turned towards the earth may be considered as a continuous mountain mass, in the form of a meniscus lens, capping the sphere of the moon, and rising in its middle to a height of about fifty-nine English miles above the general level of its figure of equilibrium. M. Hanshew's researches had already led him to conclude an elongation of the lunar axis in the direction of the earth, but not to much more than half this extent." That photography should aid in thus clearly demonstrating so valuable a fact as this extraordinary one of the moon being so very more convex in that portion of its surface which is always presented to the earth than is consistent with the perfection of its spherical form, is a fact for photographers who love their art to congratulate themselves upon.

THE PHOTOGRAPHIC TRANSPARENCY OF BODIES.—Professor W. Allen Miller has laid before the Royal Society a valuable paper on this and an allied subject, the photographic effects of metallic spectra, obtained by means of the electric spark He finds that "colourless bodies which are equally transparent to the visible rays vary greatly in permeability to the chemical rays;" that "bodies which are photographically transparent in the solid form preserve their transparency in the gaseous and liquid states;" and that "colourless transparent solids which exert a considerable photographic absorption, preserve their absorptive action with greater or less intensity, both in the liquid and gaseous states." Glass vessels could not be employed in these experiments, "as they all, even in thin layers, shorten the spectrum by from three-fifths to four-fifths, or even more, of its length." Rock crystal, cut in thin slices and polished, was the only substance the Professor found he could use with advantage. After atmospheric air and certain gasses, rock crystal, ice, pure water, and fluor-spar are most perfectly diactinic; and rock salt is scarcely, if at all, inferior to them. Among the salts of inorganic acids, the nitrates are the most remarkable for their power of arresting the chemical rays, and they are stopped by trichloride and oxychloride of phosphorous, although perfectly transparent and limpid. Reflection from a metallic speculum caused a great loss of actinic power.—*Intellectual Observer.*

PHOTOGRAPHY AT THE INTERNATIONAL EXHIBITION.—If the position of photography, as an art, be one about which there is much discord extant, there seems to be tolerable harmony in the opinions which have been expressed concerning its position in the Exhibition. We extract the following from the *Daily Telegraph:*—"If one phenomenon more than another has struck us, in a pretty constant intimacy with the habits of miscellaneous visitors to the Exhibition, it is that each man goes straight to the class of objects among which his work-day life is passed. The saddler goes to saddlery, and is of opinion that there is nothing like leather for the display of good workmanship. The photographer goes to the photographs—*if he can find them;* but in truth this department of the Exhibition has been by far its weakest point; and, thanks to misunderstandings at the outset—to the assignment of a most inconvenient locality for the display of photographic works—and lastly, to damp walls and leaky skylights, the productions of our great photographers, the Mayalls and others of their magic art, are very insufficient proofs of what they are able to do. Each craftsman—holiday-maker though he may be—repairs to the spot where are to be found specimens of handiwork about which his experience has taught him more than he knows of anything beside. A waiter, we can almost imagine, would be curious to see how the cloth is laid in dining saloons; and a well-known clown, attached to one of the large theatres, was actually observed taking mental stock of the capabilities which the east dome affords for a good bustling scene in the Christmas pantomime. But all thinking men must rejoice in the assurance that the finer branches of science, which may be far beyond their practical reach, are full of sap and vitality."

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

REMEDY FOR LOOSENING OF THE FILM.

To the EDITOR.

SIR,—If your correspondent who complains of the loosening of the film of tannin plates when moistened will try the following plan, I think he will get rid of this annoyance; at anyrate it is the best I know of, and will succeed with most, if not all, collodions. Instead of moistening with water, pour over it a mixture of equal parts of alcohol (not methylated), sp. gr. ·816, and distilled water: this will flow as easily as collodion, and may be poured in the same way. It may be received in a measure and used to develop with after being mixed with the pyrogallic and acid silver solutions; or, to be more economical, the diluted alcohol may be poured into a phial, and used over again indefinitely, filling up with fresh alcohol and water as fast as it wastes with use. Any sediment will thus collect at the bottom and not be disturbed. Distilled water may then be poured on and off the plate a few times, until it will flow over it readily, and the same water used for the development. It is necessary to retain a considerable amount of alcohol in the developing liquid to prevent the film from expanding. If there be any tendency to become detached at the edges in the final washing, it is better before moistening to paint round the edges with a thick solution of india-rubber in benzole, or a mixture of benzole and chloroform, than with varnish, as the latter will be partially dissolved by the alcohol.

With regard to the increased sensitiveness, perhaps a different collodion was used of a less organic nature, or one containing a bromide, the addition of only one grain of which to the ounce of any simply iodised collodion that I have tried will increase the sensitiveness very greatly, and further addition of bromide will increase it still more.—I am, yours, &c.

November 6, 1862. C. RUSSELL.

IN PRAISE OF COLLODIO-ALBUMEN.

To the EDITOR.

SIR,—Will you kindly give me your opinion of the enclosed photograph, in your next impression? It is half a stereograph of a fall on the Falloch at the head of Loch Lomond, by the collodio-albumen process—Dallmeyer's single lens, four and a-half inches focus, quarter-inch stop; exposure twelve minutes.

I prepared twelve plates, seven and a-half inches by five, to take to Glencoe, and have eleven good negatives (the other was spoilt in development), some on the whole plate with a Dallmeyer's triplet, and some stereoscopic, of which the enclosed is an average specimen. I think I have tried every dry process in existence, except tannin; but none of them have, in my hands, the certainty of collodio-albumen, so very few will keep after exposure.

The triplet, although only advertised to cover six inches by five, covers a seven and a-half by five inches quite up to the edges without a sign of a dark corner, with first-rate definition, and with five-sixteenths of an inch stop is rather more rapid than a four and a-half inches stereoscopic lens, quarter-inch stop. The plates I prepare are very insensitive, owing, I suppose, to the thorough saltings and washings I give in order to improve the keeping qualities. I think, however, if time be not an object, that the certainty of getting pictures is much greater with slow plates than with quick ones; and, until something can be prepared to give perfectly instantaneous results, I shall always prefer slow and certain plates.

I think of trying tannin. Can you tell me if ———'s bromo-iodised collodion is well suited for it? and do you know if there has been any improvement made with regard to keeping the film on the glass without previous coating?

Apologising for taking up so much of your time, I am, yours, &c.

Nov. 11, 1862. A CONSTANT READER.

[The specimen received is well printed, the subject well chosen, and the point of view satisfactory; but the negative is considerably under-exposed, as is shown by the opacity of the falling water contrasted with the blackness of the right-hand corner. The process you have selected is undoubtedly good, but notoriously slow. The Fothergill process and the tannin process both yield plates that will "keep" after exposure as well as before. Your plates would no doubt yield more detail if you were to use heat in developing. We strongly advise you to try the tannin process. The collodion you name will most probably suit it, but it is troublesome at first to those accustomed to manipulate that of other manufacturers until they become familiar with it, owing to its containing much pyroxyline and being a trifle more glutinous than most other kinds. There has been some improvement in several of the details of manipulation besides that you indicate, and they will ere long be made public. See Major Russell's letter in the current number. We are glad to find you are so well pleased with your lens.—Ed.]

ADHERENT COLLODION.

To the Editor.

Sir,—My slides for dry plates are constructed with a strip of metal down the centre, between the two stereographs, and this strips off a slip of the film, so that, when developing, liquid gets under, and I lose my picture. Hill Norris's, however, *never* come off; nor do the films with albumen either over or under. I wish much to save the *time* occupied by extra coating—*trouble* I do not mind. Can you recommend a collodion which will stick without any aid? If you can and will, I shall be greatly obliged.—I am, yours, &c., BRIGHTON.

October 31*st*, 1862.

[We fear it is not in our power to point out a collodion that is to be relied on for this quality, and therefore publish your note in the hope that some of our readers may volunteer a statement of their experience in this direction. You are not the only amateur who is desirous of evading both trouble and loss of time in this matter—in fact, we have several querists to the same effect. Perhaps some of our correspondents will help you over the stile. Since the preceding was in type, we have received a communication from Major Russell which see.—Ed.]

TO OUR READERS AND AGENTS.—*Full price will be given by the Publisher for any of the following consecutive Numbers of this Journal, viz.:—Nos.* 158, 159, 160, 161, 162, *and* 163, *being those published between January* 15*th and April* 1*st*, 1862—*both dates inclusive.*

ANSWERS TO CORRESPONDENTS.

Hint for Colourists—*Errata.*—In a paragraph in our last, headed "Hint for Colourists," instead of reading "a solution of isinglass in spirits of wine," read "a solution of isinglass *with* spirits of wine"—five grains of isinglass, of course, not being dissolvable in one ounce of spirits of wine, which should be added to as much solution as contained five grains of isinglass.

Crux Moir.—See No. 167.

J. W. W.—Already answered.

Lovel.—Received and "made a note of."

C. D.—Received and forwarded as requested.

S. E.—Mr. Keene's address is Warwick Street, Leamington.

J. G., and John W. Davies.—Received: notice in our next.

W. D. (Newcastle).—We fear you will have a long journey, and not find us.

O. N.—Your plate was not left long enough in the sensitising bath, hence the streaks.

Hope.—We will endeavour to meet your wishes shortly, but at present we have "other fish to fry."

Res.—We have not heard of any specific intention to exhibit apparatus; but you had better inquire of Dr. Diamond.

S. R. B. H.—1. See Major Russell's letter.—2. Not long enough by half.—3. It has been so hinted to us by others, but we hope it is not the case.

Rowsley.—The card-portraits are not good. The pose is bad, and the figures are out of focus. See reply to "H. P. T." about collodion mixing.

Romeo.—Messrs. Marion, of Regent-street, have many theatrical card-portraits for sale, but we do not know whether they have the one you name. Messrs. Negretti and Zambra also have some of that class.

S. D.—The nomination of officers and Council of the Photographic Society for the ensuing year will take place at the next meeting of the Society; and, if you want to have a *real election*, you must nominate others in opposition not later than the January meeting, or the "house list" must be elected as a matter of course.

S. McW.—The portrait is not good artistically, and the background is a little "mealy." You have much too strong a *top light*—hence the heavy shadows under the eyes, nose, &c., of your sitter. The pose is ungraceful, and you have taken this specimen by far too full-face. Draw a short white blind over the head, until you lose the deep shadows under the prominent features. Avoid letting both elbows project like handles, turn your sitter somewhat obliquely, and place a greater distance between the sitter and the background.

Bon Accord, Amateur.—Your sensitising bath is strong enough for most kinds of paper, but not so for all. For toning bath make a solution of chloride of gold, say fifteen grains to an ounce of water: to this add solution of carbonate of soda, stirring after each addition till no further effervescence occurs, or until litmus-paper is scarcely altered in colour by the solution: then add water till the whole is made up to fifteen fluid drachms. Make another solution of ordinary phosphate of soda, ten grains to each ounce of water. When about to operate add one drachm of the gold solution to two ounces of the phosphate and as much water as is convenient: stir well together and allow it to repose for a couple of hours. The prints to be well washed in several changes of water, and lastly in salt and water, before immersion in the toning bath.

Inquirer.—1. About half-an-ounce in three of water.—2. You can either insert a diaphragm between the parts of the combination or use the *front* portion alone, turned with its convex side towards the collodion, and with a diaphragm at about two and a-quarter inches in front of it. We do not at all admire the French lenses of the kind you name.—3. Methylated spirit in the nitrate bath produces thinness of deposit, slowness of action, and ready solarisation; hence our caution.—4. We believe there is no international law of copyright in photographs; but a foreigner can obtain protection under the recent law in this country by simple registration. The protection to a British subject purchasing a negative from a foreigner for publication in this country must depend upon the fact of its *not* having been published before registration, and in this case we have no doubt that protection by registration is available; but as to the exact method of proceeding to ensure it you had better consult your legal adviser.

H. P. T. (Perth).—Thanks for your specimens. That of *Lynedoch Cottage* is even better, because better printed, than the preceding copy. There is a little faulty printing in *Farringdon Hall*, and the negative of the *Fall at the Rumbling Bridge* would have borne more exposure with advantage. We notice in your picture a projecting rock upon which we took our stand when at the spot, and got thoroughly soused with the spray. With respect to your film loosening, see a letter on the subject, from Major Russell, in this number. The collodion at the low rate you mention must be made with methylated ether, and is sure to be slow. As a rule, it is not good to mix *many* kinds of collodion together, as you have done; but sometimes a mixture of two very marked varieties of opposite natures is useful, such as those of Thomas's and Ponting's old kinds. It is possible that your present difficulty about intensity may arise from the accumulation of methylated spirit in your nitrate bath—a cause prolific in faults of the kind. No need for apologies.

W. D. (Woburn).—The varnish has been made with too strong alcohol, and has a solvent action on the film. The fault is not uncommon. The remedy—add a few drops of distilled water to your varnish: it will make it look milky at first, and will clear up in time. Or add some common spirits of wine (which contains water), which is perhaps a better plan. Blacking out the sky is the only way to save the negatives, if the printing through looks dirty; but the specimens received hardly require it, for we are not sure but that in the stereoscope the slight stains may suggest clouds: try them so. The white stain in 23 is very trifling, and of no moment in the stereoscope: 13 and 14 are both good, the former best. Yellow stains are very apt to appear when intensifying—sometimes from not *draining* the plate well *after washing*, and before applying the intensifying solution; but sometimes they arise from a deficiency of acetic acid when using the pyrogallic acid or silver to intensify. For this purpose it is a good plan to adopt Major Russell's method of having nitrate of silver solution ready mixed with citric acid in proper proportion to add to the pyrogallic acid. Your bridges are both good; also the clouds in No. 10; but the other part of the picture is weak and slaty, and not free from fog and other defects. Your specimens on the whole are of a very fair average.

To take card-portraits out of doors your screen with two wings should do. Have a top of stout calico. The background answers well when made of a piece of oilcloth, such as is used for floors—the wrong side outwards; and it should be painted a suitable colour—in what painters term *flatted* colour. Either of the makers you name will furnish you with a first-rate lens. We have not tried those of No. 1 for the purpose you name, but nearly all his other forms; we have, however, seen many fine specimens of the results of his lens, specially constructed for your purpose, and they are admirable; you may safely choose that—say the No. 2 lens of maker No. *one*. The address for which you inquire is 23, Rochester-road, Camden-road Villas, N.

☞ *All* Editorial *Communications*, Books for Review, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All Advertisements *and* Letters *on the* Business *of this Journal to be addressed to the* Publisher, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 179, Vol. IX.—DECEMBER 1, 1862.

Development by Aid of Ammonia.—Doubtless but few of our scientific readers will have failed to take note of the important announcement made in our last issue relative to the remarkable advantage of employing ammonia in the developer, in order to secure a nearer approach to an effective instantaneous exposure in dry-plate photography. For the communication to which we allude we were indebted to the kindness of Major Russell, whose labours towards the advance of this branch of our art have been deservedly recognised both in this country and abroad. The idea of the employment of ammonia as an accelerator originated, we believe, in America, but its successful application in a truly practical manner has been worked out by one to whom photographers, as a body, owe a large debt of gratitude, for laborious investigations faithfully and intelligently carried out, and the results freely communicated. We should have made a few comments in our last upon this subject, as casual readers might be apt to overlook the importance of it; but we had neither space nor time to spare after the receipt of the Major's communication, who, by the way, is still occupied with experiments connected with this interesting point, and who will, probably, embody this application of ammonia in the new edition of his treatise on the excellent tannin process now in course of preparation for the press.

We cannot but admire the simplicity of the mode of using ammonia adopted by Major Russell for the purpose specified, and the lucidity of his directions; and we would urge upon our practical readers an attentive re-perusal of the short article at page 425 in the last number of this Journal. At the same time, we would direct the attention of our scientific friends to the theoretical conclusion propounded, and which appears to us to be highly probable to be correct, though it will be seen by remarks in another column that an eminent chemical authority appears to have considered that the developer acts as much upon the iodide as upon the other salts of silver. This is a doubt we should be glad to see cleared up.

Photographic Copyright.—The photographic piracy of M. Gambart's engravings, and the proceedings consequent thereon, appear to have attracted a considerable amount of attention, not only in the journals specially devoted to our art, but also in others of a more cosmopolitan character. In truth, the subject is one of no small importance, and we are pleased to find that our views on the advantages of photographing engravings are shared in by so able an authority as the editor of our contemporary, the *Athenæum*. We may remark that in that publication many able articles have from time to time appeared on the subject of copyright in works of art, both before and after the passing of the Act of last session. In the impression published on the 15th ult. Mr. Corrie's decision on M. Gambart's case is discussed, and its soundness in the present state of the law admitted to be unimpeachable. But the following important conclusion is also arrived at:—

"We may also observe, that if in M. Gambart's case the copyright he claimed had been a photograph, and not an engraving, the *selling* of unauthorised copies of a copyright photograph being made penal by the Act of last session, the magistrate would have been able to convict the offender."

Observations upon the past and present mode of the production and sale of large engravings in this country, of an interesting and very pertinent character, follow, concluding with a recommendation which we have already in substance offered in our last issue, viz.:—

"The importance of bringing good literature within the means of the middle and lower classes has become undeniable. It is of much consequence to us, as a great manufacturing nation, that the same result should be accomplished as to works of Fine Art. If the prices charged for engravings were placed upon a sounder basis, and photographs of them published by the proprietors of the copyrights in such engravings, so as to bring the *design* within the means of all classes of the public, we believe that not only would pirates be driven out of the market, and the public largely benefitted by the wide diffusion of good designs, but that the gains of all parties interested in the production and sale of engravings would be largely increased."

Photographers may rest assured that a very wide field for the profitable employment of their labour will, ere long, be opened to them in this direction; for, instead of there being any disadvantage in having engravings photographed, there would appear to be in the facility afforded for registration under the new Act a positive safeguard to the proprietors, or to those who should be the proprietors, of the copyright.

Acari in the Nitrate of Silver Bath.—In another column will be found a further communication from our esteemed friend, Dr. Maddox, relative to some of the habits of the *Acari* found by him in his nitrate of silver bath after its seclusion from light and air for some months, the particulars of which were published in our impression of May 15th, 1862. The present article has arisen from the circumstance that another correspondent, Mr. Sterry, found similar living creatures in his photographic dark room (which had formerly been in use as a harness-room), specimens of which were forwarded to Dr. Maddox by Mr. Sterry. The matter being of interest to microscopists as well as to photographers, we brought it before the Microscopical Society at its last meeting, on which occasion Mr. Sterry also was present. Several living specimens were displayed under the binocular microscope, and it was evident that Dr. Maddox's and Mr. Sterry's specimens were identical; and, on comparing them with cuts representing the *Acarus Crossi*, there was no doubt of their being also of the same species. Of course the singular part of the business is the fact of their existing alive for a lengthened period of time in such a corrosive solution as that of nitrate of silver in one case, and a strong mineral acid in another. The explanation of the matter, however, is simple enough. The locality not being one of selection nor natural to those beings, but they having been accidentally placed in the bath, sufficient resistance to the unfavourable position was offered to enable the creatures to remain alive, and this resistance appears to have been effected by an abnormal and copious secretion of fatty matter in which they were encased, as it were, and thus protected from the corrosive action of the fluid,—those found in Mr. Sterry's laboratory having been free from this fatty secretion. Another singular circumstance was mentioned by Mr. Sterry, viz., that not only did his dark room swarm with these animals, but he had been able to detect no fewer than six different species of *Acari* there.

SOME ADDITIONAL NOTES ON PLAIN WASHED COLLODION FOR DRY PLATES.*

By W. Hislop, F.R.A.S.

About twelve months since I directed the attention of the members of this Association to the fact that no preservative whatever is required for dry collodion plates; but that they retain their sensitiveness in every way unimpaired, and allow of the development of the impressed image better without than with the imposition of any of the numerous substances, simple and compound, the use of which has been advocated by various manipulators.

Some gentlemen were unwilling to believe this, and, when the results were shown, they attributed them to various causes. Others averred that they could not succeed, and that it could be done by no one but myself. Some said it had been done before, but not a few have expressed to me their acknowledgments for calling their attention to so simple and certain a means of obtaining good pictures.

Since that time I have, as an amateur, continued to use the method then advocated as the best means I know of obtaining pictures on dry plates, and with more than the success of which I then spoke. The details of the manipulation remain substantially the same.

It may be remembered that I found the film very loose after being again wetted, if the plate were not previously coated with some adhesive substance. Being in the habit of using a very weak solution of albumen as a substratum for wet collodion, I employed that for the dry plates and found it satisfactory. I subsequently tried India-rubber or gelatine in solution, but found neither of them so perfect nor so simple as very dilute albumen. I had observed, however, that the pictures were more full of detail and half-tone when the film was supported by the bare glass only; but until lately I have not been able to find a collodion which would adhere with sufficient firmness to render it safe. The plates I have principally used have been stereoscopic size, or else nine inches by seven; and I have found the larger plates equally as certain and satisfactory as the smaller ones. In this process, however, as with every other in dry plates, it is absolutely necessary that the drying process should be quick and uniform if we wish for evenness of sensibility and intensity. I have not been able yet to use any method of artificial drying; but a close observation of what takes place in plates which have dried slowly leads me to conclude that the longer the film remains wet the more insensitive it becomes, leading, if the drying be unduly prolonged, to stains and patches towards the end which has remained wet for the longest time.

The exposure I have employed has, of course, varied with the subject. From one to five minutes with a six-and-a-half inch focus lens and a quarter-inch stop has been the usual time; while for an orthographic lens, of seventeen inches equivalent focus, I have used from five to fifteen minutes with a five-eighth stop for the same subject.

I have kept the plates for three months without any sensible alteration. After exposure I have kept them fourteen days before development, and am not aware that they were any the worse; but I have not experimented in this direction, being generally desirous of seeing results in as short a time as possible. I may here remark that I believe that numbers of dry plates are spoiled from being kept in boxes which are not air-tight. If I am travelling, or likely to keep the plates for any length of time, it is my practice to paste strips of gold-beaters' skin or varnished paper over all openings to exclude the exterior air as far as possible. We can never tell where the package may be placed, or what deleterious fumes may envelope it. Plates that are kept in a box on a shelf near the ceiling of a room where gas is burnt, for instance, will very soon be spoiled.

In most of my successful plates I have used Ponting's negative collodion, but within the last two months I have succeeded in obtaining a collodion which has turned out to be a great improvement, inasmuch as it brings plain washed collodion for dry plates very nearly on a par with collodion in its wet state for sensitiveness, while it is superior for detail and as simple in manipulation.

The collodion in question is Ponting's bromo-iodised collodion. With this I now obtain a landscape in thirty seconds with a four-and-a-half-inch focus lens, in a moderate light, while the details of foliage in shadow are beautifully defined. This collodion needs no substratum: it dries rapidly, and gives a beautifully clean and intense picture with an old nitrate bath.

I believe that the best method of promoting photography, especially among amateurs, is to endeavour to indicate those materials which are in the market, and can readily be obtained, rather than to make experiments on a necessarily small scale which are likely to give different results under different circumstances.

To those who would like to save their time and obtain pictures I can confidently recommend this method of manipulation; and, in order to make it as plain as possible, I will briefly state precisely the course I have found the easiest.

The collodion is Ponting's bromo-iodised collodion.

The bath is the ordinary thirty-grain negative bath, slightly acidified with acetic acid.

The developer is six grains of pyrogallic acid to six grains of citric acid in four ounces of water. To this is added one or two drops of the nitrate bath, as may be required.

The plate is cleaned, coated with collodion, and immersed in the bath. When uniformly sensitised, it is placed in a large dish filled with common water. I use New River water. The next plate is then prepared, and so on till the first dish is full. After agitating the water backwards and forwards, the plates are taken out one by one and placed in a second dish, taking care that each plate is an equal time in the water. This is done once more, and a little salt is mixed with the water in the last dish. The plates are then taken one by one, and a stream of water allowed to fall upon them from a jug or tap, with some force, to remove any particles of chloride which might adhere to the film, and produce transparent pinholes. They are then set up on one corner to dry, taking care to draw off the moisture by blotting-paper.

If it be suspected that organic matter exists in the water, it is desirable to immerse the plate after the final washing for a short time in distilled water, or the negative may be found to redden in colour towards the edge which has been lowest in drying.

After exposure the plates are placed in a dish of water for a few minutes and then developed, taking care that the developer flows equally over to the edges of the plate. The resulting picture is as nearly as possible of the same colour and intensity as if exposed and developed while wet.

In certain conditions of the bath—especially if it be new—it may happen that there is a want of intensity. A very small quantity of common resin should then be added to the collodion, considerably less than is used in the resin process, perhaps not exceeding a quarter of a grain to the ounce. In this way almost any intensity or colour may be obtained.

I have not tried the effects of other resins sufficiently to speak positively of them, but I am disposed to think that shellac will prove better than any.

I have only further to remark that if I have not been sufficiently clear, I shall be happy to explain any detail or give any further information I may possess.

* Read at a meeting of the North London Photographic Association, Nov. 19th, 1862.

QUALITATIVE ANALYSIS.

A SERIES OF LESSONS WRITTEN WITH A SPECIAL VIEW TO THE REQUIREMENTS OF PHOTOGRAPHERS.*

By Emerson J. Reynolds.

Previous to testing any solution for acids, whether organic or inorganic, certain conditions must be fulfilled, otherwise the analysis will be rendered much more difficult, and, as a consequence, accurate results cannot be so easily obtained, more particularly by those who have not much experience in analytical chemistry. In fact, we may remark, *en passant*, that whereas the detection of the inorganic acids is a very simple and easily-executed task, the correct separation of many of the organic acids is by no means so certain a process in unpractised hands; and we should therefore recommend the student to look on the class reactions hereafter described as merely serving to indicate the very probable existence of a particular acid, and not to rely solely on the information thus gained, but in every instance to obtain corroborative evidence where possible. The conditions to be realised are as follow:—

1. The solution should contain no metallic oxides save those of the fourth and fifth groups. If any other bases are known to exist in the liquid they can be easily separated by adding excess of the general reagent for the group or groups to which they severally belong.†
2. *Silicic acid*, if present, should be separated. This is easily accomplished by evaporating the solution to dryness with excess of hydrochloric acid: if silica be present, on re-dis-

* Continued from page 427.

† Arsenious and arsenic acids are thus separated by sulphuretted hydrogen, and chromic acid is reduced by this reagent, sulphur being separated and the solution taking a *green* tint, owing to the metallic acid being reduced to the sesquioxide of chromium, all the salts of which have a fine green colour: the latter is then precipitated by the general reagent for the third group.

solving in water a white insoluble residue of silicic acid will be left. In this case the volatile organic acids, together with *iodine* and *bromine*, must be tested for in the original solution, since they are driven off by this treatment.

3. A few drops of the neutral liquid should be evaporated on platinum foil, and the residue heated strongly. If blackening occur organic matter is present. If no carbonisation take place no organic acid can be present, and the inorganic acids need only be sought for.
4. If ammoniacal salts are present they must be got rid of by boiling the solution for some time with excess of potash: the solution is then neutralised with nitric acid, and the testing proceeded with. This precaution need only be taken where *boracic*, *tartaric*, or *citric acids* are pointed out in the preliminary examination.

NOTE.—It is always necessary before commencing an analysis to ascertain whether any acid be present which is capable of being volatilised on the addition of a stronger acid. For this purpose we take a portion of the *original* solution, and add some sulphuric acid. If any effervescence take place the gas evolved must be examined as to its odour. If it smell of rotten eggs *sulphuretted hydrogen* is present; if the odour resemble that of a burning match, *sulphurous acid*. *Hyposulphurous acid* gives the same pungent gas, but *sulphur* at the same time separates from the solution. *Hydrocyanic acid* possesses a strong odour resembling that of bitter almonds. If the mixture be now boiled the presence of *acetic* acid will be indicated by the well-known smell of vinegar. Since carbonic acid is inodorous it might escape detection unless some special means were taken to ascertain its presence; therefore we decant the gas floating above the liquid by gently depressing the mouth of the test-tube as far as possible without allowing any of the liquid to pass out, thus pouring the dense gas into another tube containing some *lime water*. The mouth of the latter is now closed by the thumb and violently shaken, and if the lime water become turbid *carbonic acid* is present. *Sulphuretted hydrogen* may be easily recognised by holding a piece of bibulous paper, moistened with a solution of acetate of lead, at the mouth of the tube from which the gas is evolved: if the paper be blackened sulphuretted hydrogen is present.

5. In cases where the volatile acids exist they must be driven off by boiling with hydrochloric acid, and the excess neutralised with potash.

We thus have the solution properly prepared for examination. Now place a few drops in a test-tube, and add a little solution of *chloride of barium:* if a white precipitate be produced, which does not dissolve on warming with some strong nitric acid, *sulphuric acid* is certainly present. Our next step is to take another portion of the liquid and dilute it (if sulphuric acid has been found), and then add solution of *chloride of calcium*, having previously added a few drops of chloride of ammonium if *citric acid* be suspected. If no precipitate be formed, even on boiling, no other acids of this group can be present; if a precipitate be produced it may contain *phosphate*, *oxalate*, *borate*, and *tartrate of lime*, and *fluoride of calcium*. This is thrown on a filter, and the liquid which passes through boiled strongly: if this causes the formation of a white precipitate, which re-dissolves as the liquid cools, *citrate of lime* is present. The precipitate on the filter is now well washed, and divided into two portions, which we shall designate respectively A and B.

Treatment of A.—This is placed in a test-tube, and *acetic acid* poured over it, and digested for a little time. If it dissolve entirely, neither oxalic or hydrofluoric acids can be present; if a residue, insoluble in acetic, but soluble in hydrochloric acid, remain, it consists of *oxalate of lime:* anything insoluble by digestion with hydrochloric acid must be *fluoride of calcium*. We now take the acetic solution, and add excess of ammonia: if a white precipitate be produced *phosphoric acid* is probably present, and is confirmed in the original solution, which must likewise be examined for *boracic acid*.

Treatment of B.—This is agitated for some time with a solution of caustic potash. If not completely soluble the residue is allowed to subside, and the clear supernatant liquid decanted into another test-tube, and boiled: if a white gelatinous precipitate be formed, which re-dissolves as the mixture cools, *tartrate of lime* is present.

We next turn our attention to the detection of chlorine, iodine, bromine, and cyanogen. A portion of the *original* solution is acidified with nitric acid and warmed: if necessary, it is then filtered, and excess of nitrate of silver added. If a precipitate be formed, it is digested with nitric acid: if complete solution do not take place, the insoluble matter contains the silver compounds of one or all the above-mentioned bodies. This residue is digested with ammonia for some time, which dissolves *chloride*, *bromide*, and *cyanide of silver*, leaving the *iodide* unacted upon. The three former salts are again precipitated on supersaturating the ammonia with nitric acid. Having thus ascertained the presence of iodine, and the probable existence of one or other of the remaining bodies in the liquid, the student should examine small and separate portions of the original solution for chlorine, bromine, and cyanogen, and likewise for the organic acids, if the preliminary examination has led him to suspect the existence of such.

We shall now give a brief description of the most characteristic reactions of the acids which we have already enumerated.

ACETIC ACID.—In its most concentrated state this acid forms a hydrate which crystallises below 60° F., possessing the well-known odour of vinegar. Acetates, when heated with sulphuric acid, give off acetic acid, which may be thus most conveniently detected. If an acetate be heated with sulphuric acid and alcohol, *acetic ether* is formed, which may be recognised by its agreeable and refreshing odour.* *Sesquichloride of iron* does not produce any change with acetic acid, but with neutral acetates a deep reddish brown colouration is produced, owing to the formation of peracetate of iron. This colour is not discharged when chloride of mercury is added.

BENZOIC ACID.—The pure acid generally occurs in the form of a white crystalline powder, very light, volatile, and having an odour strongly resembling that of gum benzoin, of which it is a constituent. A neutral solution reacts as follows:—With *sesquichloride of iron* a buff-coloured precipitate is produced, from which free ammonia abstracts the acid, leaving peroxide of iron. If the solution be moderately strong and excess of sulphuric acid be added, benzoic acid separates after a little time as a sparingly soluble crystalline powder.

BORACIC ACID.—This acid is a solid, crystallising in brilliant scales, which are greasy to the touch. It may be sublimed with aqueous vapour, but is fixed *per se*. It is destitute of odour, has a faint acid taste, and is but slightly soluble in water; it is therefore always separated from strong neutral solutions on the addition of sulphuric acid and boiling. The following is a useful test for this acid in its saline combinations:—Place a little of the salt in a small capsule and moisten it with a few drops of sulphuric acid; then add some spirits of wine and warm the mixture, which, when nearly boiling, is to be set fire to. If boracic acid be present the flame of the alcohol will be tinged a bright *green*.

CARBONIC ACID.—Direct and conclusive evidence of the presence or absence of this acid is always obtained in the preliminary examination, therefore its characters need not be further discussed here.

CHLORIC ACID.—This acid, in its most concentrated form, is a yellowish, oily liquid, very unstable when in a free state. It forms saline compounds with metallic oxides, which are all decomposed by heat with evolution of oxygen, while a chloride of the base remains behind. If a *chlorate* be heated on platinum foil with a very little powdered sugar, violent deflagration takes place. When moistened with strong sulphuric acid, chlorates evolve a deep yellow gas, which explodes if the temperature be raised. By this reaction chloric is readily distinguished from nitric acid. Neither the acid or its salts give any precipitate with nitrate of silver.

CITRIC ACID.—When pure, this acid forms large colourless crystals, having an agreeable acid taste. When heated to redness it is carbonised, at the same time evolving a pungent acid vapour. Neutral citrates give a white precipitate with *chloride of calcium*, readily soluble in ammoniacal salts, from which solution a basic citrate of lime is precipitated by boiling, and re-dissolved on cooling. *Lime water* gives no precipitate in the cold, but, on boiling, the basic salt above referred to is thrown down. By this reaction we can distinguish between citric and most other organic acids.

FORMIC ACID.—When formiates are heated with any strong acid formic acid is driven off as an irritating vapour. When heated with a solution of nitrate of silver the metal is immediately reduced. If a neutral formiate be added to a solution of corrosive sublimate, at first a white precipitate of calomel is formed, and finally, on boiling, the metallic mercury is reduced in the form of a grey powder.

GALLIC, TANNIC, and PYROGALLIC ACIDS closely resemble each other in properties, and may be most conveniently considered

* The *sesquichloride of iron* is prepared by dissolving hydrated peroxide of iron in strong hydrochloric acid with the aid of heat. Solution of carbonate of soda is then gradually added until a permanent brownish precipitate is apparent, which does not disappear on agitation. The liquid is then diluted and filtered.

together. All these give bluish-black precipitates with a mixture of per and protosalt of iron. If a strong acid be added to a solution containing *tannic acid*, a pasty precipitate is thrown down. A solution of gelatine or a piece of animal membrane completely removes *tannic acid* from solution. *Gallic acid* does not exhibit either of these reactions, but is much less soluble in cold water. *Pyrogallic acid* may be easily distinguished from these and almost all other acids by giving a beautiful purple-red colour when dropped into *milk of lime*, the rich tint of which speedily changes to dirty brown. This is a very characteristic reaction.

Hydriodic Acid *(Iodine)*.—With *iodides* nitrate of silver produces a pale yellow precipitate insoluble in nitric acid, and almost so in ammonia. A solution containing two and a-half parts of protosulphate of iron and one part of sulphate of copper precipitates iodine from its solutions as a dirty white sub-iodide of copper. Corrosive sublimate (chloride of mercury) gives a brilliant red precipitate easily soluble in excess. The most delicate test for iodine is *starch paste:* if a little of the latter be mixed with an iodide no change is produced, but on the addition of a drop of nitric acid a beautiful *blue* colour is developed.

Hydrobromic Acid (*Bromine*).—With nitrate of silver this body gives a pale yellow precipitate, insoluble in nitric acid, and soluble with difficulty in ammonia. With starch paste and nitric acid bromides give an *orange-yellow* colour. Bromides when heated with strong sulphuric acid evolve bromine as a deep brownish-red vapour. The best method of testing for bromine is the following:—Dissolve the suspected salts in some water in a test-tube; then add a litt e solution of chloride of lime (bleaching powder), and a few dropsl of hydrochloric acid, and finally pour in some ether and agitate well. Chlorine is evolved: this sets free the bromine, which dissolves in the ether and rises to the surface with it. If the etherefal solution be now decanted and evaporated with the addition o some caustic potash, a residue will be obtained, which can be tested by starch for bromine.

Hydrocyanic Acid (*Cyanogen*).—Although this acid has been detected in the preliminary examination, it is advisable, particularly if *mercury* be present, to apply the following test:—Add to a little of the suspected liquid a solution of protosulphate of iron which has become rather brown, and an excess of potash; now digest the mixture slightly and add excess of hydrochloric acid: if a blue compound remain undissolved *cyanogen* is present. Where the quantity is very small a *greenish* colouration only is produced.

Hydrochloric Acid *(Chlorine)*.—Chlorides, when heated with sulphuric acid, give off hydrochloric acid; but if a little peroxide of manganese be present, chlorine is evolved. With *nitrate of silver* a white curdy precipitate is produced, which is blackened by light and is soluble in ammonia; with *acetate of lead*, a white precipitate, soluble in boiling water. *Berzelius* gives the following simple method for the detection of chlorine:—Place a drop of a weak solution of sulphate of iron on a bright piece of silver, then add the compound, and if chlorine be present the silver will be blackened.

Hydrofluoric Acid *(Fluorine)*.—The existence of this acid is sufficiently demonstrated by the insolubility of the lime salt in hydrochloric acid.

Hydrosulphuric *(Sulphuretted Hydrogen)* and Hydrosulphurous are always detected in the preliminary examination, and do not require confirmation.

Nitric Acid.—The nitrates deflagrate like the chlorates when heated in contact with organic matter, but not so violently. Unlike the latter, they do not give off a deep yellow gas when moistened with sulphuric acid. If to a solution suspected to contain this acid we add a little sulphuric acid, and then drop in a crystal of pure protosulphate of iron, a brown halo will be formed round the latter, on gently warming the liquid, if nitric acid be present. Again: if another portion of the acidified solution be boiled with slips of *copper*, ruddy fumes will be produced, indicative of nitric acid.

Oxalic Acid.—The most characteristic reaction of this acid has been already pointed out, viz., the formation in neutral or alkaline solutions of a lime salt insoluble in acetic, but soluble in hydrochloric acids.

Phosphoric Acid.—One of the most reliable reactions by means of which this acid can be detected is the following:—Sulphate of magnesia (Epsom salts) is added to the suspected liquid, then chloride of ammonium, and finally excess of ammonia: the whole is well agitated, and allowed to stand for some time. If a precipitate be formed either immediately or after standing, phosphoric acid is present.

Silicic Acid.—This acid is always detected by evaporating the solution to dryness with excess of hydrochloric acid, and re-dissolving in water. If a white powder remain insoluble, *silicic acid* is present.

Sulphuric Acid.—The existence of this acid in a solution is always demonstrated by its reaction with a salt of baryta, as already described.

Sulphurous Acid.—The preliminary examination proves at once the presence or absence of this acid.

Tartaric Acid.—With *chloride of calcium* tartaric acid gives a white precipitate soluble in potash, from which it is again precipitated on boiling. When a concentrated neutral solution of a salt of potash (preferably the *acetate*), together with a little alcohol, is added to *free* tartaric acid, a white crystalline salt—the bitartrate of potash—is thrown down.

In our next article we shall give a brief account of blow-pipe manipulation, and then pass on to the special analysis of collodions, developers, and other solutions generally used in photography. By this means we shall illustrate the application of the principles already enunciated.

(To be continued.)

PRINTING ON RESINISED PAPER AND SILK.*

By H. Cooper, Jun.

With your permission, I should like to make one or two remarks upon printing on resinised paper and silk. The Editor of The British Journal of Photography says that the comparison does not lie between albumenised and resinised paper, but between resinised and plain paper. I do not think this is quite correct, and I will give my reasons. In the first place, we wish to dispense with albumenised paper, for two reasons,—the highly-glazed appearance of the prints, and the great probability of their fading, caused by the silver retained in the albumen. If we dispense with it we must have a substitute. Now, hitherto plain paper—the surface either prepared with arrowroot, gelatine, or Iceland moss—has been the only one known. Resinised paper is, I think you will all admit, capable of giving better prints than either of these, and is, therefore, the best known substitute for albumenised paper. From this it follows that the comparison is between resinised paper and albumenised, as well as between resinised and plain paper.

In a paper read at the last meeting of the North London Photographic Association I called attention to several disadvantages in the resinised paper. Some of these I have since removed; and I do not doubt that, if gentlemen engaged in the art of photography will give a little attention to the subject, they may *all* soon be remedied, and the prints produced upon resinised paper be equal, if not superior, to those upon albumenised. The decomposition of the paper after sensitising was the first. Determined to find from which of the resins it proceeded, I prepared several pieces of paper in the following ways (all the solutions of resin containing fifteen grains of chloride of calcium to the ounce):—Mastic alone, frankincense alone, Chio turpentine alone, and various combinations of these three resins. I then sensitised a sheet of each, and also one of albumenised paper, hung them all up to dry, and carefully watched every day for a fortnight the progress of the decomposition. The results showed that the mastic alone kept the longest, the frankincense and mastic next, frankincense alone and albumenised paper next, while all those pieces containing Chio turpentine turned yellow very rapidly. The formula I now recommend is—Mastic, 8 grains; frankincense, 10 grains; chloride of calcium, 10 to 15 grains; and 1 ounce of spirit. This solution is easily filtered through paper, so that it can be used directly the ingredients are dissolved.

Another sore point in the process was the granular appearance of the proofs. Subsequent experiments confirmed the idea I then held that it was due to the paper itself; but I find that it is increased by using too large a proportion of resin. With the formula just mentioned it does not appear to so great an extent on the same paper as with the old formula, but with a suitable paper I have entirely got rid of it. Thin negative Rive has given the best results: yet it has one objection,—it is very liable to tear in washing. I think that the use of a little stouter paper might prevent this. The prints also possess greater transparency and brilliancy in the shadows, and the lights are much purer, if printed on a suitable paper, immersed in the resin solution just recommended.

It has been said that all resins become yellow by exposure to the air. This they certainly do, but some to so slight an extent as to be of very little consequence in the paper prints. I am of opinion

* Read at a meeting of the South London Photographic Society, November 13th, 1862.

that paper prepared with a small quantity of frankincense and mastic will become yellow much slower than albumenised paper; and I even doubt if it would become more yellow than plain paper, for this reason:—It is a well-known fact that ordinary paper becomes very much discoloured by keeping, whether exposed to the light or not. Now, if each particle of the paper be encased or "locked up" in a resin, I contend that it will be so far protected from atmospheric influence as to remain a pure white much longer than if it were left unprepared; and I do not think that the discolouration of the resin will make it so yellow as the unprepared paper.

The Editor of *Photographic Notes* recommends a solution of lac for preparing the paper. My own experience tends to show that this resin is totally unfit for the above purpose. When an alcoholic solution of lac is evaporated, cold, the resin is left in a semi if not entirely transparent state. If paper be immersed in a solution of it and dried, the thinner portions of the paper will be rendered more or less transparent, which will cause the prints to be very mottled and granular. I may be wrong, but this is the result of my own experiments. I tried to use lac three or four months ago, and met with no success.

I find that my meaning in the following sentence has been much misunderstood, and perhaps it may not be out of place to explain it here a little more fully:—"The chloride being, moreover, *locked up* in a resin does not, in my opinion, form as much chloride of silver as it would do if it were employed in albumenised paper." What I meant to infer was this: that the particles of chloride are so thoroughly encased that it is with great difficulty that the nitrate of silver can get at them to form chloride of silver, even after a long floating. I do not mean to say but that after very prolonged contact with the nitrate bath it might *all* be decomposed; yet by a floating of five or ten minutes some of it will remain unchanged. But then the question arises, "if it be so encased as to remain unchanged under the influence of nitrate silver, how can it be removed by water, as a chloride would be very objectionable in the finished proof?" But it seems to me that the long immersion in water, consequent upon a thorough washing, is quite effectual in removing it. And if the most infinitesimal portion remain, how can it be injured by atmospheric influence when it is proof against the attack of silver and water? Should my meaning in the "locking-up" theory be still obscure, I shall be most happy to answer any questions that may occur to any of you.

I have been making some very interesting experiments on resinate of silver.

I have here a print produced by the direct action of light upon resinate of silver. The compounds formed from the different resins and nitrate of silver vary considerably in their character, as regards their sensitiveness to light and their colour after exposure. Those formed from common rosin and Chio turpentine are the most sensitive. The specimen print was prepared with Chio turpentine, frankincense, and mastic. The resined print also receives the latent impression very rapidly, which may afterwards be very satisfactorily developed. It is from this fact that I attribute the very short time required to print by development on resinised paper. I may mention that I have produced good prints by development on resinised paper, of a nice tone, and entirely free from mottleness and measles, by soaking in distilled water before developing.

I had hoped to have printed some pictures on iron instead of silver on resinised paper, but have utterly failed to produce anything worth showing. I hope others may be more successful, for I think it is a very good line to follow up,—the dispensing with silver and hypo. in photographic prints.

It is worthy of mention that since I have used Sutton's neutral chloride of gold I have had much less difficulty and vexations in toning all kinds of paper prints than hitherto.

I will now say a few words on the formula for printing on white silk, which I sent to the *Photographic News* of last week. I think I cannot do better than read those remarks:—

"I have tried several formulæ, and, although Iceland moss gave very nice results, I prefer to use a small quantity of a resin to give a surface to the silk, to prevent the image sinking too much into its substance. A great deal depends upon the silk, so that the first point is to procure a suitable kind. It must be rather stout and opaque, and very perfect in the thread. The best French glacé answers very well, if it be of really first-rate quality; but I should think *gros de Naples* would do better.

"Ascertain which is the right side and mark it. As the silk will require to be ironed once or twice during the preparation, some fine flannel must be obtained, and three or four thicknesses laid on a board: this is to form the material to iron upon. If there are any creases in the silk, lay it face downwards, and over the back place a sheet of fine filtering-paper, and then iron it until they disappear. Then prepare the following solution:—

Pure frankincense	4 grains,
Mastic	2 grs. or 3,
Chloride calcium	15 grains,
Spirit	1 ounce.

Filter before use. Immerse the silk in the same manner as I directed for paper, but pin it up by two corners. To sensitise it, *immerse* in the silver bath, which should be sixty grains to the ounce, and faintly acid. Several pieces of silk may be immersed at the same time, so long as they are put in separately. This will save time, as they must remain in the bath at least a quarter of an hour. Turn the batch over, and remove the pieces singly, and again pin up by two corners. When the silk is quite dry, it is to be ironed, before exposure in the printing-frame, in the same manner as I have described before. If this be neglected, the silk is very apt to cockle, rendering the prints misty in parts. The covering the back with clean filtering-paper, both in the ironing and in the pressure-frame, must on no account be omitted.

"Print deeply; wash quickly; and tone in a bath of acetate of soda and chloride of gold, rather strong. Tone to the required depth; *wash well;* and fix in new hypo.: this should be also rather strong. Wash very carefully and thoroughly, taking care that no impurities come near the prints, as the silk is easily soiled whilst wet. If the prints be small and are intended for book-markers, or things of that description, they may be simply dried and ironed; but should they be large, for screens, &c., they must be stretched, whilst wet, over a frame, and left to dry in a state of tension. Although the manipulations are rather tiresome, the photographer will be amply repaid by the results. The prints are brilliant in the extreme, the shadows are particularly deep and transparent, and every detail in the negative is perfectly rendered on the silk. The uses to which this style of printing may be put are almost numberless, and I would recommend it to the attention of all photographers."

I have brought a print with me to show why the silk must not be floated on the nitrate bath. You will notice that the threads of the silk show very plainly, totally destroying all the beauty of the photograph. I will endeavour to explain the reason of this. Silk is a fabric composed of threads of greater or less size, according to its kind. The glacé silk, on which the specimens were printed, is rather large in the thread, which, curious as it may seem, appears to give greater brilliancy to the prints. Now, when the prepared silk is laid upon the surface of the nitrate of silver, the solution filters through, and runs over the edge of the threads; but in its progress it is bereft of its silver, so that a solution containing very little, if any, silver remains on the other side of the silk, and dissolves out, to a certain extent, the unchanged chloride; and, when the silk is removed and hung up to dry, it finds its way back again to the surface that is to be printed upon, and, uniting with the free nitrate, deposits chloride of silver irregularly, which renders the image blotchy and weak. You will therefore see that the *immersion* in the silver bath can on no account be dispensed with. The photographs on silk may be washed, without injury to them, in soap and water, when they become soiled or dirty. This is best done by laying the silk on a sheet of glass, and scrubbing it back and front with a brush or sponge: it may then be ironed in the usual way, or stretched as I mentioned before. I have tried printing on silk by development, but with no very good results; also printing on cambric and muslin, with what success you may judge from the specimens before you.

In concluding this paper, I must ask you to excuse any faults in it, as it was only written this afternoon.

NOTES ON INSTANTANEOUS SHUTTERS.*

By George Dawson, M.A.,

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I am desirous of occupying your attention for a very short time in describing a few of the more serviceable mechanical appliances that have at different times been employed for obtaining the so-called instantaneous photographs, and for regulating the exposure at the will of the operator. Some of these are nearly as old as photography itself; and one, which I shall describe, has been dug from its ashes and recently patented.

The first attempts at instantaneous photography would obviously be made by suddenly uncapping and recapping the lens. An improvement would at once suggest itself to every intelligent operator, viz., to use a black screen or the focussing-cloth in front of the lens, and by an adroit and rapid movement to allow the light to fall evenly on the lens without shaking the camera. In some respects this method has an advantage not possessed by any of the more complicated apparatus which I am about to describe. As respects instantaneity, it fails in giving us that high degree absolutely necessary to fix even slowly-moving objects as if they were at rest. Nevertheless, a slight modification in the shape of a Scotch cap has already given us many of our finest gems of moving clouds and water, in Wilson's sea views.

The second kind of shutter, perhaps, in order of time, was the flap shutter, opening by a hinge on the top of the lens. This was

* Read at a meeting of the North London Photographic Association, Nov. 19th, 1862.

in use before collodion was dreamt of, and fitted to a camera more than eighteen years ago, by Mr. Ross, of Featherstone Buildings. M. Gaudin about the same time seems to have used a similar arrangement, and also M. Claudet, who contrived an ingenious plan for opening it by means of a piece of string over the camera. I observe, at the present time, that many operators—particularly for stereoscopic purposes—have adopted precisely the same apparatus; and, on inquiry, I find it answers extremely well for compound lenses, inasmuch as the foreground must necessarily receive a considerably longer exposure than the sky, and that exactly in proportion to its nearness.

Nearly contemporaneous with the above, but probably a little later, Dr. Leeson had many contrivances, by means of spring blinds inside the camera, for regulating the exposure at pleasure. He also, by moving about a blind in front of the exposed Daguerreotype plate, whilst the foreground was being acted upon, obtained fine effects of clouds and atmosphere, while the darker objects were well defined. I have unfortunately not been able to obtain any models of his contrivances for your inspection; nor, perhaps, is it much to be regretted, for I daresay that at the present day they would be more curious than useful.

I have to come down to the first year of the Photographic Society, after collodion had been well established, before I find any novelty introduced worth mentioning. In the *Journal of the Photographic Society*, Vol. I., p. 162, Jan., 1854, there is described and figured, by Mr. Montefiore Levi, an apparatus which it seems he had employed for some time previously for obtaining the nearest approach to instantaneous exposure that had hitherto been attempted. It is extremely ingenious and rapid in its action, and opening first and closing last over the centre of the lens. I have here a rough model which I made a short time ago, with a penknife and a sixpenny saw, from Mr. Levi's description. I have adapted it for two lenses, but it might quite as easily be fitted for four, the principle and action still remaining the same. Observe my rude handicraft, and see on the other side how the admirable mechanical skill of one of Mr. Ross's workmen, at the first attempt, has transformed it into a neat little instrument, almost too good-looking for such rough purposes. Now this is the identical instantaneous shutter which has recently been patented—not by Mr. Levi, but by another gentleman, who, I have no doubt, was quite unaware of its previous publication. Mr. Dallmeyer (who is not the patentee) has kindly enabled me to show you a specimen of the patent model just received, which, although differing considerably in shape from the other, inasmuch as it acts across the lenses, is essentially the same in principle. Whether these shutters will answer well in practice remains yet to be determined. For my own part I doubt much whether it would be advisable to give the centre of a picture a longer exposure than the margin; for in using compound lenses, from their very construction, the former without longer exposure has already more than its proper share of light.

In December, 1854, Mr. Wilkinson, gunmaker, 27, Pall Mall, exhibited before the Photographic Society—although not described in its Journal—a model of a double flap, or, as he designated it, cat's-eye shutter, opening from and shutting at the centre of the lens, as in Mr. Levi's invention, but differing widely from it in principle. Mr. Latham, Mr. Wilkinson's successor, has kindly lent for your examination the model I now hold in my hand. Its action, as you may observe, is extremely simple and ingenious, consisting merely of two flaps, opening simultaneously from the centre of the lens by means of a double lever worked from the side. I am inclined to think that this is the best model of a flap shutter yet described. It is simple, not easily deranged, occupies little space, and allows the operator to lengthen or shorten the time of exposure at will.

Here is another contrivance of Mr. Wilkinson's, of a previous date, which acts, as you see, by means of a hole in a spring roller blind fixed in front of the lens. Instead of the blind, a board with a rectangular hole in its centre will also give a very rapid exposure by falling on the principle of the guillotine. I do not think this mode is likely to come into general use.

About a year ago Mr. Window, of Baker Street, brought into notice a double-acting blind placed in front of the lens, acting over a roller. Before exposure a flap is raised to protect the lens from diffused light; and, at the proper time, by gently pulling a string the blind begins to uncover the lens from the bottom, and the moment it reaches the top, by continuing the pull, the other side of the blind covers from the top downwards, thus giving an exposure lengthened in proportion to the nearness of the objects included in a general view.

The instantaneous shutter of Messrs. Horne and Thornthwaite may be briefly described as consisting of a sheet of metal so arranged as to freely slide up and down behind and in contact with the front board of the camera holding the lens or lenses. This metal slide has an aperture in the centre corresponding with that of the camera-lens, and the portions which are above and below the opening are of sufficient area to perfectly close the lens when the plate is either at the top or bottom of its sliding groove. When the slide is raised to the top, a slight spring retains it in position. The aperture of the lens is now perfectly closed; but when the spring is touched the plate is liberated, and, quickly sliding down its groove, rapidly exposes the full aperture of the lens and again rapidly closes it.

The last contrivance to which I shall call your attention this evening is that of Mr. England. He has forwarded a model which you see has been subjected to some hard work—very probably has done its part in producing those instantaneous views of Paris with which we are all familiar. It acts on the guillotine principle by means of a slot falling immediately in front of the sensitive plate; and by a simple arrangement this slot can be lengthened or shortened, so as to vary the time of exposure. Each part of the picture receives the full power of the lens during the time it is acted on by the light; and, although all parts of the plate are not acted on precisely at the same instant, this does not seem practically to be any disadvantage—on the other hand, I consider it is the only true method of delineating, with precision, small objects in motion, although that motion may not be strictly coincident in time with others at some distance. Upon the whole I consider Mr. England's plan to be theoretically the best yet brought before the public for the purpose of instantaneous photography, and, from the extraordinarily successful specimens we have already seen, we may expect the same contrivance, or some modification of it, to be more generally adopted.

I cannot conclude without expressing my obligations to Mr. Ross, Mr. Dallmeyer, and Messrs. Horne and Thornthwaite, opticians, and to Mr. England and Mr. Latham, for their kind assistance in enabling me to lay before you this interesting collection of instantaneous shutters.

A NEW RAPID DRY PROCESS.

By Alfred Keene.

As rapid dry photography is just now occupying much attention, and everything relating to it is viewed with considerable interest, I have much pleasure in sending you the earliest particulars of a modification that I find *more sensitive*, and more nearly approaching wet collodion both in *sensitiveness* and *general character*, than any yet published. Though there is nothing new in the materials used, the particular manner of using them is, I think, quite *new*, and *opposed in principle* to the generally-entertained opinion of the *necessity* for thoroughly removing the free nitrate of silver when tannin or gum is used as a preservative. I have been very closely engaged on this subject lately, and a brief account of my proceedings previous to arriving at this modification may not be uninteresting before describing it.

Upon the appearance of Mr. Sutton's paper on gum as a preservative in connexion with a strongly bromo-iodised collodion, I tried it under the conditions indicated; and, though struck with the many good qualities it possessed, I did not find it so sensitive as described, nor so full of half-tone as could be desired.

The *sensitiveness* I increased fully twenty per cent. by washing off the preservative (gum) solution instead of allowing it to remain on as directed: increased sensitiveness by the same means I found to hold good with all the various preservatives subsequently tried. I then ascertained that sensitiveness was not further influenced either way by excess of *(over a thorough)* washing either before or after applying the preservative—a stream of water from a tap, falling upon one point only, producing no perceptible effect. A solution of bromine and also iodine were next separately applied to the washed plates, and washed off previously to adding the preservative, so as perfectly to remove all trace of free nitrate and convert it into a bromide or iodide of silver. The former reduced the sensitiveness more or less whatever preservative was used, but only very slightly with some; whereas iodine materially reduced, and in one or two instances all but entirely destroyed, it. Finding no advantage, either as regards sensitiveness or freedom from tendency to stain under a forced development, from the above, I tried first of all *less* washing of the preservative without advantage, and finally of the *sensitised film*. The *increase of sensitiveness* in the latter case was very marked, and encouraged me to proceed further in the same direction.

I then prepared a batch of plates—part of them on the same

principle I introduced for the Fothergill process, commonly known as the four-drachm washing, viz., the use of one drachm only of distilled water to every five superficial inches of sensitised surface, poured on and off till all greasiness is removed and even dilution ensured, when the preservative is to be applied and subsequently well washed off—and part *by applying the preservative direct to the sensitised surface without previous washing of any kind,* and finally well washing it off.

I have just completed developing these, and find the sensitiveness to have increased in proportion to the *decrease* of dilution of the bath (silver) solution on the surface, the maximum being obtained when the preservative is applied direct to the sensitised plate, the surplus being subsequently removed by a thorough washing without, as far as I can perceive, the *slightest* increased tendency to stain or fog, but rather the reverse, the more concentrated solution plates being remarkably free in this respect.

The following is a list of the different preservatives tried:—Milk, milk and tannin, albumen (plain) and tannin, prepared albumen and tannin, gum, honey and tannin, glycerine and tannin, and gum and tannin; also collodion containing jalap resin, as recommended by Mr. Maxwell Lyte, without any preservative. The most sensitive and best plates have been invariably those prepared with the tannin and gum; and, in my experiments with the free nitrate of silver, I have confined myself to it, tannin and honey, and plain gum.

Collodions have been tried prepared with different kinds of pyroxyline and proportions of the bromide and iodide salts, varying from one of bromide to four of iodide to *two* of bromide to *one* of iodide. That *containing equivalent proportions* with my *dry process normal collodion* has answered best.

Baths.—Thirty-five grains of silver per ounce, *neutral* (nearly so, containing *one* drop of glacial acetic acid in *twenty* ounces), and *acid,* with nitric acid in the proportion of *one* drop and *five* drops to twenty ounces. The *neutral* bath I preferred decidedly.

Having given these preliminary particulars, I will now proceed to describe the process:—

Collodion.—Extra bromo-iodised dry process, containing equivalent proportions of the bromo-iodide salts.

Bath.—Neutral, containing thirty-five grains of nitrate of silver per ounce.

Preservative Solution.—Equal parts of a filtered fifteen-grain-per-ounce solution of tannin and mucilage or gum water, made with four ounces of picked gum arabic, dissolved in eight ounces of filtered rain water, or distilled.

Developer.—The excellent one introduced by Major Russell, as follows:—

No. 1. Pyrogallic acid (English make), ninety-six grains; alcohol, with a little ether added, one ounce.

No. 2. Nitrate of silver, ten grains; citric acid, ten, twenty, or thirty grains; distilled water, one ounce. Add to each drachm of distilled water six or eight drops of No. 1, and three or four of No. 2, when required for use; or a two-grain-per-ounce pyrogallic developer, with one grain of citric and ten minims of glacial acetic acid, may be substituted, adding a few drops of a fifteen-grain solution of silver to each drachm when used.

Sensitise the plate in the usual way, except allowing it to remain at least *half as long again in the bath* as with ordinary collodion (the conversion of the bromide salts into the silver compound being slower than that of the iodide); drain for a second or two; apply the preservative solution rather liberally, commencing at one corner and allowing it to proceed to the second, third, and off at the fourth, carrying with it the surplus bath; drain rather closely; apply a second or even third quantity in the same manner, passing it several times well round the plate. The last lot will do for the first of the next plate, but should not be mixed with the stock. Drain, pour on a little water, and work it about till mixed with the preservative on the surface, to facilitate even and complete removal with the subsequent washing—(lukewarm water answers best with the present low temperature)—then well wash with soft water under a tap, in dishes or in any convenient manner, and place the plate to drain and dry, face inwards, on blotting or filtering paper upon, and leaning against, glass. Change the paper after about ten minutes for a fresh piece.

Expose about the same time as for wet collodion and pyrogallic developer, or, if anything, a trifle longer. Soak a few minutes in soft or distilled water, and develop in the ordinary way with the solution before described—changing it should it become discoloured before sufficient intensity has been obtained, which will be the case when a short exposure is given and development has to be forced.

Fix with hypo. (by preference) or cyanide.

I have not tested the keeping qualities of plates thus prepared; but, from the clean manner in which they develop and the amount of forcing they will bear without any material deposition, the result argues, I think, very favourably for them in this respect. Nor have I tried the ammonia and pyrogallic development lately recommended by Major Russell—and previously by another correspondent in one of the photographic publications—for tannin plates, which probably may have the same accelerating effect on these, and thus still further lessen the necessary exposure; though I should look for the ammonia in conjunction with pyrogallic to have a great tendency in all cases to produce fog, from its possessing the power of decomposing both iodide and bromide of silver, even in the dark.

The appearance of the negative, as far as my present experience goes, is very favourable indeed; the impressed image appearing well in the film, and full of detail—more approaching an iron-developed one in this particular.

It is somewhat singular that tannin and gum combined should give more sensitiveness than either separately; but such has invariably been the case, and may probably be attributable to the *gum increasing the density of the solution,* and thus causing the tannin to penetrate more completely the porous cells of the collodion.

It has hitherto been a maxim that when gum or tannin are used as preservatives all free nitrate of silver must be previously removed; but I think I very clearly show by this modification such an opinion to be fallacious, and that the free nitrate is not only *not* injurious, but may be advantageously retained. This at once occurred to me as probable when I saw the result of my first experiments in this direction; for, unlike albumen, gum and tannin are not coagulated, but remain perfectly liquid and, to appearance, unchanged, and all surplus is consequently easily removed by washing.

I find that I have omitted stating that I give the preference, at present, to a substratum of India-rubber dissolved in benzole, as recommended by Mr. Sutton; but I shall be glad to find an equally good substitute, as it is difficult to get it quite clear, being as tedious to filter as collodion. I have tried plates coated a second time with preservative, allowing it to remain after previously washing the first application off; but I do not find any gain, but rather loss, of sensitiveness—though, for keeping, this plan might prove advantageous, by shutting up the sensitive compounds from direct contact with the atmosphere.

FURTHER NOTES ON THE ACARI FOUND IN THE NITRATE OF SILVER BATH.

By R. L. Maddox, M.D.

In a letter dated 28th October I acknowledged the receipt of the tube with *Acari* from Mr. Sterry: may I ask the favour of your publishing the following, should it not too much intrude on your space:—

When the *Acari* found on the 12th April were examined, and many of them mounted on the Monday following, two taken from the tube with water were placed in a clean five-inch test-tube with filtered rain water and a little of the nitrate bath solution, about one and a-half drachms in all, then closely corked and set aside. Circumstances and various engagements led me, on mounting the remainder, to overlook these specimens. When Mr. Sterry's letter appeared in your Journal I made search for the tube, and not being able to put my hand on it, concluded that, from being often in want of one for boiling or preparing various microscopic objects, I must have regarded the liquid as water or nothing of consequence, and so have employed the tube for other purposes, consequently there was no further notice taken of the matter.

When setting my room in order for the winter, on October 31st, clearing away lots of accumulations, and wiping a number of tubes and small bottles, my notice was attracted to one having the appearance of being mildewed on the upper part, and containing a little liquid with a grey deposit, so resembling the grey deposit from nitrate of silver that I at once more closely examined the same, using a good lens: this directly led to the recognition of the missing tube. On the surface, and in the liquid, I counted twenty-one *Acari,* many of them having the appearance of the *Acari* previously described: on the sides of the tube, even to near the cork, numbers of small ones were seen, and upwards of fifty in all counted.

Desirous of having the testimony of others, my son, who was near at hand, was told to take the lens, examine the tube at a window, and state what he saw. "Insects covered with hairs, just like those you've photographed," was his ready reply. I then

took the tube and lens down stairs, and my wife was asked to examine the tube, and she stated, without being aware of my son's answer, that "they were insects looking like those found in the bath." My daughter was then applied to. She had some doubt about describing what she saw; but when asked if she had seen any things like these, she replied she had seen some photographs like the things there. I then carefully sought for some signs of life, for all appeared motionless. The tongue was applied to the outside of the tube where two or three rested, apparently standing on their legs; still nothing of moment was perceptible. Having other things to attend to, the tube was set back in its place—an old test-rack—not having been uncorked.

It was not until the afternoon of the 5th November that the examination was continued, thus:—The cork was removed and the *Acari* washed out into a clean beaker. Some of the larger ones were taken out by a fine sable pencil, placed on a slide with water, and covered by a thin glass cover. They appeared dead. There was one fine *Acarus*, with four large and very distinct ova inside. The cover was carefully lifted, and this insect was at once placed in a small clean tube, with a little boiled filtered rain water, corked and set apart. Three were left on the slide to be mounted. Two others were then taken out: these had only six legs, and I fancied fewer and finer hairs. Two of the smallest were then removed and examined under a one-fifth Smith, Beck and Beck's object-glass, no cover being used. There was unmistakeable evidence of life, the insects struggling and spreading out their tiny limbs. One had only four distinct legs that I could see, the other six, and hairs very few. Desirous to have other testimony as to their being alive, I called my children to come and see them, at the same time asking them if they saw the insects moving, to which both immediately replied in the affirmative. My wife was unfortunately engaged with a visitor, or I would also have added her evidence. I then watched them, supplying from time to time a droplet of water, until darkness, from a dense fog, putting a stop to further examination, the slide was placed on the table, and a lamp was lighted, purposing to continue the observation, which I now exceedingly regret, as I attribute to this and my own carelessness the misfortunes that have occurred. Having carefully trimmed the small lamp, and proceeding to arrange the mirror, my sleeve caught the beaker, which had been left close to the edge of the table, knocked it down, and I thus lost the contents. My troubles did not end there, for in my flurry I placed my hand on the slide with the live specimens, and so lost them. I had fully intended to mount these at once in the glycerine jelly. Out of the eight examined, five were then mounted in that medium, and I herewith forward for your acceptance three of the specimens on one slide, and one on another. One, as you will see, has been crushed to try and separate the mandibles, but without success; the others are satisfactory. Ova will be noticed in one. In the tube were some irregular granular crystals, extending from the edge of the liquid to about a line beneath.

Now, of the specimens supplied by Mr. Sterry, a friend to whom I sent some, writes that the tube arrived safely, and he is much gratified at the opportunity afforded to examine them alive. He regards the species as being the same as from the bath. The six I kept for observation were treated thus:—Oct. 28. A clean, wide-mouthed tube and a smaller one were prepared: round the neck of the latter was tied a little clean cotton thread, and a few drops of the nitrate bath were placed in it. The six *Acari* were then carefully removed into the large tube, the small one lifted into it by the thread, and a strip of clean unused sole or harness leather inserted by its side. The top of the wide tube being then covered over with clean Swedish blotting-paper, tied with thread as tight as it could be drawn without risk of breaking, this tube was set aside in my dark cupboard. When examined in the evening, four of the specimens could be seen alive: when re-examined Oct. 31st, only two could be seen—one alive, the other apparently had been crushed by the bottom of the small tube rolling round on the other. Fearing to injure the other insect, the tube was carefully replaced on the shelf: the paper cover was not removed to seek for the other four. More of this at a future examination, if there prove any result worth recording.

A word or two on the tube containing the female with the four ova. On the mirror I could distinctly see three objects on the surface of the fluid (water), besides the insect which hung head downwards. It was not until the afternoon of Nov. 8th that I was enabled to seek after these ova. The tube was first examined by a lens, but without success. I could not detect the ova with certainty. A scrupulously clean watch-glass was then taken, and the fluid poured out into it. At once the female was removed to a slide with a little water. I then found only one ovum attached to the body by some surrounding granular matter, in two bands. Careful watching led me to suppose I could detect some molecular movement near the edge of the case, which was much lighter on the one side than on the other; in fact, as though it contained an opaque body, filling all but one part or side of the long ellipse. The insect was then carefully removed to a *clean* glass cell, containing a little boiled filtered rain water, and I proceeded to seek for some of the ova in the watch-glass, but with no more success than obtaining what appeared to me the broken case of one. The tube was then washed down with a little more water, and, after a most patient examination, I was enabled to remove from the surface of the liquid a young *Acarus*, which I immediately mounted on the slide. It did not reveal to me any distinct signs of life. That I could positively assert; for unfortunately I dared not try to alter its position by the pencil, for fear of losing it. When this was mounted, and after a hasty meal, I at once looked after the insect and ovum in the cell. The ovum was free on the surface of the water. It was directly removed to a clean slide, and there I had the satisfaction of seeing the young creature alive, and of showing it to my wife, who happened to come into the room at the moment. Ere the droplet of water was evaporated, I mounted that specimen also, and herewith have the infinite gratification of forwarding them to you. Nothing but patience, as you will perceive by their respective sizes, could have afforded any hope of this final success. It is curious that there is not a more perfect resemblance in the two: the more larval-looking one corresponds with the two live ones shown, as stated, to my children.

Having now attempted, distinctly and clearly I hope, to state matters, I forbear offering any opinion of my own, fully aware that "every investigation, every discovery shows us rather how much remains concealed than how much has been detected."

What do we know of the circulation, respiration, or nutrition of the *Acari?* Lately I have been watching those found on extracts of aconite, seen busy amongst the mildew on the surface, yet it is very doubtful what may be their food. They appear to wander amid the threads or mycelium, apparently in search of something—were we to state what, confidence in the affirmative or negative would directly fall into "the comparison of mere probabilities."

I now thank Mr. Sterry for his specimens, and greatly regret that your correspondent should have so far thrown the "life history" over to myself, "even though we should have done nothing more than advance into sunshine and an open path, with a long journey of discovery before us." But, perhaps, he has preferred to bear in memory the following passage, from an old moralist:—"*Quid te torques et maceras in ea questione, quam subtilius est contempsisse, quam solvere.*" With all due apology for the length of this communication, I herewith close—at least for the present.

HOW TO TINT PHOTOGRAPHIC TRANSPARENCIES FOR THE MAGIC LANTERN.

By An Old Hand.

Photographs, if properly prepared for the purpose, are well adapted for exhibiting in the phantasmagoria or magic lantern, and might be extensively used educationally by lecturers and teachers, as they give accurate and correct representations of remarkable places, antiquarian remains, objects of natural history; and also for illustrations in botany, geology, and mechanism.

Many of the photographic subjects can be much improved and the effect heightened by careful and judicious colouring. Pigments are now prepared so finely ground and so transparent as to materially facilitate the operation of giving the necessary brilliancy to the photographic foundation.

Be certain that the impression is on a piece of glass, clear and transparent, without specks, scratches, or flaws, as much depends on this for success, even more than is generally supposed—some qualities of glass having a foggy character that no cleaning or polishing can remove. To get a bright, distinct picture on this sort is simply impossible. There is a thin crown-glass made in Bristol more transparent and free from defects than any usually met with, the only objection being that it is very thin, and liable to break, so that extra care must be taken in its use. It would be as well to try all subjects on the screen, and if found clear and sharp they are fit for tinting: if the reverse, reject them, with the exception of some peculiar subject here and there—as an old abbey or ruin—which may answer very well to work up into a moonlight effect.

Having obtained the desired subject on a clear, clean plate of glass, it is next necessary to have a piece of fir, one inch thick, a foot in breadth, and a foot and a-half long. In the centre an aper-

ture must be cut, the size of the glasses to be tinted, with an eighth-of-an-inch rebate all round, to prevent the plate falling through. This is to be supported from the back by two hinged legs, like those of a nitrate of silver bath, or rested on two thick books, so as to allow the light to shine through and enable the operator to see distinctly where to lay the tints. Frames for the purpose can be purchased, ready made, for five or six shillings; but any one can prepare the board we have described, which will answer the end desired, for about one shilling. There are in the photographic and fine-art apparatus market many *cheap* articles that are *dear* at a gift, and many very necessary ones that are preposterously expensive. There is much want of a photographic "Joe Hume." The centre of the board could, with little trouble and ingenuity, be made to receive some frames like the dark slide of a camera, and support several sizes of glass plates.

We now come to the tinting and the necessary materials, which should be really good to give satisfactory results. Inferior and badly-prepared colours will only yield a series of smudges, and will dry so dead and heavy that no amount of light will bring them out with clearness on the screen.

There are two methods of using the required colours, which we shall describe—the one as water, the other as oil-colours. They each have peculiar and distinct advantages in the hands of experienced operators; but, as the water-colour is the more simple and easier of manipulation, we will proceed to describe it first, presuming that, in addition to the deal-board or desk with the centre aperture previously mentioned, the following articles are also ready, viz., a cake or tube of yellow, brown, green, crimson, black, blue, and burnt sienna; a bottle of liquid ox gall; some mastic varnish; a bottle of prepared water-colour varnish; and some sable brushes.

A varnish may be made by dissolving a small portion of Canada balsam in turpentine. Let it remain for a couple of days to settle; then pour off the upper part of the mixture into another bottle for use. But the most certain way of proceeding is to procure the required varnish from an artist's colourman, as, being made in large quantities, it gets clear of sediment and impurities; while the action of filtering a small bottle and small quantity will most probably disturb the sediment at the bottom, and render the article unfit for use.

The colours mentioned can be procured specially prepared for the purpose in oil or water—the oil colours in tubes, the water colours in tubes or cakes—ground particularly fine, and very transparent. They should be mixed together, so as to give the tints required: thus crimson may be worked up to scarlet by the addition of yellow; purples by mixing the crimson with blue, graduating away to any depth by the use of more or less blue; warm yellows and orange tones by the addition of burnt sienna; greens may be made intense or light by more or less yellow. Opaque black, or the liquid jet black, is only of use when portions of the transparency are required to be stopped out. The brushes should be good sables.

The subject on the glass having been cleanly varnished, mix any of the required water-colours on a slab or on the back of a plate; run a very weak wash of diluted ox-gall over the whole picture, to clear away all grease. It will be dry in a few minutes, when the brush should be well filled with the required tint, then *evenly* and expeditiously applied. On this much of the success depends, as laying on the tint in one uniform flow or wash will give a clearness and transparency that no wavy or faltering application can attain. When all the parts are put in with the first coat or wash, and the glass quite dry, float over another application of varnish, or lay it on thinly and evenly with a large sable or flat brush, and rest the plate up on end to dry, taking every precaution against dust. This is a most necessary precaution, and must be strictly attended to. The process ought, in fact, to be carried out in a place prepared expressly for the purpose: it is as necessary for this operation as the dark-room is for another. We know a very successful artist who has a small room arranged for the purpose, with an oil cloth on the floor, which, with the surface of the room, is rubbed over with a half-dry cloth an hour or so before he is going to use the place; and, when all the loose dust that is not to be caught has settled, he goes in to his work, fastens the door, and is for some hours, or the whole day, according to the nature and amount of his work, "*not at home.*" By this means his pictures are invariably clear and bright. We will now suppose the varnished plate dry, and the second coat of tinting and strengthening when needed may be proceeded with and the clouds touched-in. If the sky has been tolerably defined in the photograph let it remain, tinting, but slightly, from the top, or upwards from the horizon, or only touching the dark masses; but, if the sky be a blank, the cloud forms can only be introduced with success by one accustomed to the work: any other had better be content with graduating a tint upwards or downwards, which, if not very artistic or striking, will not be objectionable, and will in no way interfere with the other parts of the picture. As soon as this second painting-in is dry, proceed with the varnishing as before described, which, when hard, will be ready for the third coat or finishing. This will comprise strengthening the foreground objects, and marking any peculiar point or feature with firmness and precision. Positive lights may be scraped out with the point or etching needle, and a few effective touches given to the most prominent and nearest objects. When dry, the subject should be protected from injury by another piece of glass, of the same size, fastened over it in the following way:—Cut a narrow "mat" out of cartridge-paper, and gum it down securely on the flat edge of the painted glass. When it has dried down firm and even, give it a coat of Canada balsam, and press down upon it the piece of glass that is to cover and protect the painted surface. When dry and set, the edges can be bound round with paper, or inserted in the wooden frames to be had for the purpose from the opticians.

We shall defer detailing the method of manipulating with oil-colours till another occasion.

Bits of Chat.

BACKGROUNDS:—THEIR ABUSE, THEIR USE, THEIR PRINCIPLES, AND THE MODES OF PAINTING THEM.

Bold and earnest as I have felt in advocating the claims of photography as a fine art, and proudly as I have pointed out illustrative proofs of such claims in the best works of our real artist-photographers, I have always been conscious of the great mass of evidence supplied to the other side by the bad taste and artistic ignorance of photographers belonging to "a certain class." When these photographers confined their ambition to the representation of a chance-posed model sitting by a modern table, in an ancient chair, before a plain background, their artistic shortcomings were not so strikingly palpable; but now, when their ill-timed ambition induces them to break forth into a dangerous irruption of pictorial composition, and they attempt to crowd into their glass-rooms and photographs pillars, balconies, rocks, ruins, staircases, terrace-steps, &c., with landscape, architectural, and other painted scenery to back them, the results are too generally of the most glaringly discordant nature, and the ridicule and sarcasm of the art's worst opponents seem justified by the presumptuous ignorance of the art's most numerous class of professors.

If there is one fact more loud than another in expressing the absence of artistic culture among the great mass of photographers, it is the abuse of such things as enter into the composition of the incongruous materials composing many of the backgrounds used in photographic portraiture. We continually meet blunders of the most extravagant character in the combinations of inharmonious accessories forming such backgrounds. To see stone balconies and pedestals built up in drawing-rooms on handsome carpets, is one of the most frequent of these blunders, and one which has often been ridiculed, while drawing-room chairs in mountain glens, and clumsy stone-like pedestals in the middle of apartments displaying a crowded quantity of elegant furniture, and similar enormities, are almost as common. But these are such simple crimes against common sense that even the least observant may easily detect them. Apart from such comical arrangements, however, there are other evils, which, although very readily *felt*, are not so readily *seen*, by the uncritical eye. For instance, accessories which are out of keeping with the tone of your work, or which present harsh masses of staring white in direct opposition to strong black cast-shadows, are as offensive to the eye pictorially educated as an out-of-place, inharmonious passage in music is to the ear of a musician.

But we must not be misled and carried into extremes in denouncing these incongruities, as so many have been of late, by the sarcastic witticisms of unimaginative critics, who are more prone to mock what is not at once apparent to their indolent minds than to try and understand it. Thus sundry funny dogs, who have seen drapery associated with out-door scenes in our photographs, have made ironical inquiries after that portion of the sky from which such drapery might be naturally supposed to hang; and good, simple folks have chuckled and laughed to read such fun, neither critic nor readers ever contemplating for one moment the not *very* extravagant probability of seeing a scene through an open window with its curtain drawn aside. So it is with the draped pillar and

pedestal which is so common in the works of our greatest portrait painters. Notwithstanding the happy power which the rounded lines of the plain or fluted column, and the angular ones of the massive base, have of contrasting and composing with the flowing curves of the looped and falling curtain—notwithstanding the admirable way in which the column's retiring surface is expressed by softly-graduating half-tones, contrasting so well the abrupt change from light to dark in the angular pedestal—notwithstanding the graceful dignity of its proportions, when architecturally correct—notwithstanding, in short, the little world of variety, beauty, and expression which such accessories, well chosen and arranged, may originate, we are to put them scornfully aside at the bidding of some petty critics, presumptuously mocking what they never understood, because, like the moon and stars, the earth, and all that in it is, they are "old and hackneyed."

But the greatest abuse of background accessories is to be found when they are transformed into those unmitigated shams—those undisguised, honest falsehoods named "profile," from which all lovers of art must turn with abhorrence. In vain you place your sitter's hand upon the sharp edge of the painted balcony, or rest his or her arm uncomfortably on the wooden edge of the profile pedestal: the attempt is laughed to scorn by the loudly-contradicting cast shadows which fall upon a surface unmistakeably perpendicular and flat. Every shadow which falls upon the profile accessory only serves to chronicle its flatness; and every attempt to insinuate the contrary, by using it as if it were solid, serves to make the falsehood more unreal and palpable than ever. Some reform has been effected in this way by one of the manufacturers of these things; but I beseech you to "reform it altogether," and let the things go back to those theatrical painting-rooms from which it must be hoped they never had emerged. If, as has been urged, popularity may be received as a proof of merit, I must undoubtedly be wrong in denouncing such things, for popular they unfortunately are; still, I think I have heard of other popular things (crinoline to wit) which have, nevertheless, been pretty generally admitted evils, and so I shall continue in the belief I have just expressed. I admit their portability to be a certain kind of virtue, if things so vicious may be said to possess a virtue; and I know that photographers of the class already referred to think it no small advantage to have an equality of sharpness and distinctness distributed equally over all surfaces, whether intended to appear near or remote. I am also prepared to make another admission which may go in favour of using profile accessories with some folk, which is that more than half-a-dozen photographers of my acquaintance—*artists by profession and education*—use these profile accessories, and are by no means inclined to give them up, although they freely acknowledge that, "*of course*," they would not tolerate in a painting or drawing the comical blunders which the use of these originate in their photographs. The objections to be urged against the use of profile accessories are many and serious; but they are so palpable that I feel almost ashamed to continue pointing them out. Real accessories change their appearance *palpably* with every alteration in the position of the camera, and with every change in the character and direction of the light; but the stupid profile remains obstinately and ridiculously the same under every varying condition, whether of light or point of view. The lights and shades of real accessories are in harmony with those of the model—being strong or weak, diffused or well-defined, according to the disposition or nature of the illuminating agency: those of the painted profile, on the other hand, generally contradict flatly the light and shade of the model. Again: the position of the figure may indicate that it is viewed from the *left*, while the accessory may indicate that it is viewed from the *right*, unless, as is scarcely to be expected, you sacrifice the sitter to the accessory, and take every face in precisely the same position, in order that it may be in keeping or harmony with the background. My able scientific friend, Mr. Highley, thinks the effect of such things "is very good, *if* accessories are deemed desirable by the person photographed;" but I cannot think because the person photographed desires a picture as well as a portrait, that, therefore, the photographer is justified in supplying such lame apologies for real accessories as these certainly constitute. Of course, as Mr. Highley states, the false are *cheaper* than the real articles; but this is no more sufficient as a reason for using them than cheapness in a bad lens giving untrue, distorted images is a reason for preferring such to a good lens giving an image truthfully perfect in its outlines and proportions.

I fear the great body of portrait photographers—although angry that the Exhibition Commissioners should classify their art with the meanest description of human industry, and evincing in their establishments and mode of conducting business every desire to be treated rather as artists than mechanics—are not aware of the importance of advancing something more than mere assertion in support of their claims. By all means let us have our portrait photographs as much like pictures as picturesque accessories judiciously chosen and artistically grouped can make them; but let one light give tone and unity to the whole; one point of view govern the perspective of model, of background, and of accessories. If this is not the case, our works become contemptible as pictures, and can only rank with those productions which are due to the simple action of easily-managed tools, calling neither for the commonest display of intellectual exertion nor intellectual education. If the photographer persist in using profile accessories, he should have sufficient knowledge of light, shade, and perspective, as elements of drawing, to desire so to use them that at least some of the more glaring errors of their combinations may be avoided. He can, of course, have them painted with due reference to the light of his glass-room, its direction, or arrangement, character, &c., and, in changing the position of his camera to right or left, he can also change his accessory for one having the lines vanishing and surfaces changing in a direction which harmonises with the corresponding changes made in the point of view, but then the photographer must also be, in something more than mere name, an artist; still even when so used they must, from reasons into which I have already entered, be vastly inferior to real accessories.

In denouncing thus strongly this abuse of pictorial backgrounds, I do so solely in the interests of photography as an art. To gain recognition for our art among those who are jealous of its influence, fearful of its growing power, and prejudiced against its most important claims, its guardians must jealously and zealously fight against those who would degrade it, whether they be Royal Commissioners or ignorant critics, mistaken friends or malicious foes—whether they be fierce enemies without, or friendly enemies within, the camp. Such apostles of the True as Rejlander and Robinson represent will assuredly fight the battle of our art in vain if we send forth our thousands of ludicruously inartistic card-pictures to plead against them in nearly every shop window and from nearly every drawing-room table throughout Europe. In this article I consider myself as a kind of recruiting-sergeant, beating up for recruits to serve in the army of Generals Robinson and Rejlander and their equally respected compeers. If you, my dear reader—you, individually—strive to raise the character of your photographs as works of art, you aid in raising the art itself in the esteem of those who will, by-and-by, assuredly give it and its professors their permanent place in the esteem of the public. On the contrary, if you only work to serve some present lowly purpose—some pettily ambitious, selfish aim—you may be equally sure that no art can be degraded without its professors speedily suffering where such professors will most feel it, namely, in their pockets. The higher the standard of perfection in any branch of human industry the fewer are those who attain to it, and, consequently, the more costly and profitable does their labour become. The lower that standard the more numerous are those who touch it, and, with an excess of labourers, labour becomes cheap and the labourer poor. This is but a mean motive to urge, it is true; but there are those who will appreciate such more readily than loftier incentives.

I would fain not close this article without speaking of the use as well as the abuse of these accessories; but time and space forbid, and I must be content by adding, as last words, the usual—"*To be continued.*"

A. H. W.

International Exhibition.

THE PHOTOGRAPHIC APPARATUS AND APPLIANCES.*

By Samuel Highley, F.G.S., F.C.S., &c.

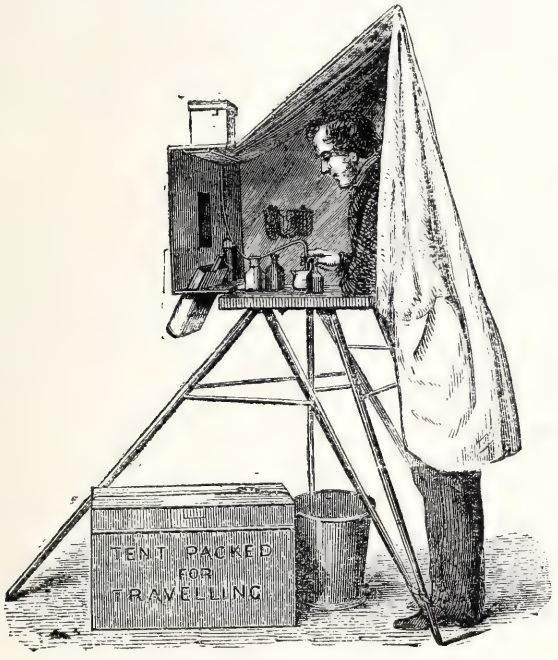
Messrs. Negretti and Zambra's most important contributions were their well-known, extensive, and beautiful series of transparent stereoscopic slides of views at home and abroad, together with first-class stereoscopes. Among their photographic apparatus we noticed some well-constructed cameras, but nothing of novelty to call for special notice. They likewise exhibited some *carte-de-visite* albums, very handsomely bound and got up.

Mr. T. W. Richardson exhibited a camera for astronomical purposes, in which specula were employed in place of refracting lenses, one arrangement being similar in principle to a Gregorian and the other to a Cassegrainian reflecting telescope. The Gregorian

* Concluded from page 431.

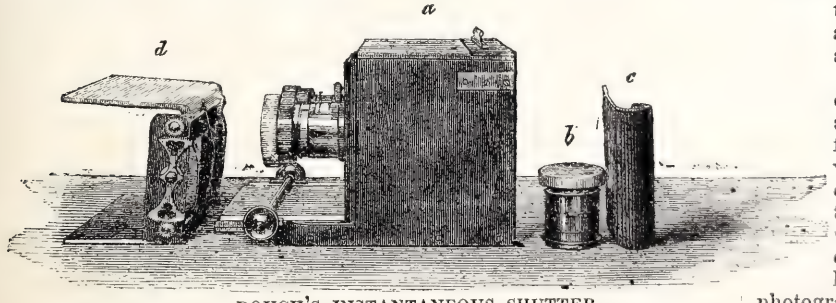
reflector was 4¾ inches in diameter (ground in a 11½-inch radius), having a focus of 5¼ inches, nearly; the Cassegrainian reflector was of the same diameter, but ground in 18 inches radius from a point.

Mr. ROUCH exhibited a remarkably fine collection of cameras, lenses, and appliances. The cameras were constructed for the operating rooms, for large landscapes, for stereographs, and for stereographs and landscapes combined. The support for the trunk camera was an operating-room stand of great solidity, on the Archimedean screw principle we have alluded to on a former occasion. We described Mr. Rouch's tent in an article contained in a previous volume of THE BRITISH JOURNAL OF PHOTOGRAPHY, but since that time he has made some important improvements in its construction, so that it may be regarded as a very perfect arrangement for the photographer, whether in the field or *en route;* for it packs up like a trunk when done with, and then contains all the chemicals and materials required by the operator. The annexed woodcut will give a general idea of its construction.



ROUCH'S PORTABLE TENT.

In this collection we noticed a very ingenious form of lens-shade for rapid exposures, wherein two flaps, instead of one (as in Dallmeyer's and Ross's shutters), were worked by a double-racked crank, so that by a turn of the hand in one direction *only*, the lens was exposed by the *upper* flap being raised, and closed by the under flap folding upwards, while both flaps formed a sun-shade during the time the lens was uncovered. It will be seen that such an action must be more rapid than when the hand has to be first turned upwards and then downwards.



ROUCH'S INSTANTANEOUS SHUTTER.

This collection also contained samples of Hardwich's pyroxyline, and a choice series of the chemical substances used in photography.

Mr. H. SIMPSON exhibited an expanding developing closet suitable for amateurs, within which all apparatus and appliances could be packed. When closed it had the appearance of a wardrobe; when opened it presented a dark chamber about four feet square, with windows for yellow and white light, sink, shelves, &c., arranged so that they could be adjusted to any height deemed most convenient to the operator—a ventilator not being omitted.

Mr. SOLOMON exhibited a great number of the minor appliances required by the professional and amateur photographer. Among these we may specify a very convenient turn-table, to be used in conjunction with the "glass shapes" now in vogue for cutting and trimming photographs for mounting; porcelain slipper-shaped dishes for developing negatives in; yellow lamp glasses and globes; a new material for backgrounds; glass and porcelain baths and dippers; polishing liquid; and many other useful materials. We also noticed a very ingenious ∧ shaped slot arrangement for the adjustment of the lenses in a binocular camera, and the model of a tent: of the latter we could form no judgment as to its capabilities, as it was in a paralysed condition when it came under our notice, through a portion of skylight having fallen upon it (a weakness the roof was given to), so that its aspect reminded one forcibly of "Shallaballa" after friend *Punch* has knocked his head in.

Messrs. WHITING exhibited some portable cameras; but, though we applied for a description, we never obtained any information as to their peculiarities.

Mr. WILDING exhibited a universal eccentric camera, which we suppose was to be regarded as a novelty; but the very first camera we had made was exactly the same in construction, being copied from an instrument in the possession of Mr. Hennemann, and designed by the late Mr. Robert Murray. It was simply a plate for the support of the lens, sliding in dovetails on a circular plate capable of complete rotation, so that the lens could be raised or depressed, or moved to the right or the left, according to the position in which the rotating-plate was turned. A camera was also exhibited by Mr. Wilding, wherein the space between the lens and the plate could be exhausted, and then replaced with "an ozonised atmosphere," by which means "instantaneous pictures" were stated to be obtainable. We should like to see this idea "ventilated," for though we have applied for information we have not been favoured with any communication in reply; whenever this want of courtesy occurs, we generally find, as a rule, that "there is a screw loose" somewhere.

In concluding these notices of the photographic apparatus and appliances contributed to the International Exhibition, we have to thank the various exhibitors for their courtesy in affording us facilities for examining their goods in detail; and we can only regret that we have not had more "novelties" to record.

The booming bells have rung out the last visitor; they, in turn, have been pushed from the floor, and the great building lately teeming with life, thought, and the results of a world's industry, gradually resigns itself to an atmosphere of fog and dust, till such time as the shrill trumpet recalls it to a glorious resurrection.

ON PANORAMIC PHOTOGRAPHY.*

By THOMAS SUTTON, B.A.

IT is now some three or four years, unless my memory deceives me, since I had the pleasure of preparing a paper *On Photographic Lenses*, which was read before your Society. You will be glad to hear that I have continued my studies in the optics of photography, and have since that time invented a curious lens for taking panoramic views, the description of which will form the subject of this paper.

Through the kindness of Mr. Ross, I am able to exhibit to you one of these lenses, made by him, together with the camera and other apparatus connected with it, and also some panoramic negatives and prints taken by myself and other persons.

In the early days of photography upon paper, shortly after the discovery of the art by Mr. Fox Talbot, numerous persons who admired landscape drawing and painting, and had a taste for the fine arts, turned their attention to the new discovery, and endeavoured to work it out advantageously in the production of views of picturesque scenery and interesting places. But the capabilities of the new art for this purpose were soon found to lie within very narrow limits, chiefly on account of the imperfection of the common camera-obscura, which would only include an angular field of about 40°. The result has been that common photographic views have never satisfied the public, or had a remunerative sale. Commercial photography has resolved itself into taking stereoscopic pictures, and card-portraits. Those who have endeavoured to make the common photographic views pay even the travelling expenses involved in taking them, have generally been out of pocket and obliged to give it up; and only a few days since Mr. Roger Fenton's photographic stock of cameras and negatives were brought to the hammer. The photographic views of natural scenery and interesting places which have hitherto been taken have never had a remunerative sale, the chief reason being that the common camera-obscura does not include a sufficient width of angle to take a picture such as artists are accustomed to take. The very existence of landscape photography as a remunerative art depends upon the introduction of a lens and apparatus which will include an angular field of at least 80°,

* Read at a meeting of the Historic Society of Lancashire and Cheshire, Nov. 20th, 1862.

with as good definition at the extreme edges as in the centre. The instrument which I have now the pleasure of submitting to your notice satisfies this important condition. It will include 90°, not only in width but in height, and all other directions. The only reason why you see the negatives which I exhibit restricted to about 50° in height, is because I cannot find any glass manufacturer in England who will supply me with spherical bowls of the right radius upon which to take my negatives. I am, therefore, compelled to work upon cylindrical glasses such as you see. If it were possible to procure suitable spherical bowls for the negatives, the positive could be printed upon white silk, and exhibited to great advantage in a panoramic diaphanoscope. Let us hope that the good time may arrive when some enterprising glass manufacturer, like my worthy friend who is reading this paper, will succeed in making these terrible glass bowls for the poor photographers. At present Messrs. Chance shake their heads and pronounce it an impossibility, and a leading London optician refers me to a continental firm to get the thing done. You will, perhaps, say why are you obliged to work upon a curved surface, and why cannot you work upon a flat plate? The answer is, first, that no possible lens that can be made will give a picture including 90° upon a flat plate with equally good definition at the centre and margin, and free from distortion; and, secondly, that if such a lens *could* be made, the objects at the sides of the picture would be represented hideously out of shape and proportion, and would look as things do when we view them askance out of the corner of the eye, and not as they do when we direct the axis of the eye towards them.

The importance of being able to include in a photographic view the same angular extent of subject that an artist commonly includes in his pictures was perceived at the very outset by the artists who endeavoured to turn photography to account; and from the very first we find artist-photographers endeavouring, by all sorts of means, to conquer the existing difficulty in the common camera, of the small included angle. Panoramic cameras, in which the pictures were taken upon a curved Daguerreotype plate, by means of a revolving tube which carried a common lens, and had a long, open, vertical slit close to the sensitive plate, date almost as far back as the discovery of photography, and the failure of this apparatus must have damped the ardour of those who at first hoped great things from it. It is obvious, with this camera, each separate vertical slip of the series composing the picture must require nearly as long an exposure as the entire picture would if taken with a fixed lens; and since the picture, in order to be sharp and distinct, must be composed of a vast number of these vertical slips, the exposure of the whole by the revolving tube requires to be very much longer than that of a common picture taken at one operation with the same lens in a fixed position. Then again, in a picture composed in this way of slips the sides of which overlap each other as the revolving tube moves on, there cannot be the same perfection of definition as in a panoramic picture, taken with a fixed lens; added to which the motion of a mechanical contrivance with the camera must, of necessity, produce vibration, which injures the definition. Thus it has happened that the greatly-increased time of exposure, and the inferiority of the definition produced by the successive overlapping of the edges of the several narrow slips of which the picture is composed, as well as the inevitable vibration of the camera, have proved such serious evils that this mode of taking pictures has been abandoned as incapable of producing first-rate results.

But it is enough briefly to allude to these attempts as illustrative of the importance of the problem to be solved. It is enough that they have failed from the causes assigned. I will now endeavour to decide the means by which I have succeeded in overcoming all the difficulties, and in producing a lens which will take a picture including ninety degrees, or more, at one operation, and without any moveable mechanism within the camera, so that the definition is as good at the ends as in the centre, and the time of exposure of the entire view not longer than would be required with any common view lens with the same sized stop for taking a picture of only one-third the extent.

The panoramic lens consists of a spherical shell of flint glass, having an internal cavity filled with water, and fitted with a central diaphragm of peculiar form for equalising the illumination, the whole being mounted in a circular zone of brass. You will understand its construction at once by examining the lens itself, much better than by listening to a verbal description. On taking it to pieces and looking through either of the flint lenses, the surfaces of which are concentric, you will perceive that they are diminishing glasses, while the sphere of water which fills the inner cavity is a double convex lens with high magnifying power. Therefore the diminishing lenses, being made of a material which has a *high* refractive and dispersive power, and the convex-lens being composed of water, which has a low refractive and dispersive power, you are enabled, by assigning a suitable radius to the internal cavity, to render the compound achromatic, and fortunately, as it turns out, also greatly to increase what would be the focal length of the sphere if made entirely either of glass or water.

All the pencils from distant objects which pass through this lens pass through its *centre*, and are incident at right angles upon its four surfaces; so that none of the defects due to oblique incidence exist in this lens—and it is the only lens of which this can with truth be said.

With respect to defining power, that is marvellously good, as the negatives testify. It happens that the particular internal radius of the shell, which gives absolute freedom from spherical aberration, very nearly coincides with that which renders the compound achromatic: so that, with a stop equal in diameter to the one-twentieth part of the focal length, the definition is faultless, as you will perceive on examining the specimens.

The camera and apparatus will be understood on inspection, and Mr. Forrest will be able kindly to explain all about them.

The manipulation of the curved glasses, and the mode of printing from them, involve no real difficulties. The three best negatives sent were taken by a pupil of mine, after a very few months' practice in photography; and they are as perfect as any negatives upon flat plates.

I will now conclude my paper with an exhortation to every landscape photographer present to try his hand at this mode of picture-taking, and I promise him such a fund of delight and satisfaction, as he has never yet derived from the practice of photography. In the hands of a true artist the panoramic lens is an instrument of great capabilities, and marvellous results may, I am sure, be obtained by it. I know of no objection to it, either theoretical or practical. Subjects in which long straight lines of architecture occur can be viewed in a suitable diaphanoscope or stereoscope; and landscape views can be mounted upon a flat cardboard in the ordinary way. Duplicate panoramic pictures can be taken simultaneously in a twin-lens camera, and viewed in a panoramic stereoscope. Two of the negatives now exhibited were taken simultaneously, in a camera of this sort.

New Books.

Chemistry. By William Thomas Brande, D.C.L., F.R.S., &c., &c., and Alfred Swaine Taylor, M.D., F.R.S., &c., &c.

London: John W. Davies, 54, Princes Street.

Brande's *Chemistry* has long enjoyed a deservedly high reputation, and Dr. Alfred Taylor's name in connexion with chemical jurisprudence is familiar in the mouths of many as "household words;" consequently an edition of the well-known work by the first-named learned doctor, edited, materially enlarged, and brought up to the standard of knowledge acquired up to the present date by the last-named clever experimentalist, needs little else to recommend it beyond the bare announcement of its appearance. To the scientific photographer such a book of reference must be of great value; for the science of chemistry embraces the recognition of so large a number of facts, that the most accurate memory with which any human being is blessed would be quite inadequate to the retention of more than a per-centage of them without the assistance of written records to consult as occasion demands. As a matter of course, all the chemicals in which photographers are interested are duly treated of in their respective places, with descriptions, summaries of important characteristics, and special tests for their detection. In addition there is also a special chapter, by Dr. Taylor, "upon the chemical principles on which photography is based," together with "some practical rules for the guidance of those who wish to apply their chemical knowledge to this interesting art;" and when any photographic chemical is under consideration its photographic uses are generally noticed—a peculiarity not found in most other works on chemistry.

On turning to the chapter specially devoted to our art, we find some statements made that a little surprise us; but it is abundantly evident that the author is a practical as well as a theoretical photographer.

It would be presumption on our part to question any authoritative assertion, upon chemical matters, made with due consideration by Dr. Taylor; but is there not some oversight in the following, viz.: "The iodide and bromide of silver do not darken by exposure to light," &c.? Unless the word "darken" be used in a sense different to that which we attach to it, *bromide* of silver does darken by exposure to light, and in that it differs from the iodide of the same base.

An interesting corroboration of the soundness of principle involved in Petschler and Mann's process is found in the following quotation:—"We have preserved paper prepared with chloride of silver, but containing an excess of chloride of sodium, for twenty-two years. Under strong solar light it retained, after this long interval, sufficient unchanged chloride to yield an impression from a collodion negative."

When discussing the action of light through coloured media Dr. Taylor says:—"In no instance, however, are the chemical rays completely intercepted; for a long exposure will slowly lead to a change of colour in the paper. The chemical action of light is therefore determined by the difference between the accelerating and retarding rays of which white light is constituted. Colourless light, however, produces, *cæteris paribus*, a more rapid and complete change than the isolated blue rays of a coloured medium." To this we cannot refrain from bringing in a verdict of *not proven*. We believe it to be quite possible to arrest completely the chemical rays. The fact of *paper* becoming discoloured after *long* exposure proves little to the purpose, because *paper* becomes discoloured by *long* keeping even in perfect darkness, unless all moisture be carefully withdrawn. We cannot concur in the view taken of the action of light being "determined by the difference between the accelerating and retarding rays." The conclusion of the sentence quoted, itself controverts this proposition; besides which, M. Claudet noticed many years ago that yellow light is capable of carrying on further the im-

pression upon a Daguerreotype plate that has been previously induced by ordinary daylight.

The following is a point for consideration :—"These remarkable effects, produced by the coloured rays of the spectrum, have not received any explanation on the undulatory theory of light; and it seems difficult to understand how an undulation, or any mechanical vibration, producing a violet colour, should break up the chemical composition of chloride of silver, while that which produces a yellow or red ray should have little or no effect upon this salt." Difficult to understand it may be, yet we cannot perceive that it is more so than the two following facts, apparently opposed, viz., the composition of water, induced by the action of the electric spark upon a mixture of oxygen and hydrogen gases, in proper proportion, in the one case, and the decomposition of water by voltaic action in the other. Some curious researches were made "on the optical and chemical extinction of the solar rays," by Messrs. Bunsen and Roscoe, details of which we reproduced from the *Philosophical Magazine* some years ago. The experiments showed clearly enough that the actinic force, whatever may be its nature, exerted up to a certain point, was entirely expended, or, to be more accurate, entirely converted.

While we question conclusions in general physics arrived at by Dr. Taylor, we willingly bow to his chemical decisions, however much they may interfere with our previously-existing ideas on the subject, though we see no reason for avoiding the expression of surprise at some of them. For instance, he says:—"It may be inferred from the effect of reducing agents that the changes consist in a deoxidation of the nitrate, and a *deiodisation of the iodide of silver.*" And further on:—"Neither the gallic nor the pyrogallic acid exerts any reducing action on the chloride, bromide, or iodide of silver, except in the presence of an excess of nitrate, when *both* the oxysalt *and haloid compound are decomposed.*"

We presume that Dr. Taylor has ascertained this as a fact, though we were under the impression that the iodide of silver played no part but a directive one in the actual formation of the image.

It is possible that this assertion may be only an opinion expressed rather than a conclusion worked out; and this appears to be not improbable from the following:—"As the result in the application of the reducing agent is the same, whether it is employed immediately, or after eighteen hours (if the plate has been kept in the dark), it is clear that this molecular displacement of the atoms of silver and iodide *is not of a temporary kind*, as the power of bringing out the image would be speedily lost."

But what if the plate be kept, say three or four days after exposure? Now, it is an ascertained fact that, with Dr. Hill Norris's plates, which probably contain no organic matter, the image cannot be developed after keeping for a certain time subsequent to exposure, and that the plate returns to its original sensitive condition.

We do not make these remarks in any cavilling spirit: we are desirous of inducing Dr. Taylor to examine still further into some of the photographic mysteries that still torment us. His acuteness of observation and chemical knowledge are the very qualifications most needful to their solution. We have ventured to question some of the theoretical propositions advanced: on the practical instructions of so able a chemist we are not rash enough to cast a doubt. It must not be forgotten that the work before us is a *Manual of Chemistry*—and we may justly affirm one of high value; but we have regarded it solely from a photographic point of view, that being its most important aspect to our readers, and in spite of any real or imaginary theoretical heresies that it may contain relative to our art, those of its followers who desire to pursue their chemical studies further than they have hitherto extended them, cannot do better than avail themselves of the present opportunity of securing a work on the subject that affords them the means of acquiring all the most recent information in that fascinating branch of science.

Meetings of Societies.

NORTH LONDON PHOTOGRAPHIC ASSOCIATION.

An ordinary meeting of the above Association was held at Myddleton Hall, Islington, on Wednesday evening, the 19th ult., — George Dawson, Esq., M.A., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed. Messrs. H. Hemans and — Lonsdale were elected members of the Association. The presentation prints—*A View on the Severn* and *A Peep Through the Trees*—by Major Gresley, were distributed to the members.

Mr. St. George, of Gloucester Place, Kentish Town, very generously presented to the Association for distribution among its members one hundred *carte-de-visite* portraits of the Rev. T. F. Hardwich. These portraits were executed in Mr. St. George's usual excellent style, and were very highly appreciated by the members—not only on account of their superiority as photographs, but also on account of the interest attaching to the portrait of a gentleman who has achieved so high a position in connexion with photographic science. Mr. St. George, by presenting these portraits, very happily succeeded in gratifying a desire felt by every earnest photographer, and received hearty acknowledgments, a vote of thanks for the gift having been passed by acclamation.

Mr. Hill exhibited some very charming panoramic landscapes by the wet collodion process, taken with Dallmeyer's triplet. The views were taken principally in the north of Devon.

Mr. Thomas Ross distributed for examination a number of *carte-de-visite* portraits, by various artists, illustrating the capabilities of the lenses constructed by him for that purpose.

Messrs. Southwell Brothers exhibited some *cartes de visite*, which were remarkable for their exquisite softness combined with brilliancy.

Mr. How (successor to the old-established firm of George Knight and Sons, Foster Lane) showed some cameras and lenses intended for use in India; also some *cartes de visite* taken with Maddison's collodion and iron developer.

The Chairman read the following letter from Mr. A. H. Wall:—

Sir,—Having just read a letter from the celebrated painter, Mr. G. Lance, published in the papers of to-day, suggesting that his brethren of the brush should unite with him in aid of the Lancashire Operatives' Relief Fund, by painting each a small picture, to be sold for that special purpose at the ensuing Exhibition of the British Institution, may I venture through you and the Society over which you preside to make a similar suggestion.

It is urged that, as the British Institution will be opened in February, the proposed aid would be raised at a time when it would prove to be most needed. Now photographers have also an Exhibition which will be opened at an even earlier date, and I think we have yet to learn that as a body we are more wanting in charity and patriotism than professors of the sister arts.

I therefore venture to suggest that a certain number of proofs from the negatives of works exhibited should be set apart and announced in the Catalogue as for sale in aid of the funds now being raised for the relief of our unfortunate and patiently-enduring countrymen in the north.

Trusting that you will kindly see fit to proffer this suggestion in the course of the evening, and permit it to appear in the report of the proceedings of the Association, I am, Sir,

Yours faithfully,

A. H. WALL.

Mr. Hislop was then invited to read his paper, entitled *Some Additional Notes on Plain Washed Collodion for Dry Plates.* [See page 442.] At the conclusion of the paper Mr. Hislop exhibited some very excellent negatives and transparent positives taken by the method described in his paper. In reply to questions from Mr. Seeley, relative to his method of obtaining pictures on dry plates, Mr. Hislop stated that the development was effected as quickly as in the wet collodion process, and that the transparent positives were taken by superposition; moreover, that the process was a very certain one, since if he went out with twelve dry plates he should expect to return with twelve pictures, and, further, that he had found hot water occasionally advantageous in developing, though there was always a difficulty attending its use, arising from the drying of the plates.

The Chairman directed attention to the evidence there was of the the *piling up* of the silver forming the image in some of the negatives, being sufficient, in one or two cases, to make them suitable for matrices from which to obtain moulds.

Mr. Hill believed that under-exposure and over-development was a common mistake in the working of the dry processes.

The Chairman thought it strange that the subject of plain washed dry collodion plates should have been so long mooted, and yet so little practised. He recollected seeing a communication by M. Gaudin so long ago as 1854 on this subject. Messrs. Spiller and Crookes had also written thereon; but, not finding it answer their expectations, had resorted to nitrate of magnesium, honey, sugar, &c., as preservative agents. He (the Chairman) had never seen any results by this process at all to be compared with Mr. Hislop's, and as he had indicated the kind of collodion with which the process might be successfully practised, he thought the matter ought not to be lost sight of, the collodion being, doubtless, the all-important point. He believed bromides would be found necessary, and that half the usual exposure might be given; and if a collodion could be obtained which would be sure to stick to the plate they should be able to abandon the collodio-albumen and tannin processes, which involved such complicated manipulations in the preparation of the plates.

Mr. Hill reminded the meeting that Mr. Barnes had some years since written on the subject then under discussion, and that, in order to ensure the adhesion of the collodion to the plate, he had recommended a prelimary coating with chloroform varnish or India-rubber solution.

Mr. Hislop said that Mr. Barnes had used camphor in his dry collodion process.

Mr. Simpson thought that where a particular process admitted of being successfully worked out it was generally found that the real inventors were the persons to do it; and it would probably be remembered that Mr. Archer and Dr. Diamond had experimented in the direction then under discussion *before* 1854, but had abandoned that method of working dry plates on account of the uncertainty attending it. It was gratifying, however, to learn that Mr. Hislop had found a collodion in the market with which his method of working might be successfully prosecuted, and they might now hope to see some advance made with plain washed dry collodion.

Mr. Dawson having vacated the chair for the purpose of reading some *Notes on Instantaneous Shutters* [see page 445], Mr. Hislop occupied it during the remainder of the evening. At the conclusion of Mr. Dawson's paper, the chairman solicited Mr. Blanchard's opinion on the instantaneous shutters which had been exhibited.

Mr. Valentine Blanchard, in reply, thought Mr. England's shutter

unquestionably the best, since what was wanted (if he might use the expression) was an intelligent apparatus, completely under the control of the operator, and that he thought might be found in the form of shutter used by Mr. England. The apparatus he (Mr. Blanchard) used was a modification of Dallmeyer's shutter, except that he placed his inside the camera, by which means he secured a longer exposure for the foreground than for the sky of the picture. The objection to the form alluded to by Mr. Dawson as the oldest was that it was too quick, except for waves of the sea in bright weather.

Mr. Morley assumed that an exposure commencing from the centre was best for portraits.

Mr. Blanchard decidedly objected to that form of shutter which favoured the longest exposure for the centre, since he thought the centre could generally take care of itself in that particular.

Mr. Dawson suggested that the time of exposure might be varied by elongating the circles into ovals or still larger figures. If the long axis were made twice as long the exposure would of course be increased in proportion. The shutters would then, however, become very cumbersome, since the framework would undergo a corresponding increase in length.

Mr. Blanchard added that, the time being fixed, there would be no modifying it, which was an undoubted disadvantage. He could readily understand Mr. Wilson's partiality for his Scotch cap in the capacity of an instantaneous shutter, it was so very obedient.

The next meeting was announced to take place on the 17th December, to which date an adjournment then took place.

SOUTH LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society took place at the City of London College, on Thursday, the 13th November, at half-past eight o'clock, p.m., —G. Wharton Simpson, Esq., Vice-President, in the chair.

The minutes of the last meeting were read and confirmed.

The Chairman directed attention to the following objects sent for exhibition that evening:—A photozincograph of the *Chapel of the Southampton Infirmary*, executed at the Ordnance Map Office, and sent to illustrate the progress which had been made in the production of half-tone—a fact to which it bore the most satisfactory testimony, as there were at least five gradations of tint present in the print; a series of geological studies of the rocks of Dartmoor, by Mr. J. J. Cole, on Hill Norris's plates, which were modestly called "good intentions" by the artist, but which specimens might fairly be regarded as very "satisfactory fulfilments" of the object aimed at in the selection of the subjects.

Mr. Wall, in commenting on their merits, regarded them as extremely useful to students in drawing, preserving as they did a faithful representation of the peculiar scenery of Dartmoor, and illustrating the fact that every kind of rock had its peculiar and characteristic features.

A reproduction, by the Secretary, from a lithographic portrait of Handel, possessed great brilliancy, and elicited some interesting remarks, to which we shall presently refer.

A very successful enlargement, by Mr. Wall, on resinised paper, showing the peculiar suitableness of paper so prepared for such purposes, was examined with much interest.

The Chairman was the bearer of two instantaneous stereographs from tannin negatives, sent by Mr. Hurst, of Mirfield, Yorkshire. The negatives of which these were prints were said by Mr. Martin to have been taken with collodion supplied to Mr. Hurst by Messrs. Horne and Thornthwaite for the purpose; and taken, as they had been, in the month of November, on dry plates, they bore favourable testimony to the quality of the collodion, as well as to the undoubted skill of the photographer.

Mr. Harmer exhibited his two albums—one containing the photographs printed in the peculiar style first introduced by that gentleman, and the other six chromo-photographs on litho-tinted papers. Two of the latter were kindly presented to the Society's portfolio.

Mr. Warner, of Ross, showed his large album of photographic landscapes and studies of architectural subjects, of the *carte-de-visite* size, noticed in our report of the first meeting of the Photographic Society of London.

On the proposition of the Chairman, thanks by acclamation were accorded to Mr. Harmer for his gift, and to the other gentlemen who had contributed to the interest of the evening by the exhibition of their photographs.

In the absence of the promised paper from Mr. Fry, the Chairman invited Mr. H. Cooper, Jun., to read a short paper which he had prepared on *Printing on Resinised Paper and Silk*. [See page 444.]

Mr. Cooper illustrated his paper by some exquisite specimens of his great skill in the process he has introduced. Among them were *carte-de-visite* and vignette portraits, and groups on resinised paper, silk, cambric, and calico. The paper and silk pictures were brilliant successes—the latter certainly of the highest order; but the cambric and calico were manifest failures, and, indeed, were only shown by Mr. Cooper to illustrate the unsuitableness of those materials for the purpose in question.

Mr. Martin, at the conclusion of the paper, asked Mr. Cooper the reason for abandoning the chloride of cadmium, which he had originally used, in favour of chloride of calcium?

Mr. Cooper preferred the latter salt on account of its more ready solubility in alcohol and its lower price.

The Chairman (in reply to questions from Mr. Martin and the Secretary) stated that Clausel's encaustic paste was manufactured from a recipe given by the late Prince Consort to Mr. Rejlander, and consisted of wax, oil of lavender, and *oglio cotta*. It was not necessary to apply it uniformly over the whole surface, but it could be applied with a brush to those parts of the print to which it was desired to communicate increased brilliancy and transparency.

Mr. Martin thought that an additional advantage accruing from the use of this paste would arise from the protective influence which it exerted on account of the imperviousness of its constituents to atmospheric moisture.

Mr. Wall, regarding the preparation from an artist's point of view, thought it would be a convenient one to apply to those photographs which required "touching up" with water-colour, the gloss which it imparted rendering detection of the brush-work very difficult.

Mr. Martin, recurring to Mr. Cooper's reply relative to the substitution of chloride of calcium for chloride of cadmium, asked if the latter salt was not sufficiently soluble to yield fifteen grains of chloride to one ounce of alcohol? as, if it were so, he thought it a pity to abandon a permanent salt like chloride of cadmium for one so deliquescent as chloride of calcium, which, he thought, could not exert any beneficial effect on the salted resin paper.

Mr. Cooper stated that the chloride of cadmium was not sufficiently soluble to yield fifteen grains to one ounce of alcohol; and, in reply to a question from the Secretary, he stated that fifteen minutes' immersion of the resinised silk in the sensitising solution was absolutely necessary.

Mr. Howard suggested that a similar amount of brilliancy to that yielded by encaustic paste might be communicated to the resin paper prints by floating them after they were finished on a weak solution of albumen. The objection to the ordinary albumen prints was the necessity there was for bringing that substance in contact with nitrate of silver and hyposulphite of soda, and the admitted difficulty there was in removing the latter substance. The resin paper process was free from those objections, but was deficient in gloss; and it occurred to him that the advantages of both processes might be combined by a final coating of albumen.

Mr. Wall thought that, in advocating the use of albumen, Mr. Howard was overlooking one advantage attaching to the use of encaustic paste, which imparted only a *limited* amount of gloss, while albumen glaze was generally regarded as too brilliant.

The Chairman adverted to a further disadvantage of albumen applied in that way, namely, that it would be soluble under any circumstances.

Mr. Price thought the sulphur in the albumen would have a tendency to turn the prints yellow.

The Chairman thought the paste would yield the best results with the fewest difficulties.

Mr. Cooper said that another objection to the application of albumen at the time and in the manner suggested by Mr. Howard was, that it would be so liable to be soiled in the mounting, while the encaustic paste might be applied in suitable quantity to any part of the picture, requiring of course the judicious exercise of taste.

The discussion on Mr. Cooper's paper seeming to abate, Mr. Wall, alluding to the reproduction shown by the Secretary, and mentioned at the beginning of our report, said that the members would doubtless be glad to know by what method so highly satisfactory a result had been obtained.

The Secretary could not say there was anything new in the method he had adopted: the print had been toned in an ordinary acetate of soda toning bath.

Mr. Fitch asked how the negative had been intensified?

The Secretary thought the method he had adopted the worst that could be used, but in the present state of our knowledge he had used it for want of a better. He referred to the process by bichloride of mercury and iodide of potassium, which was open to the objection of causing the negatives to turn hard in the process of printing. He had some negatives then in his possession which, at the time they were finished, possessed all the qualities that could be desired in reference to middle tints, &c. In the course of printing, however, they had undergone such a change as to make them quite useless. The foregrounds, which at one time yielded soft and pleasing prints, were then so hard as to impart to the prints the appearance of a snow scene. He was sorry to add that he had found that an invariable accompaniment of the mode of intensifying to which he had referred.

An animated discussion then ensued, in which the Chairman, Secretary, and Messrs. Wall, Warner, Blanchard, and others, took part. The experience of these gentlemen coincided with that of the Secretary, and general regret was expressed thereat; while no definite conclusion was arrived at as to the cause of the untoward result referred to.

Mr. Warner, of Ross, instead of iodide of potassium had used ammonia and iodide of ammonium, in the proportion of fourteen grains to an ounce, as he thought with manifest advantage.

Mr. Blanchard stated that, although his experience had in many instances agreed with that of the gentlemen who had taken part in the discussion, it had in other cases differed in this respect, that although the change so much to be deprecated had invariably taken place when he had used pyrogallic and silver *after* the bichloride of mercury and iodide of potassium, it had not occurred in those cases wherein he had succeeded

in obtaining the requisite intensity without the subsequent application of pyrogallic and silver. He desired it to be understood that his original development was effected by means of iron; that the plate was then washed and fixed previous to the application of the intensifying solution, so that no trace of free silver could be present—thus pointing, as he could not help thinking, to the conclusion that free silver was the cause of the spontaneous loss of half-tone in the negatives treated in the manner then under discussion.

Mr. HOWARD thought that the spirited manner in which the discussion had been conducted was good evidence of its being a suitable subject for a separate evening. Meanwhile, he thought the meeting might with advantage return to the subject introduced by Mr. Cooper. In his (Mr. Howard's) opinion the introduction of resin paper marked a new era in the history of photographic printing, inasmuch as it seemed to offer a guarantee of permanence in the photographs obtained thereby; and that was no small advantage in view of the increased suspicion with which the public were beginning to regard photographic prints, which they erroneously conceived had a *general* tendency to turn yellow and fade because an *occasional* instance of the kind had occurred in the experience of some. He admitted that the public were in some degree justified in that view of the matter, owing, doubtless, to the absence of sufficient care by those who produced prints commercially. There were many points in connexion with the resinised paper process which had yet to be followed out to a satisfactory conclusion; and, although the weather at that time of year was unpropitious, he still thought it only fair to Mr. Cooper that gentlemen should experiment on the matter, in order that they might be able to give that gentleman a hint, who had already furnished so much information on the subject.

Some further discussion then ensued on the relative merits of albumenised and resinised paper prints, and the suitability of resinised paper for enlargement; the meeting after was adjourned.

HISTORIC SOCIETY OF LANCASHIRE & CHESHIRE.

THE *public* demonstrations of photography at Liverpool—once a stronghold of the art—have latterly, we regret to say, become like "angels' visits." Many circumstances, unknown to the outside world, have contributed for a time to leave it in abeyance; but we trust that its resuscitation at the third ordinary meeting of the session of the Historic Society, which was held at the Free Public Library, on Thursday evening the 20th ult.—when the camera and its products supplied an evening's profitable entertainment—will prove to be the forerunner of many future photographic *séances* at the Historic Society's meetings, if not at a more congenial place. J. T. Towson, Esq., F.R.G.S.,—aforetime a fellow-labourer with Mr. Robert Hunt in photographic research,—occupied the chair on the occasion.

After due acknowledgment of the donations to the Society's library, Mr. J. A. Forrest exhibited four portraits, life size, enlarged from a quarter-plate negative, by Woodward's solar camera, as improved by Mr. John Atkinson, of Liverpool, which attracted much attention. Mr. Forrest also exhibited a solar camera, and showed how enlarged pictures were produced.

The Chairman exhibited a Daguerreotype produced by a non-achromatic lens in 1842; also a beautiful miniature photograph on ivory.

Mr. Sansom gave the details of a recent visit to the Ordnance Works at Southampton, and explained Colonel Sir Henry James's photozincographic process, by which the multiplication of the Ordnance Maps is accomplished, and by which *Doomsday Book* and the folio and quarto editions of the original Shakspeare are in course of reproduction.

Mr. Newton drew attention to photography as a means of illustrating the letterpress of books, and showed several maps and prints reproduced with great accuracy, either of enlarged or diminished size.

The paper for the evening was *On Panoramic Photography*, by Mr. Thomas Sutton, B.A., of Jersey [see page 451], who sent numerous pictures illustrative of the excellence of the panoramic lens, as now manufactured by Mr. Thomas Ross. The paper was read by Mr. Forrest, who exhibited and explained the instrument. He also exhibited two pictures, one taken by an ordinary lens, and the other by the panoramic lens, with the object of showing the larger extent of angular field covered by the latter than by the former, and the sharpness of detail to the edges of the picture. Several pictures taken with the lens, at Bath, by Mr. George Dawson, A.M., of King's College, were also handed round and much admired.

After an interesting discussion on the paper—which, to the initiated, contained, of course, nothing new—thanks were voted to the author and reader of the paper; and with this a very pleasant evening with photography was brought to a close.

MICROSCOPICAL SOCIETY.

A MEETING of the above Society was held at King's College, London, on Wednesday, the 11th ult.—R. J. Farrants, Esq., in the chair.

The minutes of the previous meeting were read and confirmed.

Mr. G. SHADBOLT read a paper, by Dr. Maddox, *On the Application of Photography to the Delineation of Microscopic Objects*, and exhibited about eighty well-defined specimens of printed photographs of microscopic objects taken by Dr. Maddox. He (Mr. Shadbolt) said that it was evident that the Doctor practised what he preached; and, moreover, that it might not be said that "the Doctor can do this, but who else can?" Dr. Maddox had, at his instigation, consented to undertake professionally to photograph microscopic objects which might be sent to him for the purpose. Mr. Shadbolt also observed, with regard to utilising negatives, that many years since, in the early days of the *Quarterly Journal of Microscopic Science*, there were two proofs of microscopic objects published by Mr. Highley, at which time there was considerable difficulty in getting a sufficient number of copies in time to appear with the then current number of the Journal; but he might mention the fact that now Colonel Sir Henry James had lately discovered a method for producing gradation of half-tones capable of being transferred to zinc plates, and from which proofs in any number could be printed off in printing ink. He (Mr. Shadbolt) had not the slightest doubt that by the Colonel's process a work could be very cheaply illustrated, as he had been informed by Colonel James that the cost of prints about four times the size of the page of the *Quarterly Journal of Microscopic Science* did not exceed one penny.

Mr. HIGHLEY said that the cost of each of the prints by his old process was 6d. for an octavo page.

Mr. INCE asked whether Dr. Maddox had applied his process to the magic lantern?

Mr. SHADBOLT replied in the negative; but stated that it was a singular fact that there was a gentleman present who was negotiating with Dr. Maddox relative to the very thing inquired after.

Mr. HIGHLEY had undertaken the work for the magic lantern, and there were several beautiful slides to be published at once.

The Rev. J. B. READE observed that Dr. Maddox had stated in his paper that if the focus were arranged under sunlight there was great danger both of the object and the negative being destroyed. In 1837, when he (Mr. Reade) was engaged in similar experiments, using the solar microscope, he, with a hemispherical condenser, condensed all the light and dispersed the heat, so as to render it impossible to affect in the slightest degree the thinnest film of bee's wax; so that in a single drop of water containing *Infusoria* the creatures would remain entirely happy and playful, and he was then able to use Ross's objectives mounted in Canada balsam, and believed that that was the first time that objects mounted in Canada balsam had been used with the solar microscope. The collodion process was unknown at the time of his experiments, and he worked with gallo-nitrate of silver on paper. He thought that Dr. Maddox might find some advantage in reproducing the kind of arrangement which he (Mr. Reade) adopted for dispersing the rays of heat.

Mr. HIGHLEY said he had adapted a hollow cell filled with a solution of alum for dispersing or absorbing the heat rays when using the solar microscope for living objects.

The Rev. J. B. READE said his arrangement of the position and form of the lens was communicated to the Royal Society in 1856, and an abstract of the paper published in the *Transactions* of that Society.

Mr. SHADBOLT then read an article, entitled *Further Notes on the Acari Found in the Nitrate of Silver Bath* [see page 446], by the same author, and stated that although the paper was sent to the Editor of THE BRITISH JOURNAL OF PHOTOGRAPHY, yet it contained matter which was so interesting to the Microscopical Society as to merit discussion.

Mr. RICHARD BECK said he had had the pleasure of examining the *Acari* of Dr. Maddox and those found by Mr. Sterry, and had no doubt they were of the same species. Mr. Sterry found them in all parts of his dark room. Dr. Maddox found them in the nitrate bath, covered with a secretion protecting them from the action of the bath. Mr. Sterry found them swarming in hundreds in the boards of his room. He (Mr. Beck) had many of them then at the meeting, which the members might compare with Dr. Maddox's and with Cross's *Acari*, and believed that all three were of the same species. Though there was the interesting fact that they lived in the nitrate bath, yet Mr. Beck doubted that being their natural *habitat*.

Mr. STERRY said that, since his last communication, he placed some *Acari* in a tube, and a few days afterwards he noticed some ova, and a fortnight after one hatched, which he lost; but the shell was still there from which the *Acari* came out. He had not ascertained upon what they lived, but he found they would eat bread. He thought they lived on the wood of the room, where he found them in great numbers. Mr. Sterry had seen them in nitrate of silver, and in distilled water, but never there alive.

Mr. JABEZ HOGG was glad at last to find some solution to the mystery, and observed that these *Acari* were to be met with almost everywhere. He had found them alive in very strong arsenical solutions, so that their digestion must be strong. He believed they must have been conveyed there through the air.

Mr. CORNELIUS VARLEY had some presented to him alive in small glass tubes, in which they laid their eggs. He had thirteen, which were as different from a cheese-mite as a bull-dog was from a greyhound.

Mr. RICHARD BECK said there were several species of *Acari* in Mr. Sterry's photographic room, but the particular species under discussion were very different from the cheese-mite, and any one looking at them, as far as at present could be judged, would say that Dr. Maddox's, Mr. Cross's, and Mr. Sterry's were identical.

It was then announced that Mr. Whiteley Ward, of Halifax, presented to the Society's cabinet seven slides; after which the meeting resolved itself into the usual *conversazione*.

Notes of the Month.

THE past month of November has, on the whole, sustained its bad reputation for fogs, and general hostility to all photographic pursuits. Printing, under such unfavourable conditions, becomes a most tedious occupation, and calls for more than an ordinary share of patience from all those—whether amateur or professional—who are anxious to get results from their summer plates. At such seasons projects for printing by artificial light are revived and eagerly discussed. One distinguished photographer in composition subjects suggests the formation of a joint stock company, starting with an establishment, on a large scale, in some quarter easy of access, where all could send printing-frames for exposure; the establishment to be carried on by day and night during the winter months, and the entire privileges to be secured by payment of a small fee or annual subscription. The idea is not an impracticable one, and might bear further development. That prints of the finest quality may be so obtained was abundantly proved by the views exhibited by Mr. Francis Bedford at the last Exhibition of the Photographic Society in Pall Mall. The cost of plant and the working of it—which has been one of the greatest objections—might thus be reduced to its minimum.

Photolithography has been the "sensation" subject of the past month, which has also witnessed the resuscitation of Mr. Pouncy's claims, together with some new ones. It has led, at any rate, to a thorough ventilation of the subject, and the photographic world has much clearer notions than before as to the relative or particular merits due to each of the many Hotspurs in the field: there is also an assurance that decidedly the great *desiderata* in photography—

Dry Collodion, instantaneous,
Positive Image, by a permanent process,
Enlargement, as perfect as possible—

are not being lost sight of. Major Russell is making some very promising experiments with the new auxiliary to the first-named; and our Glasgow compeers have taken up the subject of enlargement with energy, and, it is said, with unusual success.

Specimens of natural structure, so enlarged by photography as to be visible in all parts of a lecture theatre—thus very materially assisting in the demonstrations of the professor of anatomy and natural history—have been laid before the Academy of Sciences at Paris, by M. Chevalier.

For the first time, the Council of the London Photographic Society announces its intention of giving medals at its Ninth Annual Exhibition, which will be held in Suffolk Street, Pall Mall. The usual gallery of the Water Colour Society having been greatly enlarged and improved, is no longer obtainable, but will be opened as a Winter Exhibition of water-colour drawings. From the facts of the Photographic Society not holding any Exhibition last season, and that three-fourths of almost every one's display at the International Exhibition were not new subjects, a good Exhibition may reasonably be expected.

The first proceedings under the new Copyright Act have been instituted during the past month. Apart from any interesting features they may present they will be watched with interest by the photographic world, as establishing "precedents," and showing the practical working of the new law. In a letter to the daily press, M. Gambart speaks of publishers, like himself, being aware of the great demand for small and cheap reproductions, and throws out a hint that he may one day discard his one thousand subscribers at fifteen guineas, and court the patronage of a million at one shilling, when he sees that the million will produce the large total. M. Gambart may unhesitatingly believe that it would; and, on the principle of *similia similibus curantur*, would be the most effectual cure for piracy—far more so than any clumsy legal machinery. Good reproductions by a better class of photographers than those who stoop to the dissemination of piracies would sell to the desired extent, and might be copied from finer proofs than it is in their power to obtain. The price need not be higher; but shopkeepers would readily buy legal copies at a higher rate, if finer, and moreover such as they could fearlessly expose in their windows, instead of keeping *sub rosa* in a portfolio. In the second case, the piracies were chiefly from *cartes de visite* for exportation, and some not very creditable disclosures may be expected.

There is at present no decrease in the popularity of card-portraits. Not less than five new studios in Regent Street are now building. The number already there last year was thirty-nine, which, with a few since opened, will bring the number up to about fifty!

S. T.

Scraps and Fragments.

TURNER'S LIBER STUDIORUM.—Messrs. Cundall and Downes announce the publication of a second series of photographs from the original drawings for Turner's *Liber Studiorum*. The series will be 21 in number, making, together with the first, a total of 51.

FORGERIES OF BANK NOTES.—The following has been going the round of the newspapers:—A new mode of engraving bank notes has been brought forward, which cannot be photographed, nor be copied, nor produced again, without the matrix, which is formed in kaleidoscope fashion; so that if that is handed to the custody of the bankers they hold their own security.

CARD PORTRAIT OF THE REV. T. F. HARDWICH.—One hundred copies of a very excellent likeness of "the photographer's friend," as he has been frequently styled, have been presented for distribution amongst the members of the North London Photographic Association by Mr. St. George, of 31, Gloucester Place, Kentish Town, a compliment that was highly gratifying to the members present at the meeting, and we have no doubt will be as pleasing to the absentees *when* they receive their copies.

PHOTOGRAPHY IN THE DIVORCE COURT.—Our art has frequently been called into Court to do the bidding of the officers of justice in completing the chain of evidence against one offender or another. In a recent case (Gill *v.* Gill and Hogge) tried before Sir C. Cresswell, who presides over a Court which has unfortunately become a "peculiar institution" in our legal world, photography played an important part. It appears that enlarged photographs of the frail respondent and co-respondent had been forwarded to the continent, in order to establish the identity of both delinquents, in their unhappy *liaisons* at various hotels, before a commission appointed for the purpose. At the recent trial at the Court for Divorce and Matrimonial Causes, the depositions of several witnesses to whom the photographs were shown went to fix the identity of the guilty pair; but on the Queen's Advocate submitting that the petitioner's case had been established, mainly through the respondent's likeness having been recognised without hesitation by all the witnesses, and that it was a large and well-executed photograph, the following treason as to the sun's fidelity was uttered by the Judge Ordinary:—"I have seen some a good deal larger that I could not recognise at all!" Thereupon the arch-unbeliever in Sol's truthfulness "took time to deliberate"—not on the question of costs, but on the question of identity. Who or what is at fault? Surely not the unerring camera, but the legal functionary's optics.

HAVING YOUR PHOTOGRAPH TAKEN.—There are few periods of a peaceable man's life more deserving the name of "*un mauvais quart d'heure*" than the space of time he is beguiled into spending in a photographer's studio. Of itself the attempt to select your own best expression of countenance is a perplexing effort, and the consciousness that the face you put on, whatever it may be, will be the one by which, in all future time, all who look into your friends' albums will know you, does not diminish the embarrassment. You have a vague expression that to look smiling is ridiculous, and to look solemn is still more so. You desire to look intelligent, but you are hampered by a fear of looking sly. You wish to look as if you were not sitting for your picture; but the effort to do so fills your mind more completely with the melancholy consciousness that you are. All these conflicting feelings, pressing upon your mind at the critical moment, are very painful; but they are terribly aggravated by the well-meant interposition of the photographer. To prevent a tremulous motion of your head which the bewildered state of your feelings renders only too probable, he wedges it into a horrible instrument called a "head-rest," which gives you exactly the appearance as if somebody was holding on to your hair behind. In such a situation you may be pardoned if a somewhat blank look comes over your usually intelligent features. The photographer, of course, sees this defect, and does his best to remedy it by a little cheerful exhortation; but naturally with no other result than that of making matters much worse. "Just a little expression in your countenance if you please, sir—perhaps if you could smile," is a most distressing admonition to receive at such a moment, just when you know that the photographer has his hand upon the cap. If you are weak enough to listen to him, and extemporise a little expression, you come out on the plate with a horrible leer, looking like the Artful Dodger in the act of relating his exploits.—*Saturday Review.*

SALE OF MR. FENTON'S PHOTOGRAPHIC APPARATUS.—The boys in King-street, Covent-garden, found new food for wonder and

amazement on the 11th ult., in the shape of Mr. Roger Fenton's well-known photographic carriage, standing outside the door of Mr. Stevens's auction rooms. Clambering into the driver's seat, over the roof, and into the window, they speculated in vain as to its probable use, and marvelled greatly. No less conspicuous in the sale-room itself was the monster camera for taking pictures 32 inches square, which was sold for £18, although its original cost was stated to be £40. The sale was tolerably well attended, and the bidding proceeded briskly on each of the three days of the sale. There was much competition for the lenses, rather less for the cameras and apparatus, and still less for the negatives and photographs; while the draperies, costumes, lay figures, and a ghastly, dusty, ricketty-looking skeleton, tottering erect upon a stand, were least attractive of all. We recognised among those present photographers from all parts of the country, although our best London professors were by no means so well represented. Most of these gentlemen had come to purchase some one special thing, or more, which chanced to be known to them by repute or otherwise, and that one thing, or more, they seemed determined, at any cost, to possess. Nevertheless, the bidding did not in any case go far, if at all, beyond the actual value of the articles displayed, and there were certainly a series of very great bargains obtained by many who were present. The prices secured for cameras—of which there were many, all of which had evidently seen much service—ranged from £1 7s. to £13 10s., and the aforesaid £18. The lenses secured prices ranging from £1 7s. to £19; and the negatives, many of which had never been either published or exhibited, were sold at prices ranging from a few shillings to between one and two pounds each negative or lot. The lots contained from four to a dozen negatives; but very many of these were damaged more or less seriously.

Dove's Photometer.*—The new photometric method proposed by Dove has the advantage over those now in use—that it is equally applicable to the determination of the intensity of the light proceeding from a bright or faintly luminous body, whether it be white or coloured, transparent or opaque. It is suitable also to determine the amount of light transmitted by optical instruments. The apparatus used is the compound microscope, which is usually brought into a horizontal position. A minute photograph, representing black letters on a white (transparent) ground, or simply a cross on a similar ground, is placed on the stage, and viewed under a power of from twenty to sixty diameters. The letters will of course appear, by transmitted light, black on a white ground, and white on a black ground by reflected light; while the two illuminations can readily be balanced, so that the letters are made to disappear. This is perhaps most elegantly effected by the use of two Nicol's prisms—one placed under the stage, the other directly behind the objective or eye-piece. By the revolution of either prism the transmitted light is weakened till the compensation is exactly effected, and the letters made invisible. The compensation may also be effected by reducing the size of the aperture under the stage, or by varying the distance of the luminous body which stands in the axis of the microscope. The light furnished by two candles is compared by placing them one at a time in the prolongation of the axis of the compound body, and varying their distance from the microscope till the compensation has been made for each separately. Their distances from the microscope are measured, and furnish the data for calculating the relative amounts of light emitted, the zero of the scale being the microscopic photograph. The intensity of the light in various parts of the spectrum is measured by allowing different portions of it to fall on the under side of the photograph and effecting compensation. Nothing can be simpler than the application of this method to the determination of the equality or inequality in the amount of light transmitted by, or reflected from, differently-coloured subjects. Dove recommends that photographs should be especially executed for this photometer; and I have found, in fact, that some are more delicate in their indications than others. The letters or figure ought to be very sharp at the edges; for if they are surrounded by an outline differing a little in density from the central portions, this in practice becomes a dividing band between the two shades, and renders compensation difficult. It would also be well to remove the iodide of silver by cyanide of potassium, instead of the hyposulphite of soda, as the letters then appear considerably brighter by reflected light. It is desirable that the sensibility of this new method, as compared with others now in use, should be tested by a carefully-made series of numerical determinations.—"O. N. R.," in the *American Journal of Science and Art.*

* Pogg. Annalen, vol. cxiv, No. 9, p. 145.

Entremets.

THE "SENSATION" CAB.

A well-known photographer, engaged in procuring instantaneous London views, once met with a somewhat comical adventure. He chartered a cab, duly blinded its windows with yellow calico, after the approved fashion of his singular race, and fitted up its interior as a very snug little dark chamber, in which he was just esconced, with a newly-exposed plate, when he heard a harsh voice, with a strong Irish brogue, cry—"Will you be afther moving on with that cab!" Move on! There was horror in the idea. Moveables would be jerked over—solutions spilt—the plate spoiled! But cabby, true to his mission, did *not* move on. Then an angry altercation arose, and then a crowd. Just as our photographer was about to put some silver into the intensifier, the Irish voice, evidently a policeman's, was heard close to the door, which he was evidently about to open. Cabby, however, interposed. The crowd grew excited. Who could it be possessed with the singular fancy of sitting in a yellow-blinded cab which was standing quite still. The imagination of the many-headed originated all sorts of wild conjectures, especially when cabby resolutely refused to allow his mysterious "fare" to be seen. At last a figure emerged from the cab, with a hot red face and black fingers, and plunged at once into the thick of the fight raging between cabman and the lettered officer. The upshot was that cab, photographer, boy with camera on stand, cabman, and policeman, surrounded and followed by a constantly-increasing mob, moved on towards the celebrated station known to newspaper-readers as "Bow-street."

Here the matter was settled. The inspector severely reprimanded No. 68 for exceeding his duty, "68" vainly endeavouring to protest against the accusation. The photographer, indignant, was withal somewhat amused; and cabby, grinning deliciously as he looked slyly into the face of the Irish policeman, said, with mock politeness—"Good afternoon, No. 68! Good afternoon!" And still is the cab seen in the most populous London thoroughfares, and still does its mysterious appearance engender all sorts of curious suspicions and suggestions in the gazers which surround it. So much so, indeed, that it already begins to be recognised as the "sensation" cab. R. A. S.

Foreign Correspondence.

Paris, November 26th, 1862.

At the last meeting of the Photographic Society of Marseilles an incident occurred which is all the more interesting as it may, possibly, lead to a better understanding of the mysterious origin of the impression produced by light. M. Jacquemet presented to the Society various pictures obtained on dry collodion with tannin. Some had been developed twenty-four hours after the exposure, others about twenty days after. The first were remarkable for the intensity of the tones, and the strong contrasts—too strong, in fact; the others were extremely weak and flat. The parts which are usually dark, such as the sky and the strong lights, could not, in spite of every effort, be brought to anything but a very pale grey tint. In a word, the pictures were unfit for the printing of positives. As all these plates had been prepared and acted on under identical conditions, it might be concluded that in the tannin process the developing power grows less with the lapse of time; that, consequently, the operation should not be delayed beyond three or four days, and that it is even preferable to develop in the course of the same day. However, in his first experiments on Major Russell's process, M. Vidal had noticed a very different effect. He had even, at one of the meetings of the Society, developed plates prepared and printed on three months previously, and the image obtained had been pretty intense. After M. Jacquemet's communication, M. Vidal explained the seeming anomaly in the following manner:—In his opinion, the phenomenon of luminous impression belongs, not to the chemical, but to the physical order, and of this M. Jacquemet's experiment is a new proof. If there were combination or reduction—even rudimentary—of the iodide of silver, this state would continue, even if it did not augment with the lapse of time: the above facts prove that the contrary takes place. It might, therefore, be more reasonably supposed that, in the parts influenced by light, a certain change is produced; but M. Vidal believes, rather, that the actinic rays are absorbed in a certain quantity by the coating of iodide, which holds them for a time. The fact mentioned above may be explained by these two hypotheses:—Either the iodide of silver, yielding to the general physical law, tends to change back to its former mole-

cular state, as forged iron returns from the fibrous to the granular or lamellate texture; or else the luminous fluid imprisoned (*stored up*, as M. Nièpce says) in the pores of the collodion is gradually disengaged therefrom, as a body once heated and then abandoned to itself gradually loses its caloric.

This change of state, or this disengagement, takes place with greater or less rapidity according as the coating is more or less protected; so that a vitreous substance—a varnish—will, to a certain extent, protect it. The plates which grew feeble after twenty days were only protected by a slight coating of tannin—an ordinary three-per-cent. solution; those which M. Vidal kept for three months were covered with a much thicker solution, for it was saturated with tannin. From these explanations it results that, though by certain means the power of development may be preserved for a longer or shorter time, it yet must at length completely cease. It would, therefore, be an interesting experiment to re-submit to luminous action in the camera a plate formerly printed upon. The sensitiveness would, perhaps, not have been impaired, so that the second image would appear alone, and with great distinctness. M. Vidal's theory would thus be verified. We submit the matter to English experimenters.

The opening meeting, for this season, of the French Society of Photography at last took place on Friday, the 21st of November. By a singular coincidence, three apparatus of similar nature—that is to say, for operating without tent or laboratory—were presented in succession. The first, M. de Poilly's, appeared to us rather complicated: it resembles the portable laboratory of Albites, but is far less simple. The second, due to M. Rousseau de la Faille, is not so complicated. The third is M. Léon Vidal's autopolygraphic camera, the construction of which is known to you. M. Léon Vidal, who is at this moment at Paris, exhibited the apparatus himself. He took advantage of the opportunity to call attention to the permanent Exhibition which will be opened in January next—not in the temporary premises of the Photographic Society, but in the spacious rooms belonging to the *Union des Arts*, which is now completely organised. This Exhibition is not intended merely to present the works of photographers to the attention of visitors; a saleroom will be joined to it, as is the case with the *Comptor International des Photographes*. Apparatus and chemical products will also be admitted on sale. Without neglecting the artistic side, M. Léon Vidal thinks—rightly in our opinion—that commercial interests should not be forgotten. Photography will have its place in the saloons of the *Union des Arts* among the works of painting and sculpture and the select productions of the industrial arts.

I have no need to tell you of the great ideas that M. Léon Vidal seeks to put into execution; you know them from his own communications; but what I may tell you is that they are everywhere receiving a welcome which renders their success certain. At the point at which the great and beautiful discoveries of the Nièpces, the Talbots, and the Daguerres have arrived, active practical men are wanted to turn to profit in the general interest all those magnificent resources which the discoveries offer, so that not any may be wasted. Experimenters, *savants*, and professional men have done their work; it is for men of the class we have referred to to carry it on. The utility of the efforts attempted in this direction is incontestable. Soon I hope to be able to inform you of projects no less important, and all tending to the one end—the widening of the present horizon of the new art. We can hardly give too much encouragement in our journals and books to those who pursue this object, which is also our own.

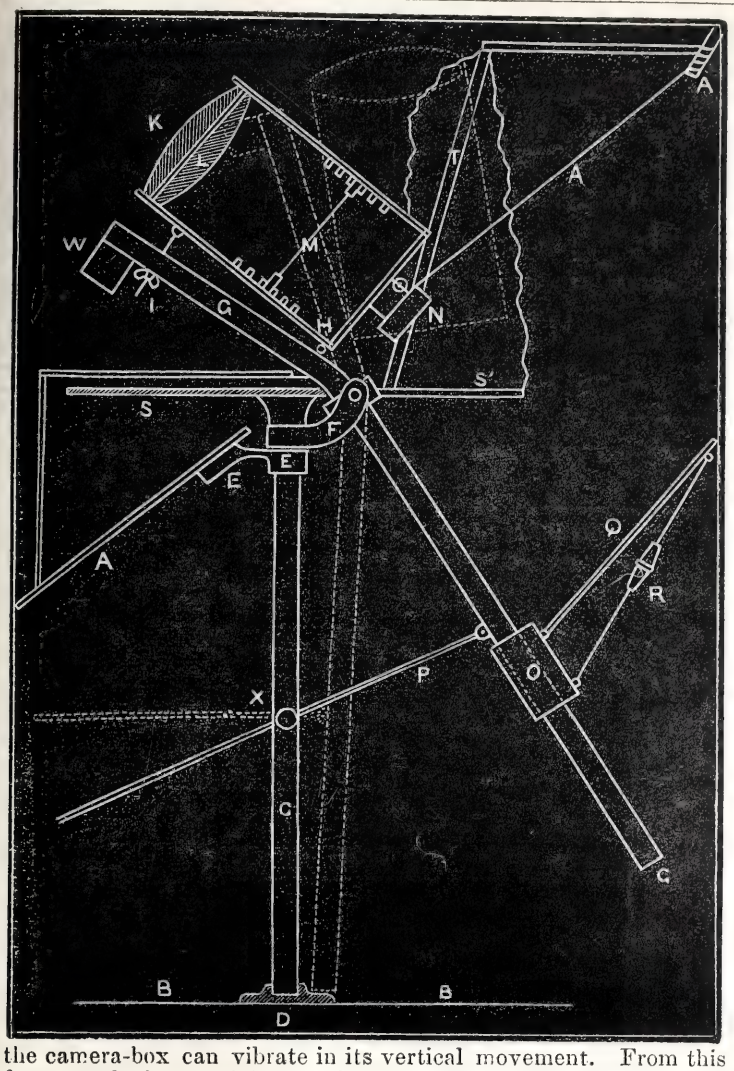
In concluding, I must call the attention of amateurs and artists to a most interesting work which is about to appear—the complete collection of the reproductions of the Campana Museum (Museum of Napoleon III.), executed by Madame Laffon. The album will be issued in two editions—the one printed by the ordinary processes, and the other printed from photolithographic plates by Poitevin's process at Lemercier's offices.

ERNEST LACAN.

Philadelphia, November 3, 1862.

In several of my letters to The British Journal of Photography there have been promises to send specimen prints as illustrative of what the solar camera can do in the hands of American photographers. This promise is now to be fulfilled; for, by the steamer which conveys this letter, a package will be forwarded by Messrs. Broadbent and Co., of Philadelphia, to the Editor, containing pictures produced with their new solar camera, as arranged by Mr. Wenderoth; and, in view of the opportunity of having my description thus vouched for, I must be excused for devoting most of this letter to the subject. Mr. Wenderoth has kindly consented to allow me to publish an exact account of his camera, and has given me most valuable information regarding its peculiarities. A great fault with these instruments has been a tendency to produce a solarised spot in the centre of the field, which could only be corrected by using small stops, and thus shutting out most of the light. The large condensing lens which was said to be achromatic caused this fault, but it showed not only one but two bright spots on the field. As blisters began to appear in the cement between the glasses Mr. Wenderoth determined to separate them. To do this he placed the lenses in a large boiler in cold water, gradually heated this until the water boiled, then, taking the lens by one edge, the glasses slid apart. The first one was laid on the carpet with care; the second one having had a mass of resin cemented to it in a former experiment of separating them, this resin was now in an almost fluid state on the surface, and he attempted to scrape it off with a knife, but as soon as the cold steel touched the hot glass the lens cracked to pieces. This left him with only a single plano-convex lens; but he had also a plano-convex lens belonging to another pair, which had conjointly been of twenty-four inches focus, while the broken pair had a focus of twenty-two inches. In the extremity of his case it occurred to him to use these two plano-convex lenses in combination temporarily by putting their plane faces together, separating them about one-sixteenth of an inch. Their focus combined proved to be twenty-two inches, *i.e.*, in the solar camera as it now is. The distance from the centre of the condensing lens to the front lens of the copying-tube is just twenty-two inches.* This new arrangement of the condenser has done away with both of the solarised spots, and Mr. Wenderoth now prints with the whole opening of the copying-tube. It had been his intention to try a suggestion of his lens-maker by using two plano-convex lenses with their convex faces almost touching, but his "fortunate misfortune" has given him probably the best arrangement of condensers. He considers a short-focus condenser of the utmost importance—first, because it works quickly; and, secondly, because it enables him to use larger negatives to print from with less heat to the negative. The distance of the negative from the copying-tube varies but little, and with long-focus condensers the circle of illumination at the place fixed for the negative is smaller than the circle of light from a short-focus condenser at the same point. In his present instrument he uses two-thirds size negatives, made on whole-size plates; or, in other words, the circle of illumination covers only that part of a whole-size plate equivalent to a two-thirds size picture. The plates are not much warmed by the printing, and never break in his hands. This plan of short-focus condenser is quite universal in America, and for the reasons specified. I have before stated he uses no reflector, and, consequently, can print from more dense negatives than if a reflector was used. It is no easy matter to describe in words how intense; but they are much more so than glass positives, and almost strong enough to print on ammonio-nitrate paper in diffused light. Such a negative is printed to the full size of the ordinary sheet of Saxe paper in three-quarters of an hour, while many prints but little smaller than this are printed in thirty minutes. In the annexed cut A A A is the pitch of the roof; B B the floor of the room; C is an iron column made of two-and-a-half inches wrought-iron gas pipe, supported on the floor in a cast-iron socket D, and to the roof by a wrought-iron bearing E. The column can turn on its axis in these bearings with ease. Above the bearing E is a forked arm F, furnished with two steel centres, between which is suspended the pipe G G, also two-and-a-half inches diameter, and bent at the point F so as to form an obtuse angle. To this pipe at H is hinged the camera, and I is an adjusting screw to raise and lower it. K L are the two condensing lenses, M the negative in its rack, and N the copying lens. The lower end of G has a feather running its whole length, fitted into a groove in the sliding collar O. This collar is open on its lower side, so as to pass over the rod P. The collar O carries the printing platform Q, which is hinged to the collar, and has a brass rod R behind in it with a double right and left hand screw to lengthen and shorten it, and so make the platform square with the axis of the lenses. At the top of the column C is a three-quarter circle or disc of wood S and S', open at S' to allow the rays to reach the screen, and having a rectangular frame T attached to it, through the opening of which

* There is evidently an error in our correspondent's description of the condensing lens; for if the two pairs of lenses were *achromatic* it is not probable that they would have been composed with *plano-convex crown lenses*. Moreover, if the achromatic combinations had been of twenty-two and twenty-four inches focus respectively, the convex lenses of each pair when *alone* must have been of shorter foci than those quoted, and when combined little more than half that of the shortest. We suspect the error to consist in the assumption that the original condensers were achromatic, when they were not so. We find on perusing the letter further that our correspondent is doubtful on this point.—Ed.



the camera-box can vibrate in its vertical movement. From this frame to the box, and from an iron rod above it (not shown in this cut), is attached a flexible black cloth, excluding all the light from the room, but allowing perfect freedom of motion to the instrument. The dotted lines show the portion of the instrument as presented to the noonday summer sun. W is a counter weight of lead to balance the long end of the pipe G. The rod P runs through a swivel joint at X, and is clamped with a set screw; the straight rod has been found to be better than a quadrant. There are shutters outside to close over the instrument when it is out of use. The condenser now in use is sixteen inches in diameter and twenty-two inches focus; and, although there are two glasses forming the lens, it is not achromatic—and I may have been mistaken as to the former one having been achromatic, although Mr. Wenderoth called it so. Among the specimens sent is a life-size portrait of General Nagle. This will do as a sample of that kind of enlarging; while some prints, intended to be coloured, will show a style of picture Messrs. Broadbent and Co. produce in large numbers. Those sent were intended for show in their rooms, the portrait being of one of the young ladies from their painting room. The subject of one is the *Masque*. The lady stands with her mask in hand near a column and railing, above which is a blank white space. This space is to be filled, in painting, by an open window, through which will stream the soft light of the moon. To the left is an arm-chair, over which is thrown her cloak; while ornamental objects make up the furniture of the room. The high lights on the figure next to the room will be accounted for by lamplight from within overpowering the more feeble moonlight, and throw the shadows towards the open window. In the second picture the lady is seated near what is to be a window, and the accessories of the picture are fruits and flowers. These will show what amount of sharpness the solar camera can effect.

Messrs. Broadbent and Co. send also an albumen print, varnished with the peculiar white varnish used to cover their Wenderotypes, and I hope you will be able to tell us its composition. The equestrian figures on albumenised paper are printed direct from negatives intended for the solar camera, but which were found to be too intense. These negatives are to be placed against white enamelled glass, and glass positives are to be taken from them, while from these positives new negatives of proper intensity are to be produced. This class of work gives constant employment to one operator, who is thus making negatives for the solar camera from small card-picture negatives. Their equestrian pictures seldom have the portraits of the ladies taken at the same time as the landscape. Usually the landscape and horses are taken first; then the ladies, in riding costume, are taken at the gallery, and are printed into the picture standing, the horses and houses in the background. Sometimes many figures are thus printed. This class of work has been a speciality with Messrs. Broadbent and Co. for years.

It gives me pleasure to know that these examples of American work will soon be where our English friends can see them, and I hope they will afford them some pleasure. In the package will also be included some copies of drawings and machinery, by Mr. Hemple, of Philadelphia, and a few by your correspondent. I send also, per mail, several stereographs of dogs, cats, &c., photographed by Mr. J. Dickenson Sergeant, of Philadelphia, who is one of our amateurs of great promise. He is one of the few who act on the maxim that it is best to keep only the very good pictures and wipe out all the medium and bad ones. Professor Emerson's return to America has taken us quite by surprise, and it is with regret we hear that it is domestic affliction that has brought him home.

Mr. Walker, the photographer of the treasury department, Washington, called to see me some days ago, and gave me very many items of interest, all of which must be laid by until next letter, as this has already taken up too much space.

COLEMAN SELLERS.

[We have received the packet of specimens kindly forwarded by Messrs. Broadbent and Co., together with a communication from Mr. Wenderoth, which shall appear in our next, after we have had an opportunity of exhibiting the photographs in public. We shall probably make some comments on these pictures.—Ed.]

Correspondence.

☞ **We are at all times willing to assist our Correspondents to the utmost of our ability, but we can only do so through the medium of the Journal. We cannot give private replies except to personal friends.**

A GOOD EXAMPLE.

To the Editor.

Sir,—I herewith send you four specimens of my doings this season by my old cherished Fothergill process. I certainly did intend to send you more, but have got short of prints, and now we have most impracticable weather. Your favourable review last season has acted as a considerable spur to me during this one. It is for you to judge whether any advance has been made. For my own part, I am a long, long way short of being satisfied, though I know that the work is better since you gave me an overhaul some three seasons ago.

Perhaps my kit of apparatus might be interesting to you, being probably as light and compact as could well be; and a photograph of the same is enclosed with the stereoscopic slides. The case measures 14 × 9 × 6 inches; contains double-bodied camera, with extra rising front; table; twelve double slips, carrying twenty-four prepared plates. Each slip is only half-an-inch thick, the shutters being made of milled-board, well varnished, the division between being also of milled-board. One-half of the slip has a tongue planted all round, which fits into a corresponding groove in the other half, so that they are perfectly impervious to light. Many times have I had them lying unprotected on the grass under a blazing sun. You will observe that the case is provided with shoulder straps; and you may judge of the weight when I mention that not unfrequently has it been my shoulder companion during a thirty-mile tramp per day among the Scottish hills and glens—this, of course, being the maximum of all photographic pleasure.

During my leisure evenings in the winter time the above and similar apparatus have been constructed, and, knowing that the burden was for my own back, good care was taken that nothing superfluous should be admitted. The stand, when fitted up, is round, four feet three inches long, and bound by a pair of leather ferrules.

Dunkeld Cathedral was taken with Grubb's seven-inch aplanatic, the *Ferns and Cascade* with Ross's four-and-a-half inch single, and the *Marine View* with Ross's double, stereoscopic lenses. I have been working hard for instantaneous dry plates.

I fear I am trespassing on your patience, so will conclude.

I am, yours, &c., J. L. P.

[We have no doubt the description of your apparatus will be useful to many of our amateur readers. Your productions are truly excellent. We can honestly compliment you on your success, and affirm that there are but few professional photographers who can surpass you in skill.

You have also certainly made great progress towards an instantaneous dry process. The clouds in the views of *Dunkeld Cathedral* and the *Harbour of Montrose* are very good indeed; and the former, especially, is a charming picture. We perceive you have taken it from the opposite side of the Tay. Should you try it again, you will find another capital point of view from the bowling green, near to an old summer-house—which, by the way, if the Duke were a photographer, he would be sure to convert into a photographic room. The *Falls of Glendovan* might possibly have borne a shade more of exposure with advantage, but the picture is very good. We are quite in raptures with the mass of ferns against the lichen-clad tree trunk, and grasses, and mallow leaves, and what not.—ED.]

STAINY NEGATIVES.

To the EDITOR.

SIR,—Will you be kind enough to tell me how to remedy the following defect? You will perceive a mark or two on the paper enclosed, which has a corresponding mark on the negative. I use ———'s collodion, a glass bath and dipper, and the bath solution is made from the formula of the manufacturer of the collodion. I can get beautifully clean negatives for about a couple of days, and then the stains begin to appear. I have tried several new baths with the same result. I can see the stain marks on the plate before exposure. Is the bath too acid or alkaline? or is it a stain produced by organic matter?—An answer in your impression of the 1st will oblige, yours, &c., J. A. H.

[The stains are certainly due primarily to an absence of *perfect* cleanliness in the plates; but if the bath solution were not at fault also, the stains would probably not appear. We have no practical acquaintance with the collodion you mention; but from the appearance of the stains, as shown by your proof, we should judge that the bath solution had become deteriorated by the introduction of methyl, and this could only be derived from the collodion, which may be made with methylated ether. To judge of this the simplest way is to let a few drops fall on your hand, and, on evaporating, the scent will generally betray whether methyl is present or not: if not, the ether has a cool odour resembling oranges; but if the ether is methylated there will be, in addition, an empyreumatic *tarry* scent, which will force itself on your attention. We advise your trying a sample of some other collodion in the same bath. That will show whether the bath is at fault; and if that be so, it is of no use to add acid, but you had better render it alkaline by the addition of ammonia, expose it for some hours to full sunshine, let the deposit subside, and then filter it; lastly, very slightly acidify it. Let us know the results, and if you are still at fault we will try and suggest some further proceedings based upon them.—ED.]

ADHERENT COLLODION.

To the EDITOR.

SIR,—I can recommend your correspondent, "Brighton," a trial of Perry's bromo-iodised collodion, which is advertised in your Journal to be obtained from Messrs. G. Knight & Co., 2, Foster Lane, and Mr. J. Solomon, 22, Red Lion Square. He will find it stand almost any amount of developing and washing without any signs of leaving the plate.

I have only used it myself for dry plates.

I am, yours, &c., AN AMATEUR.

P.S.—No previous coating will be required.

AVOIR-*du*-POIS.

To the EDITOR.

MAISTER EDITOR,—Wull ye be sae varra gude as inform me, and, dootless, in doin' sae ye wull be enlichten in ither ignoramuses like mysel', what number o' grains or drachms mak an ounce o' silver? Whan I was a laddie, at schule, I learned that, by 'Pothecaries' weight, one drachm was sixty grains, an' eight drachms made one ounce; an' by Troy, that twenty-four grains were equal to one pennyweight, an' twenty pennyweights one ounce. Noo, as 60 multiplied by 8 maks 480, I opine that 24 multiplied by 20 is jist the same thing, sae that, whether by 'Pothecaries' or Troy, I should get 480 grains o' silver when I buy an ounce.

But I find I maun gang back to the schule again, unless you in your gude natur (an' I ken ye hae plenty o't) wull answer the question, as I find I am a' wrang; for, the ither day, I bocht twa ounces at a grand establishment in London, an', on getting hame, I weighed it out *maist carefully*, in twa drachm quantities; an', wad ye believe it! I only got *five* weighins, or 600 grains!!

Noo, I dinna mean to say the chield cheated me; na, na, that wad be "Jeddart justice"—which, ye ken, was first tae hang the puir deevil and then try him—sae I mean to resarve my verdic' until ye kindly answer this screed; and with boos an' apologies for gien ye a' this trouble,

I am, yours, &c., LOCHABER.

P.S.—If ye are verra busy an' have not time to answer yoursell, maybe my learned countryman, Maister Dawson, at King's College, wull tak the trouble aff your han's.

[We are informed, in a private memorandum, that the assertion made in the above about the weight of nitrate of silver sold to the writer as being *two ounces* was found to be as quoted. Our correspondent forgets that chemicals are sold by avoirdupois weight, and therefore he should have had but 437½ grains to each ounce, and not 480 as he appears to suppose.—ED.]

ANSWERS TO CORRESPONDENTS.

MARSEILLES PHOTOGRAPHIC SOCIETY.—The report of the last meeting of this Society has reached us too late for insertion in the present number.

JACOBUS.—Already answered.

SECUNDUS.—We have no doubt that you will find plain paper best for proofs of so large a size as 22 by 16: it is also less costly.

C. RUSKIN.—We perceive that the globe lenses of Harrison's make are now "in the market," and have no doubt that you can procure them from Mr. Atkinson, of Liverpool.

DARK ROOM.—We cannot at all endorse your opinion on the point insisted on in you letter, and we do not perceive any utility in inserting it merely for the purpose of controverting your views.

F. ROVER.—We prefer a number of double backs to the best changing-box that can be made—partly because they are less troublesome to use and but little or not at all more costly, and partly because they are generally lighter to carry, no more than you are likely to use on any one day being necessary to take out. See letter of J. L. P.

W. S.—1. The collodion you name in your second query will do for the tannin process. See also a note from "Amateur" in this number. 2. We do know the collodion you name, and it is very good for dry processes generally; but we by no means consider it better than that of several other makers. 3. The same bath will do.

E. B.—The animal you enclose to us does not bear the slightest resemblance to an *Acarus*, but is a very common kind of beetle—small for a beetle, but large as compared with the general run of *Acari;* which, by the way, you will be best able to recognise when we tell you that cheese mites belong to the tribe. We have an article in MS. on the subject of your second inquiry waiting its turn for insertion.

AMATEUR.—We have no fewer than three letters with this signature only—two of them being on the same subject and dated from the same town in Yorkshire; the third has neither date nor locality named. We are rather puzzled to distinguish between them so as to avoid confusion, but we must endeavour to do so. First, in reply to the *dateless* one: the collodion you name is good, and well fitted for dry-plate work; but we cannot assert that it is the best in the market, nor even the best in our opinion with which we are acquainted. Our other two correspondents who hail from Yorkshire we will reply to under the *two last* initials on the cards enclosed.

C. RULE.—Your queries are certainly rather heterogeneoous; but we will endeavour to reply to them *seriatim*. 1. We are not aware of any fixing agent for paper proofs that can supersede the use of hyposulphite of soda, except it be ammonia, and the volatile nature of, and disagreeable effects produced by, this substance prevent its general use. 2. With stops of equal sizes in front of the lenses, and provided that the *scale of the image* be equal in both cases, the double combination lens *must* be slower in action than the single one, because of the greater amount of absorption, and, what is still more serious, the greater number of surfaces. 3. A member is entitled to free admission, and personally to introduce one friend. 4. The firm you mention is a highly respectable one. 5. See advertisements.

R. F.—The card-portraits received are of very different degrees of merit. No. 1 is not badly posed, but the printing is defective, being flat and mealy: there is a want of sharpness about the lower part of the figure, owing, most likely, to its having been taken by a lens not constructed for the purpose. Nos. 2, 3, and 4 are stiff and awkward in attitude, but better printed—the background of No. 3 being good, the others indifferent. No. 5 is decidedly the best of the lot, being well posed, well taken, and very fairly printed, though a trifle too pale in tone. Nos. 6, 7, and 11 are hopelessly bad; 8 and 10 full of spots and comets; and No. 9 afflicted with measles. Of course they are taken by several different hands, though you do not say so; but it is sufficiently evident from the peculiarities of style.

J. C. & B. W.—For information generally about building a glass-room, see Mr. Wall's "Chat," p. 328, *et seq.* of the current volume. J. C. quotes twenty feet long by eight feet wide as his maximum space available. Our advice is to have as much glass as possible on both of the longer sides and over the whole of the roof, with blinds to shut in either side at will, and a white blind over the sitter's head that can be drawn forward or backwards (by means of cords) from the further end of the room. Your dark-room is best to be at the end, opposite to your sitter. See articles by Mr. McLachlan, pp. 227 and 274 of the current volume. Any special queries we shall be happy to answer, but we have not space to go into all the details required in this column without first knowing in what your doubts consist.

☞ *All* EDITORIAL *Communications*, BOOKS FOR REVIEW, *&c., should be forwarded to the Editor*, GEORGE SHADBOLT, 2, *Upper Hornsey Rise, London, N.*

All ADVERTISEMENTS *and* LETTERS *on the* BUSINESS *of this Journal to be addressed to the* PUBLISHER, 32, *Castle Street, Liverpool.*

NOTICE.—Orders for this Journal sent through Provincial Booksellers to their London Correspondents, ought to ensure its delivery in any part of Great Britain and Ireland on the day of publication. The London Wholesale Agents are E. MARLBOROUGH & Co., 4, Ave Maria Lane, E.C.—When any difficulty is experienced in so procuring it punctually, the orders should be sent direct to the Publisher, 32, Castle Street, Liverpool.

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THE BRITISH

JOURNAL OF PHOTOGRAPHY.

No. 180, Vol. IX.—DECEMBER 15, 1862.

The British Journal Photographic Almanac for 1863.—In reply to numerous inquiries, we beg to announce that the Almanac for 1863 is nearly completed, and that a copy will be Presented with every Copy of this Journal issued on the 1st January next. As usual, it will be on sale to non-subscribers at the nominal price of Threepence per copy.

We are pleased to find that at each annual issue this *brochure* finds increasing favour with the recipients. We shall endeavour to make the forthcoming Almanac increasingly valuable by the introduction of several new features. Among its contents will be found, besides the usual Calendar for the year, "A Retrospect of our Photographic Year;" Days, Hours, Places of Meeting, and Officers of Photographic and Scientific Societies; Formulæ for Wet, Dry, Instantaneous, Negative, and Positive Collodion Processes; Waxed-Paper Process; Printing Process; Analytical Observations and Tables; a Polyglot Label for Dry Plates; Consumption of Silver Salts, and Saving which may be Effected; Paper on Transparent Positives; Lighting and Ventilation of Glass-houses; Lighting and Posing the Figure; New and Useful Tables, Measures, Notes, &c.; and a large amount of other important and interesting information.

To avoid interfering with the portability of the Almanac, the space devoted to advertisements will of necessity be limited. We are therefore requested by the Publisher to intimate to those wishing to take advantage of so desirable a medium for permanently advertising, that early application for space will be requisite, in order to avoid disappointment and ensure insertion. The period during which advertisements can be received is now limited.

Further particulars will be found at page iv. of the advertising sheet.

Epilogue.—At the close of our last volume, in our valedictory address, we accidentally employed in a metaphorical sense the words "battle and war;" and although we were immediately struck with the fact of their being apposite to the political aspect of affairs at the time, we scarcely surmised that they would have been so prophetical of the condition of our art during the past twelve months as events have since shown that they were. The battle of South Kensington was then in progress, but as the month of May approached the Royal Commissioners succeeded in establishing more firmly their iron despotism over the followers of our craft; and it was not until the latter found how bitterly they had been deceived, and how ignominiously their productions had been banished to the inhospitable regions of the central tower, and associated with a mass of children's toys huddled together in almost hopeless confusion, that the cry of indignation again made itself heard. But then dire wrath abounded amongst the British exhibitors in Class XIV.

It must be admitted that photographers, as a body, do *not* form a happy family; indeed we do not well perceive how they should do so, the guild being composed of such heterogeneous elements with opposing interests, and regarding the canons of their art from such totally different points of view. Litigation in connexion with photography commenced early in the year, and from time to time has been the subject of comment in the pages of the daily press, as well as of those devoted especially to a record of the doings of the disciples of the sun and the nitrate of silver bath; in fact, several important actions have been tried, to say nought of minor squabbles.

Some of our photographic societies have been in trouble from internecine warfare, and that to an extent which in one instance compassed moral suicide of the body corporate, while others have been reduced to a state of collapse.

Photographic literature, as our readers well know, has been anything but free from the "pomp and panoply of glorious war," as the poet expressed a state which he evidently knew very little about, or he would have selected some more appropriate epithet than—glorious. That there should have been rival claimants for photographic honours—much advocacy of certain views *versus* certain other views—much difference of opinion on things indifferent, is not to be confounded with warfare: this implies only healthy activity. But the contests on questions of moral interest—the obliteration or ignoring of the boundaries between *meum* and *tuum*—are the real symptoms which betray the fact that dissention has been strong in the camp. We had trusted that the now rapidly approaching time when most in our land look forward to festivities and exchange of goodwill and genial sentiment, might have brought with it a cessation of hostilities, but find in this we have miscalculated. Though there be too much of distress in the land to enable us to wish our readers a merry Christmas, we may heartily wish them a happy one, and express a hope that ere long "the hatchet may be buried," and that the forthcoming year may be mainly one of—Peace and Goodwill.

A few words more ere we bring our present remarks to a close. We have laboured diligently to lay before our readers, promptly and succinctly, all that has occurred in connexion with our art in which we have judged that they would take an interest; we have carefully selected pabulum suited to all classes of them; we have sought the assistance of those who could aid us in our work, whether they have been regularly associated with us or not; we have organised a complete staff of foreign correspondents, in order that our readers may be well advised of all that is taking place in connexion with our favourite pursuit in all places where it flourishes; we have endeavoured to afford information and assistance to all requiring either at our hands; we have watched for the special demand of the hour, and have endeavoured to meet it; and we have substantial reasons for believing that our labour has not been in vain—a conviction which is the best guarantee that our exertions will not be relaxed for the future. Let us therefore assume for our next year's motto—"Onward and Upward."

Acari in the Nitrate Bath.—In our last issue we gave some account of the result of investigations relative to the origin and history of the *Acari* found by Dr. Maddox in a bath solution of nitrate of silver that had been out of use for some time. We have just received our copy of the *American Journal of Photography*, in which we find that Col. Pike has discovered some minute animals in his nitrate bath, and has read a paper on

the subject before the American Photographical Society, which we reproduce at page 473. The account given in the paper of the appearance of these animals leads us to the conclusion that the author is not a practised microscopical observer; and the only apparent reason for assuming that they were *Acari* consists in the fact of their having eight legs, otherwise *Acari* are not in the habit of *darting* across the field of the microscope, their gait being regularly progressive. There are also some other details of description which do not tally with the appearance of *Acari;* but this may arise from the observer's want of familiarity with both microscope and object. The author says—"I at once concluded that they were species of *Acari;*" but not a word about their having been previously discovered "in the old country" in such an anomalous position. We notice that a photo-micrograph of one magnified five hundred diameters was exhibited at the meeting. We shall endeavour to procure a copy by the aid of friend Coleman Sellers. Either Col. Pike is not happy in his description of the animal, or else there must be another kind than that already noticed by Dr. Maddox capable of resisting the corrosive action of nitrate of silver. In either case it will afford much interest to compare the two.

M. Tissot's Instantaneous Shutter.—We perceive by a description and illustration of this piece of apparatus, published in *Le Moniteur de la Photographié* for the 1st instant, that it is identical in principle, and nearly so in construction, with that originally introduced by Mr. Montefiore Levi, which was figured and described in the first vol. of the *Journal of the Photographic Society*, and which has been more recently patented by Mr. Mann (of course invalidly). The only material difference introduced in M. Tissot's arrangement is, in our opinion, an objectionable complication—the opening and closing of the aperture of the lens being effected by a reciprocating movement of the shutters, while Mr. Levi's arrangement effected the opening and closing by a single movement in one direction of each pair of shutters. It is odd that such a contrivance should have been published since 1853, and be rediscovered nine years afterwards by two so widely located individuals.

A New Ally.—In our next we shall have much pleasure in introducing to the notice of our readers an original paper *On the Spectroscope* from the pen of Professor Ogden N. Rood, of Troy University, State of New York, one of the most accomplished writers in the United States of America upon optical questions, and a frequent contributor to the pages of Silliman's *American Journal of Science and Art*. The communication to hand will be followed by others, from time to time, by the same accomplished author.

COAGULATION OF ALBUMEN.

A writer (Mr. George Price) in the pages of our contemporary, the *Photographic News*, has recently thought fit to make an unprovoked and malicious attack upon our valued contributor, Mr. George Dawson, Lecturer on Photography at King's College, London—the former having been aided and abetted in so doing, if not instigated thereto, by the editor of the publication to which we have alluded. What offence Mr. Dawson has committed against Mr. Price, we are at a loss to divine. We admit that he has to the editor of our contemporary committed the unpardonable one of becoming a pretty constant contributor to our columns, besides having upon one occasion, in a quiet way, resented an impertinent aggression on the part of the said editor, who took upon himself to "apologise" for the inadvertent promulgation of an (imaginary) error in chemistry, alleged to have been committed by Mr. Dawson. The refutation occurred in an article headed "A Lesson to the Learned," and which may be found at p. 351, by the perusal of which our readers will perceive that there was not the least foundation for the accusation of error.

In the present instance Mr. Price himself raises the giant which he subsequently proceeds to demolish—a harmless, if unprofitable, occupation. But, in so doing, he casts the imputation of ignorance of chemistry and the promulgation of error upon a public photographic teacher. That Mr. Price is abetted by his editor in this attack will be sufficiently apparent from the following words, namely, "But Mr. Price attacks a special error promulgated by one who has laid himself open to special correction," which we quote from the editorial leading article of the *Photographic News* of the 5th instant.

Happily Mr. Dawson's well-established reputation for careful experiment and general accuracy of statement precludes the necessity for any notice of such imputations on his part, and we think he does well in allowing such an attack to pass by him "as the idle wind which he respects not." But with us the case is far different: we have a duty to perform, in resenting an indignity put upon one of our contributors, knowing full well that he has been subjected to it chiefly, if not entirely, *because* he is our contributor. Mr. Price has been engaged in discussing certain statements made by the Abbé Pujo in connexion with the combination of albumen and oxide of silver; and in the number of the *Photographic News* already quoted has procured insertion of a letter headed "The non-coagulation of dried albumen and Mr. Dawson"—referring to that gentleman's paper read at the North London Photographic Association, and published in our impression of 1st November last, p. 402 *et seq.*, and which paper we commend to our readers for reperusal. After quoting four lines of the article Mr. Price says:—

"Now I am old-fashioned enough to think that he who takes upon himself the office of teacher and lecturer should so write that the reader should never be in doubt as to what he means; but the passage I have quoted is so obscurely worded as to be wholly unintelligible to those who, like myself, do not know beforehand what meaning Mr. Dawson intends to convey."

Mr. Price omits a few important words in the article which stood just before those he quotes, the omitted words being—

"I shall not enter into this part of my subject in detail at present, as it is still under experiments requiring time for their completion."

To Mr. Price we might reply that it is surely enough for a writer to find matter, without finding brains for his reader; but in the case before us we believe presence of malice rather than absence of acuteness to form the impediment to a correct understanding of the phrase employed. But further we assert that, if there were any obscurity in the statement which Mr. Price quotes (which we do not admit) there is a sufficient reason given in the words omitted by the latter to justify it. Moreover, Mr. Dawson does *not* take upon himself the office of teacher and lecturer; but was elected and appointed thereto after a rigid scrutiny into his qualifications by the authorities of King's College, who are generally pretty careful in appointing as teachers only those who do credit to their judgment.

We next come to the following paragraph in Mr. Price's letter:—

"As experiments in a test-tube upon coagulated albumen can afford no information respecting the 'causes of fading of photographs,' I cannot but suppose that Mr. Dawson's 'experiments completed so far' refer to albumen as it is found on a sheet of albumenised paper, viz., in its *dried* state. If this supposition be correct, we have him assuming a fallacy to be a fact, and promulgating it as such; this is, in fact, tantamount to his assertion, in broad terms, that there is no fallacy in his assumption; and thus he is *mis*-teaching the rising generation of photographers."

We would inquire, in the first place, how Mr. Price can possibly prove that experiments in a test tube can afford *no information* respecting the causes of fading of photographs? We have good reason for believing that the contrary is the fact. Secondly, we would point out that Mr. Price's supposition is a purely gratuitous assumption, so far as anything that appears in Mr. Dawson's paper is concerned: there is not a statement therein, from beginning to end, which can in any way justify the imputation of Mr. Dawson's supposed ignorance of the fact that *dried* albumen is not coagulable by heat—an imputation

forming the burden of Mr. Price's letter, culminating in the following :—

"As Mr. Dawson's promulgation of the possibility of coagulating dried albumen by heat can only have arisen from 'imperfect knowledge,' in consequence of not having investigated the subject, I trust that when he has done so, and is thus better informed, he will have the candour to acknowledge he has been in error in giving credence to such a fallacy; for I am sure he needs not to be told that where 'dragons and chimeras, in the shape of false doctrines and misconceptions,' are concerned, *the suppression of truth by 'a photographic teacher' is equivalent to the dissemination of error.*"

We are well aware that, amongst photographers but little acquainted with chemistry, the knowledge that dried albumen is not coagulable by heat is wanting; but there are few (if any) chemists ignorant of the fact. There is, however, some obscurity even amongst chemists in the definition of what constitutes *coagulation*, many regarding the coagulation of albumen to be evidenced by its insolubility, and employing the terms "coagulated albumen" and "insoluble albumen" indifferently. We may instance Mr. Keene, who, in an article which appeared in our last, when comparing the behaviour of tannin and gum in contact with nitrate of silver with albumen under the like condition says—"For, unlike albumen, they are not coagulated." Again in the edition of Brande's *Chemistry*, recently published, edited and enlarged by Dr. Alfred S. Taylor, we find the following under the head "Albumen :"—"It is insoluble in, and precipitated by, alcohol. It appears to be converted into *coagulated* or solid albumen by this reagent, *as it is no longer soluble in water.*" Further: almost all writers on the subject specify "coagulation by heat" as if in contradistinction to coagulation by some other agency. Now what is coagulation? We find one definition to be "the solidification of a liquid without evaporation and without crystallisation." Admitting this to be a sound definition it would follow that a strong solution of gelatine becomes coagulated on cooling—an opinion to which we could not assent; and the idea of coagulating dried albumen could not, under such a definition, have been entertained for a moment.

From simple perusal of Mr. Dawson's paper, we were convinced that he did not entertain, much less promulgate, the doctrine of the possibility of coagulating *dried* albumen by the agency of heat; but in order to make clear to others that which was abundantly clear to us, we wrote to Mr. Dawson, requesting him to furnish us with detailed particulars of the experiments to which allusion was specially made, and while in the act of writing these last words we are in receipt of his reply, which, in conclusion, we take the liberty of inserting without consulting him on the point, and at the same time underlining a few words which he has not so treated :—

KING'S COLLEGE.

MY DEAR SIR,—Yours just received. I have not a copy of my paper by me, but by reference to it you will be able to see what expressions I used I tried to express as tersely as I could the result of some experiments which took a long time and considerable care to perform and confirm. From my laboratory notes I send you this short record of proceedings. I think I mentioned in my paper that I tried different samples of paper, to see whether the existence of silver in the whites of a finished print might not be attributed to that source and not the albumen. I afterwards tried albumen *per se*, in its different states,—coagulated, dried, and moist. 1st. The coagulated: the albumen was *slices from a hard-boiled egg*, placed in nitrate of silver, then washed, plunged into very strong hypo. for twenty minutes or so, and finally washed for many hours in running water. The hydrosulphate of ammonia test was then applied, and showed that the hyposulphite of soda and washing had not removed the whole of the silver, although it could not have been acted on by light, having never been out of the dark room. 2nd. The dried: This was albumen dried at a low temperature, and treated precisely in the same manner. 3rd: The liquid albumen was poured into a glass, precipitated by nitrate of silver, thoroughly washed in a filter, through which strong hypo. was passed several times, and it was then thoroughly washed and tested. Similar experiments were performed, using ammonia and cyanide of potassium as the fining agent, with the same results—always the indication of the presence of silver; and, lastly, a slice of the white of hard-boiled egg was put through all the manipulations, excepting treatment of silver, and showed no symptoms of the presence of any metal by the hydrosulphate of ammonia test.

Very truly yours, GEO. DAWSON.

THE NEW RAPID DRY PROCESS.

By ALFRED KEENE.

SINCE sending you the account of the rapid dry process obtained by applying the preservative—gum and tannin—direct to the sensitised plate, and then well washing, I have tried the pyro and ammonia developer, but with very indifferent success. It causes the picture soon to start out even with a short exposure, and also to fog considerably under the subsequent action of the ordinary developer: this latter in a less degree when a collodion containing only a small proportion of bromide is employed, but with its use sensitiveness is so far lost that all advantage of the developer as compared with extra bromo-iodised collodion and ordinary developer is lost.

Some plates I have prepared with very dilute preservative, *with* and *without* an India-rubber substratum (those without having nothing more than an edging of albumen to hold the collodion), indicate that the India-rubber itself plays an important part, the plates prepared *without* the latter having no trace of a picture with the same exposure that gave a fair outline *with* it.

Albumen, I find, does not answer in lieu of India-rubber, decomposition evidencing itself under the action of the developer. I have not yet tried gelatine and similar substances, but should look for the same result from them.

I find the mucilage first employed had become acid, and worked better than fresh. I have since used it with the addition, separately, of acetic, formic, and citric acids, preference being given to the two former—the acetic appearing to give the cleanest, and the formic the most sensitive results.

Much yet remains to be ascertained respecting this process. The very unfavourable weather for photographic experiments, and the limited time my other engagements permit me devoting to this subject, have prevented me following it up as I could have wished; but I purpose embracing every opportunity of doing so, and hope others will also be induced to take the matter up, so that it may be thoroughly investigated.

OUR WEIGHTS AND MEASURES FROM A PHOTOGRAPHIC POINT OF VIEW.

By GEORGE DAWSON, M.A.

Lecturer on Photography at King's College, London.

IN THE BRITISH JOURNAL OF PHOTOGRAPHY for December 1st a correspondent writing in the original Doric, under the *nom de guerre* of "Lochaber," indulges in a few observations which would seem to imply dishonesty on the part of the chemist who supplied him with his nitrate of silver, and which at the same time display on his own part a want of knowledge (natural enough in any one who has not made the subject a particular study) of our very capricious and absurd tables of weights and measures. The ordinary and, indeed, the only legal practice of the "trade" is to buy and sell their chemicals by avoirdupois, while custom and the authority of the pharmacopœia compel its members to compound or dispense them by apothecaries', weight. "Lochaber" was therefore legally entitled to 875 grains when he purchased and paid for two ounces of nitrate of silver. But if he, in his desire to test the honesty of the tradesman, chose to weigh the sample by five different weighings (probably giving at each time to himself the "turn of the baulk," on a two-and-sixpenny pair of scales and with coarse weights), it is not surprising that 600 instead of 875 grains should represent his two ounces. I am not a strong believer in the absolute truthfulness and honesty of those in what is called the "trade;" but, I daresay, they are like most other mortals, and desire to make a living as truthfully and honestly as they can, in the face of an equally conscientious opposition. I may, however, be allowed to say this much in their favour, that, although every chemical that comes into my laboratory is tested and weighed or measured, *I have never once found a deficiency in the two latter respects*, but often a failure in quality. Whether the manufacturers or the retailers are to blame for inferior quality and wilful adulterations would be difficult for us to determine; we must therefore leave it to their own consciences, in the absence of any more public tribunal.

Misapprehensions of the same sort as "Lochaber's" are daily occurring in my own experience with my pupils. Nor indeed is it wonderful, when we reflect that the pound, ounce, and drachm, as used by different persons, represent very different real weights, according to whether they may refer to the avoirdupois, apothecaries', or troy tables. As a general rule, goods which have to be weighed are sold by avoirdupois weight, containing legally 7000 grains to the pound, and by its subdivisions, viz., $7000 \div 16 \div 16$. Medicines are compounded and philosophical experiments performed

by the apothecaries' or troy pound, containing 5760 grains, and by their subdivisions viz., 5760 ÷12 ÷8 ÷3 ÷20, and ÷12 ÷ 20 ÷24. A troy or apothecaries' ounce, therefore, consists of 480 grains, but the avoirdupois of 437·5; on the other hand, the troy or the apothecaries' pound contains only 5760, and the avoirdupois 7000, grains. A familiar instance may serve to illustrate the practical confusion caused by the arbitrary methods of subdivision of a "pound" adopted by different tradesmen. A grocer subdivides his by the divisors 16÷16; an apothecary by 12 ÷8 ÷3÷20; and a goldsmith by 12 ÷20 ÷ 24. Surely this is perplexing in all conscience; but, as if it were not enough, they must needs add to it by fixing the grocers' pound at 7000 grains, and the apothecaries' and goldsmiths' at 5760.

With respect also to our measures of capacity a great deal of laxity of expression and practice prevails. The imperial gallon has been fixed by statute to contain 70,000 grains of distilled water, when the thermometer stands at 60° Fahr., and the barometer at 30 inches. The 160th part of this, or 437·5 grains, constitutes an imperial fluid ounce, which is the standard of the small glass ounce measures we habitually use, and contains precisely one ounce avoirdupois of pure water at the above temperature and pressure of the atmosphere. The subdivision of the gallon into quarts, pints, gills, ounces, drachms, and minims is now the only legally-recognised fluid measure, and would be simple enough were liquids invariably measured. Unfortunately this is not always the case. Some liquids, such as nitric and sulphuric acids, ether, alcohol, &c., which are generally bought from the manufacturers by weight, are retailed either by weight or by measure, just as it may suit the convenience or self-interest of the seller. An ounce of nitric or sulphuric acid may, therefore, mean either 437·5 or 480 grains by weight, or it may mean a quantity equal in bulk to the space occupied by one avoirdupois ounce of distilled water. Now, if measured by the latter method, a considerably larger weight of acids than 437·5 grains would represent an ounce, on account of their high specific gravity. On the other hand, when we speak loosely of an ounce of ether or alcohol, it is, by measure, less than one ounce by weight, exactly in proportion to the difference between the specific gravity of distilled water and ether or alcohol. For illustration, to use again a familiar example, it would puzzle us all to define precisely what is meant by a "pound" of collodion. According to our present lax habits of expression and practice it may represent twelve ounces by troy or apothecaries', or sixteen ounces by avoirdupois, weight. It may also be taken to mean twenty, sixteen, or twelve fluid ounces, according to custom or caprice.

In the midst of this chaos of "confusion worse confounded," there is only one little weight the standard of which is unchangeable, viz., the grain; and it is also satisfactory to know that it is the only one necessary for photographic formulæ. It would, I fear, be fruitless labour, except in the event of a national revolution, to attempt to alter the old habits and prejudices of wholesale and retail dealers by suggesting the introduction of an uniform and rational code of weights and measures such as the French decimal system, which a child can understand. But the photographic brotherhood, I trust, are more amenable to reason, and willing to smooth the rugged path of progress for their younger brethren. Let me, therefore, recommend, as the key to simplicity and uniformity, in all photographic formulæ—*the discontinuance of the terms, scruple, drachm, ounce, and pound as representing specific weights, and the adoption exclusively of the grain and its subdivisions into tenths for indicating the weight of all solids; and the minim, drachm, and ounce, as they at present stand, for the measurement of all liquids, whatever may be their specific gravity or the variable and uncertain customs of the trade.*

P.S. Since the above communication was in type, my attention has been called to a resolution lately adopted by the General Council of Medical Education and Registration, after consultation with the Pharmaceutical Societies of London, Edinburgh, and Dublin. The members of that body have declined at present to adopt the decimal system of weights and measures, but have resolved that the weights and measures used in the British Pharmacopœia shall be the imperial or avoirdupois pound, ounce, and grain, and that the terms "drachm" and "scruple," as designating specific weights, shall be discontinued. This is an important step in the right direction; and, when the resolution has been practically put in force, it will make the old apothecaries' weight one of the things that were. In the meantime, till the public has become habituated to the change, I would still recommend photographers, in their formulæ, to indicate weights by the grain, which must still remain uniform.

PHOTO-LITHOGRAPHY & PHOTOGRAPHIC ENGRAVING.

By J. T. Taylor.

CHAPTER I.

It is thought that a compendium, as comprehensive as possible, of the various photo-lithographic and photo-engraving processes hitherto employed, with a few notes—explanatory or critical—appended may be perused with more or less interest by some of the readers of The British Journal of Photography. Circumstances have induced the writer, although neither a professional engraver nor a lithographer, to take a peculiar interest in the application of photography to these branches; and as for many years he has been in the habit of making jottings on these subjects, he now purposes extending and classifying them for the benefit of all concerned.

Without further introduction, I request my readers to go back in imagination for a few years to the days when the art was young—when Daguerre was among us, and his beautiful invention reigned supreme; when, from the backward state of optical and chemical science as applied to our art, photographic research was carried on under circumstances of difficulty of which the modern photographer can form no adequate conception.

The Daguerreotype picture being taken on a plate of metal, presented certain facilities for the engraver who might wish to reproduce it by means of his art; still it was thought that, if a process of engraving totally independent of the skilled labour of the artist could be brought into operation on these tablets, a most important desideratum would be supplied. Men of science applied their energies to the task, and in due time the problem was, to some extent, solved.

Two processes of etching Daguerreotype plates offered advantages over some others—one by Fizeau, which, if I mistake not, was patented about sixteen years ago; the other being by Mr. Grove, of London. Before, however, describing Grove's *modus operandi*, I would wish to impress on my readers that in an article like the present—which it is obvious cannot be made a mere manual of one or two processes in particular, as it is rather intended to be somewhat general in its review—there are many details in the various lithographic and engraving processes which I deem it needless to give; and, in the process in question, I shall assume that the Daguerreotype process is known to all my readers, and also that they possess at least an elementary knowledge of electrotyping.

Having a Grove's or Bunsen's battery of one pair, the plate to be etched is attached as the anode, and a platina plate of the same size, as the cathode. These are inserted into a wooden frame, having two grooves a quarter of an inch apart. This frame is immersed into a suitable vessel filled with

Hydrochloric acid ..... 2 parts.
Distilled water..... 1 part.

All things being ready, contact is now made for about half a minute, after which the plate is removed from the acid, washed thoroughly with distilled water, placed in a dish containing a weak solution of ammonia or hyposulphite of soda, and the deposit removed from its surface by gentle rubbing with cotton. When this is effected, it is again rinsed with distilled water, and dried. A plate engraved by these means is obviously so delicate as to be capable of yielding a very limited number of impressions, but it might be multiplied indefinitely by the electrotype process. I once saw a very fine portrait of a lady which had been engraved in the before-mentioned manner, and in which the gradations of tint in the face were very beautifully rendered. The author facetiously remarks that a plate so engraved, instead of being described as "drawn by Landseer, and engraved by Cousins," would be "drawn by light, and engraved by electricity."

Coeval with Daguerre's discovery was that remarkable one of the elder Nièpce, namely, that a film of bitumen, by being exposed to the action of light, becomes insoluble in menstrua in which it was formerly quite soluble. This discovery laid the foundation of both a process of photo-engraving and of photo-lithography. These we shall speak of in their order.

M. Nièpce de St. Victor produced engravings about ten or twelve years ago by the following method:—a plate of steel is polished, cleaned, and treated with acidulated water, consisting of

Hydrochloric acid ..... 1 part.
Water ..... 20 parts.

The plate is then washed and dried. It is now, by means of a roll of cloth covered with leather, coated with an uniform layer of bitumen of Judea, dissolved in essential oil of lavender, and, after being dried by a gentle heat, it is carefully protected from light and damp. It is now exposed in the printing-frame in contact with a

glass or paper positive for a period of time varying, according to the light, &c., from fifteen minutes to an hour, after which it is treated with

Naptha ..... 3 parts.
Benzole ..... 1 part.

The unimpressed parts having been dissolved, the action of the solvent or developer is stopped by water, and the plate being dried it is now ready for the engraver. The biting or etching solution is composed of

Nitric acid ..... 1 part.
Alcohol ..... 2 parts.
Distilled water ..... 8 „

This fluid poured on the plate begins to act at once; but it is desirable to remove it after a short time, and form a grain by means of powdered resin, as in aquatint engraving. The plate being then heated and allowed to cool, the etching is continued by means of the foregoing solution, omitting the alcohol. Some portraits by this process were submitted to the Academy of Sciences about ten years ago, and it was stated that they were absolutely untouched by the graver.

About the same time a patent was secured for a photo-lithographic process founded on the same discovery of Nièpce. A lithographic stone or zinc plate is coated with a solution of bitumen in sulphuric ether, and, after being exposed to light under a negative, it is washed, developed, or fixed, by an etherial or other solvent. The stone is now in a fit condition for etching and inking in, after which it is handed over to the printer.

Some details of the latter process were furnished by Mr. Macpherson, of Rome, in a paper read before the Photographic Society of Scotland, in 1856. I may here state that the specification of the patent was enrolled on May 5th, 1853. The patent itself is dated October 14th, 1852. There is nothing like being particular as to dates. Mr. Macpherson then furnishes details, of which the following is a synopsis:—a piece of bitumen of Judea, about 1½ inch square, is reduced to powder and put into a bottle; six ounces of sulphuric ether are now poured on it, the whole shaken for ten minutes, and, after the sediment subsides, the liquid is poured off and its place supplied by an equal quantity of fresh ether, which must be allowed to remain in contact with the bitumen for fifteen minutes. It is this second solution which must be used: the first is not fit for the purpose. The filtered liquid should be of a beautiful brown transparent colour. A lithographic stone, prepared with a very fine grain, as if for a chalk-drawing, is next placed quite level on a table, and as much of the bitumen solution poured on the centre as will cover it. Currents of air should be avoided, owing to the volatility of the ether. In less than a minute the whole of the ether will have evaporated. The negative is then laid down upon the stone, and the whole is exposed to light. The exposure varies, according to the light, from half-an-hour to three days. After exposure the stone is gently immersed, face downwards, in a flat bath containing ether, to the depth of one-eighth of an inch. After remaining for eight or ten seconds, it is raised up to an angle of 45°—two or three times, up and down. It is now turned face upwards, and some ether poured over its surface to complete the removal of the bitumen. The stone is now sent to the printer, who etches it as he would a chalk-drawing, and, after being covered with gum, it is next day ready for printing. From a stone so prepared, from which five hundred impressions had been taken, no difference could be seen between the last and the first. It is gratifying to be able to state that I learned from Mr. Macpherson, a few evenings ago, that he has not found it necessary to make any change in his method of operating, as here detailed.

In the year 1853—a year fertile in photographic discoveries—M. Martin communicated to the Paris Academy a clever way of engraving photographs. A metallic plate is coated (on *both* sides), in the usual way, with the ordinary etching-ground of the engraver, after which it is coated with collodion, sensitised, exposed, and developed, in the ordinary manner, as a positive. This being fixed and dried, serves the same purpose as an ordinary tracing on the etching-ground or varnish. A second impression on glass preserves as a copy the design the engraver destroys on the plate as he proceeds with his work. This, it will be observed, is not entitled strictly to rank under the head of photo-engraving, but it is so useful that I thought it well to enrol it among other more scientfic and legitimate methods.

In connexion with Nièpce's process, and as finishing the present chapter, I may here detail M. Baldus's method of preparing engravings in relief from photographic impressions. A copperplate, prepared with bitumen, and ready for etching, is attached to the positive pole of a Bunsen's or Grove's battery, and placed in a saturated solution of sulphate of copper, with another plate of copper connected with the negative pole. The lines of the image—the parts unprotected by the bitumen—are dissolved out in the voltaic action, and the copper precipitated on the other plate. When the lines are bitten deep enough, the connexions with the battery are reversed, and then, consequently, an electrotype impression in relief is deposited upon the original plate. It is requisite the voltaic action should be moderate.

DIORAMIC EFFECTS PRODUCED ON PHOTOGRAPHIC PICTURES.*

By John Taylor, M.D.

In common pictures a certain definite arrangement of light, shade, and colour are chosen; and by these the *effect*, as it is called, is produced and rendered *permanent* under all varieties of light and position. No change takes place in the aspect of the picture, whether the light by which it is seen is strong or feeble.

The well-known inventor of photography, M. Daguerre, many years ago devised a method of executing paintings which could change their *effect* according to the manner in which they were lighted. Thus, for instance, a landscape first seen as if in the full luxuriance of summer, with foliaged trees and browsing cattle, or groups of figures, would change, by insensible degrees, into the desolation of winter, with the same objects as previously seen now covered with snow, the figures entirely gone, and no sign of life visible but, perhaps, the glimmer of the fire-light from some cottage window. Those only who have seen such pictures, when well executed and properly managed, can conceive the surprise and gratification produced by these transitions of effect.

In common with every one who has seen these dioramic productions of Daguerre, I have frequently longed to possess some of them, and many years ago even tried my hand at their execution, with sufficient success to enable me to understand the methods of this art, and also to perceive the great labour as well as care necessary to produce the full effect.

These pictures required great skill in execution, with most accurate drawing, and were, consequently, so expensive as to be beyond the reach of ordinary purchase, except for public exhibition.

When the transparent photographs on glass came out, with all their truthfulness and precision, it occurred to me that here again was a chance for the diorama. New trials were set about, and the results are exhibited in the apparatus now before the Society. They are on a comparatively small scale, and their chief defect is, that they can be viewed by only a very limited number of spectators at a time.

If large pictures on glass could be executed with the force and detail of the new art, such an exhibition as never before was possible might be got up on a scale that would render it visible at once to a large assembly of spectators, each of whom, instead of looking through a cosmoramic glass, might be provided with a binocular opera-glass for the purpose of bringing out the minute details of the pictures.

The apparatus, as at present constructed, consists of—first, the cosmoramic box in which the picture is contained; second, the colour cylinder, by which the picture is illuminated; third, the twisted string and viscid liquid by which the motion of the colour cylinder is maintained and regulated.

The cosmoramic box is a rectangular box, three feet in length by two feet deep, and two feet broad. In the one side of this there is an opening of about the same size as the picture. A sliding frame, having two apertures cap ble of containing two pictures, is so arranged that it can bring either of the two pictures to be viewed through the opening in the box. The use of the frame is to allow one of the pictures to be changed while the other is being seen by the spectators. This is simply, however, a matter of convenience, and has nothing to do with the effects of the apparatus. In the side of the box opposite the picture four lenses, each about twenty-two inches in focal length, and about four and-a-half inches in diameter, are placed—a part of the frame in which they are fixed being made curved, to allow of those at the sides being presented more directly at the picture. The interior of the box is blackened, and in it are placed some small pieces of natural foliage, so as to come, to some extent, between the eye and the picture, to afford variety of form, and to increase the illusion as to distance.

The pictures should be as large as possible: in the present instance they are fourteen inches by twelve inches. They are prepared by carefully dimming the glass, on the opposite side from

* Read at a meeting of the Glasgow Photographic Association, Dec. 4th, 1862.

that of the photograph, with a small portion of fine white-lead paint, applied by means of a pad of satin over cotton-wadding. Careful manipulation is necessary to apply this, so as to make it look like finely and very slightly ground-glass. The sky and all the parts of the picture should be similarly dimmed; but over hills, buildings, and other opaque objects, the film of paint must be made thicker, so as to obstruct the distinct vision of objects through them. A little practice easily enables the operator to judge of the degree of opacity required. The picture might now be put into the apparatus; but a better effect is produced by applying thin films of appropriate colour, by means of the dabber, over the white lead. Delicate bluish tints over parts of the sky and distance, and of warmer colours on the near parts, increased in strength on prominent objects, such as figures, will add strength and contrast.

The colour cylinder consists of a light cross of wood, with a wire encircling its outer border, so as to form a hoop of about six feet in diameter. To this is fastened the upper edge of about eighteen feet of white cotton cloth, in such a manner as to form a cylinder about three feet deep. The lower edge is kept stretched by a hoop of wire without any cross-bars in it. The outside of the cylinder is painted with oblique bands and irregular cloud-shaped patches of colour and darkness alternating with light. The colour of the lights round the cylinder varies from white through yellow, then orange, and ultimately red and deep crimson, so as to represent the transitions from daylight, through the evening colours, to darkness. The inside of the cylinder is also painted, but each portion of a different hue from the corresponding part without. This cylinder, being made of collapsable material, can be flattened into a disc for packing or putting aside when out of use. When in use, it is suspended, at the centre of the cross, from the roof by a string four or five feet in length, made of about twelve strong threads. This string, when twisted, communicates, in unwinding itself, a rotatory motion to the cylinder. To regulate this motion a rod or thick wire passes down from the centre of the cross for a distance of about three feet, and has attached to its lower end four vanes of tinned iron, which dip into some viscid liquid, such as molasses, placed in a dish at the proper height. It is easy, by raising this dish, or by lowering the cylinder, to produce as slow and steady a motion as may be desired. When it is requisite, more twist can be given to the string by pulling a thread which has previously been wound round a bobbin, which runs on a small axis attached to the cross. This apparatus is exceedingly simple and efficient in its action, though, without a diagram, rather tedious to describe.

To afford the requisite light, a row of four or five gas-burners is placed along the front of the cosmoramic box, immediately above the pictures, but so arranged that no portion of direct light falls on the picture. The colour cylinder is placed at a distance of about ten inches from the gas jets, and a white surface, such as white-painted tinned iron, is put behind the gas jets, to throw forward the light to the cylinder, which would otherwise pass backward toward the eyes of the spectators. Another light, consisting of two or three gas jets, is placed inside the cylinder, at a distance of six or seven inches from the side next the picture. Both of these lights, the external and internal, are controlled by stopcocks, to enable the operator to vary the effect at pleasure, by lessening or increasing them alternately.

The only remaining portion of the apparatus consists of a means by which the appearance of a moon or sun can be introduced into a picture, or by which one picture can be made apparently to dissolve into another, or a summer effect may gradually seem to deaden down into winter with a covering of snow, &c. The means by which this is accomplished—though it occurred to me without having seen anything of a previous invention—I now find has been in use in what is called the dissolving stereoscope. I have not seen this instrument, but am told that the method is the same. A plate of thin glass, nearly as large as the box will hold, is placed in its interior at an angle of about 45 degrees with the horizon, the lowest edge being nearest the spectator and the highest nearly close to the upper edge of the aperture in front for the pictures. In the roof of the box another aperture is made, and another picture is laid on it. The result is that when a white reflector is put above this picture the latter is seen by reflection in the glass plate, and appears to occupy a position in front similar to the ordinary picture. By shutting off the light from the painted cylinder the first picture vanishes and the second vividly takes its place, or by illuminating both they are seen overlapping each other. If a sky covered with clouds, and having a transparent portion to represent the sun or moon left in it, is put on the upper opening, the ordinary picture in the front aperture may be made to appear as if the clouds were clearing away and the moon bursting forth in the sky. So also a photograph of a summer landscape being placed in the front aperture, and the same scene taken in winter placed on the roof, the one can be made insensibly to change into the other.

A peculiarity of these pictures, exhibited in the manner described, is the apparent depth of their atmosphere. The clouds seem as in nature to lie far beyond the buildings and behind each other.

These appearances are due to the actual difference of distances from the eye to the pictures of the buildings, &c., and to the colour cylinder on which the clouds are moving requiring a different focal adjustment of the eyes and a corresponding perception of difference of distance. This effect is heightened by the presence of the lens through which the spectator is looking. The apparent motion among the clouds themselves, by which one set seems to move faster than the other, in close imitation of nature, is owing to a different cause, which may be shortly described as follows:—The colour cylinder on which the clouds are depicted is illuminated by two different lights—one shining on it in front, the other from within—and therefore casting transmitted light and colour on the picture. The clouds on the outside are seen through the sky of the picture, and move with the common velocity of the surface of the revolving cylinder. The clouds depicted on the outside are shown only as shadows cast on the picture from the internal light, and appear to move as much faster than the real cloud or portion of the surface of the cylinder on which it is depicted, as the picture on which it falls is further from the internal light than the surface of the cylinder. So by using at the same time an internal and an external light, and by placing the internal light more or less near the surface of the cylinder, we can have any required degree of apparent relative motion between the different masses of cloud.

A remark has sometimes been made by those who have not seen the effects produced by the dioramic apparatus of which we are now speaking, but have only heard a description of it, that as the bands of colour on the revolving cylinder pass successively behind all the solid objects represented in the picture, such as mountains, buildings, &c., as well as behind the sky portion, these objects must become tinted with the same hues as the sky, the water, &c., and thus a degree of monotony of colour will be produced which would not be in keeping with the variety seen in nature. In reply to this, it is sufficient to observe that in the preparation of the photograph for use in the instrument the different parts of the picture are themselves tinted on the glass with different colours—not strongly, yet sufficiently to distinguish them from each other and to modify any hue which may afterwards be transmitted through them from the colour cylinder. For instance, the sky and distance may be tinted of a bluish or cool neutral grey, while near buildings, banks, roads, &c., have varying tints of red, yellow, or brown.

The effect of this is that, though a piece of flat colour were put behind them all, they would each retain partly its own shade while partaking of the general hue of the background. Those who are familiar with ordinary pictures, the production of the artist's hand, know how rare it is to see a work well varied in colour yet possessing a glow as of real light. They also know that this latter quality is got, not by the mere brightness or whiteness of the colour, but by the prevalence of a certain *unity* of hue through the whole picture, giving it what is called *tone*—a quality eagerly sought after by artists in the finishing up of their works. It is often given by a thin wash or glaze, as it is called, of one colour over the whole picture. The effect of this glaze, if properly managed, is, though dark in itself, to make the picture look brighter or more luminous than before.

In nature we constantly observe this tendency of light, when brilliant, to imbue all the objects seen by it with its own hue. In a sunset, for instance, if the light be dim, we see the light of the sky of a yellow or red tinge, while the objects seen against it, such as mountains, spires, &c., seem of a cold grey, or even of a blue colour. But let the light become intense, as in a vivid sunset, the whole of the intervening atmosphere partakes of its hue—the distant mountains, as well as the nearer masses of foliage and buildings, lose in a great degree their local colour, and take on the tint of the light. Hence the expressions—"a yellow radiance filling all the vale;" the whole landscape was "steeped" in the sunshine. The term "bathed in light," and many others of a similar import, refer to the same "toning" effect of bright illumination. The philosophy of the origin of this effect of tone would be a subject for long discussion; but it may be briefly stated that the chief causes of it are—the illumination of the atmosphere, the effect of reflected lights, and a physiological action of light on the eye itself, producing what is called "irradiation."

This quality of tone, proceeding from one prevailing hue, is

essential to every picture which is to represent brilliant illumination. It is a chief source of beauty in landscape, and it fortunately happens that it can be got in those transparent glass photographs when subjected to the dioramic apparatus more perfectly than in any other species of picture; hence their aptitude for representing the brilliancy of noonday sunshine, or the splendours of tone of dawn or sunset.

To judge of the capabilities of this dioramic apparatus it is necessary to watch for a considerable time the succession of changes which appear, and also to witness them on several pictures and in favourable circumstances. On an occasion like the present this, I fear, will not be easily accomplished; but I must only assure those who may not succeed in seeing any effect which comes up to their expectations, that it is, in some degree at least, the fault of the circumstances.

I have thus described the simplest form of the dioramic apparatus and the mode of exhibiting some of its effects, and have only time to allude to other modifications of construction by which greater efficiency can be produced. 1. By a sliding frame in the roof aperture of the cosmoramic box, various skies can be successively introduced, as moonlight or sunset effects, &c., the same picture all the while remaining stationary in the front aperture. 2. By a little skillfully-applied tinting with the brush on the side of the picture which is to be placed next the spectator—and by the introduction of a light on it from the interior of the cosmoramic box, while the illumination of the colour cylinder is kept low—it is easy to produce on the same picture many changes, such as the vanishing of figures, &c., as in Daguerre's dioramas,—the figures, &c., reappearing when the front light is lowered and the back light from the colour cylinder again made to traverse the photograph.

Long Delayed, but Not Quite Forgotten.—We have received from Mr. S. Highley an illustrated catalogue of his scientific educational collections relating to photography, physics, chemistry, crystallography, physiology, osteology, medicine, astronomy, geology, microscopy, zoology, botany, and mineralogy—a pretty long list, it must be owned, and embracing many branches of science, each one of which may take a lifetime to master. Mr. Highley has for some years been connected with this Journal, either as a contributor or sub-editor, and during that time the duty of noticing all apparatus connected with photography has been committed to his special care. In the performance of so delicate a task, Mr. Highley has not only displayed tact and sound judgment, but, what is of even more importance, he has performed such duty faithfully and conscientiously. He has repeatedly drawn attention to the merits of others, without having attempted, on any single occasion, to obtrude his own productions. We are at all times extremely watchful to prevent the pages of this Journal being prostituted to the purposes of advertising puffery. When Mr. Highley first became associated with us, we enjoined strict adherence to independent criticism on his part; and we are bound to state that we have found him a willing and efficient coadjutor in conformity with these principles. We have, therefore, scarcely done him justice in not having before now introduced to the notice of our readers the merits of Mr. Highley's own productions. The description of apparatus in general having been his peculiar department, we have overlooked what he *could not* force upon our attention. The publication of the catalogue above named, with a copy of which we have been favoured, has awakened us to the hardness of measure dealt out to him; and we have much pleasure in notifying to those of our readers who are already, or who are likely to be, engaged in scientific pursuits that they will do well to pay a visit to Mr. Highley's show-rooms, at No. 70, Dean-street, Soho, London, where they will have an opportunity of examining, at their leisure, a large collection of philosophical apparatus, meet with courtesy, and have the willing assistance of the proprietor in selecting such as may be best suited to their requirements. Without pretending to be thoroughly skilled in the use of all the multifarious apparatus which he manufactures, he at least understands the object of each, and its special application; and from his long and intimate acquaintance with men of eminence in most branches of science, he knows, too, how to cater for their various and ever-increasing demands. We are happy to learn that since the close of the International Exhibition, Mr. Highley has been pretty fully occupied in ministering to the wants of scientific experimentalists, and that he is shortly to read papers, by invitation, *On the Application of Photography to Educational Purposes*, at meetings of the Phototographic Society and of the Society of Arts. We trust he may have numerous auditors, being satisfied that they will be well and profitably entertained.

Meetings of Societies.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society took place at King's College on Tuesday, the 2nd instant,—P. Le Neve Foster, Esq., M.A., in the chair.

The minutes of the last meeting were read and confirmed.

The following gentlemen were ballotted for and duly elected members of the Society:—Messrs. Callaghan, Bishop, J. T. Lucas, Ernest Edwards, Edmund Borchert, Baron von Jasmond, Henry Cooper, C. T. Newcombe, F. W. Hart, George Hare, and T. R. Window.

The following gentlemen retire from the Council:—Messrs. Major, Maskelyne, Fenton, De la Rue, and Kater. It is proposed to replace these gentlemen by the following:—Lord Henry Lennox, Lieut.-Colonel Stuart Wortley, Messrs. Cole, Hennah, and H. Pollock. For Vice-President James Glaisher, Esq., F.R.S., is proposed to replace P. Le Neve Foster, Esq., who retires from that office to occupy a seat in the Council. It is proposed to request the Lord Chief Baron to retain the office of President.

Mr. C. Jabez Hughes, of Ryde, Isle of Wight, exhibited some very superior views of the interior and exterior of Whippingham Church, and also some exterior views of Osborne, which were much admired.

The Chairman called on Mr. T. A. Malone to bring forward his communication—

On the Nature of the Photographic Image.

Mr. Malone explained at the outset that he had had no intention of occupying the principal place on that evening, but that having prepared a few notes on the above subject for the last meeting of the Society, and no opportunity having offered for then bringing them forward, he had arranged with Dr. Diamond to do so on the present occasion. He would, therefore, proceed to direct attention, as briefly as possible, to the specimens which he had brought to illustrate his remarks, in the hope that they would form the basis of an interesting discussion.

The speaker said that it would doubtless be within the recollection of many gentlemen then present that he had on a previous occasion, namely, on the 5th of November, 1861, introduced the subject to the notice of the Society.* Speaking generally on the subject, he said that it was to be regretted that there were so many theories and so few definite facts known in reference thereto, that it was absolutely necessary that a course of experimental inquiry should be persistently maintained if it were desired to arrive at certain knowledge in connexion with the subject in question.

He was again led to inquire into the Nature of the Photographic Image in the following manner:—He had prepared some ordinary ammonio-nitrate paper, and, having obtained the print and washed it in order to remove the free nitrate of silver, had placed those washings, containing nitrate of silver and (it may be presumed) organic matter, in a large bottle exposed to the sun during a whole summer.

The first action of the light seemed to be the production of a dark deposit, of a flocculent character, which gradually became violet and black. So far, there was nothing very remarkable to observe; by continuous exposure, however, the precipitate passed from violet and black to ash-grey, and was no longer light and flocculent, but fell heavily through the liquid, being sent backwards and forwards with great readiness.

It would be interesting to know what change had taken place in this experiment; and to that end he would show a portion of the substance, which it was easy to collect on a filter. [Mr. Malone here handed round some dull black powder, like charcoal, on a piece of white filtering-paper.] It would be seen that, in that condition, it was entirely destitute of metallic lustre; on burnishing, however, that characteristic lustre was soon imparted. [Another piece of paper was then passed round examination by the members, having some of the burnished powder attached to it: it possessed a decided metallic lustre.] That he (Mr. Malone) considered as showing that the action of light and organic matter was to reduce the silver to the metallic state.

Allusion was then made by the speaker to the experiments made by Mr. Spiller in this direction; the latter gentleman, however, had not tried the action of organic matter in his experiments, and, so far, had not disposed of the theory which assumed the formation of a suboxide of silver. It would be remembered that Mr. Hardwich had insisted that suboxide of silver (Ag_2O) was formed in combination with the organic matter of the paper, then it must be supposed that he (Mr. Malone) had produced the salt: if that were so, whence arose the metallic lustre? He would admit that there the difficulty began; and he would draw attention to the fact that any comparison founded on lustre might be fallacious.

Chemists were not agreed as to the existence of suboxide of silver. As early as 1822 Mr. Faraday had investigated the subject, and advanced certain opinions which were not accepted by Berzelius, who proposed at the time to re-investigate the subject, the atomic weight of silver not being then accurately known.

It was known that ordinary oxide of silver was soluble in acetic and other acids, while the action of acetic acid on the alleged suboxide of silver was to convert it into acetate of silver and metallic silver, in, it is suggested, a similar manner to the conversion of suboxide of copper by hydrochloric

* A detailed report of Mr. Malone's remarks will be found at page 401, vol. VIII. of The British Journal of Photography.

acid into chloride of copper and metallic copper. The action of acetic acid did not prove to him (Mr. Malone) that that was suboxide of silver: the constituents might be only mixed, and then separated by the acetic acid. It would thus be seen there was doubt and difficulty attending the whole subject. Oxide of silver was, doubtless, well known to the members as a brown body which had recently been prepared and introduced into photographic commerce for correcting the acidity in the nitrate bath. Having reminded his hearers of the qualities of that compound, the speaker observed that it would not do to say from mere appearances that the photographic image did not consist of oxide of silver, and yet it must be remembered that the image deposit which burnished bright was not soluble in acetic acid, which would seem to imply the opinion that therefore it must be metallic silver, although, also, the fact must not be lost sight of that if a little oxide of silver were placed on blotting-paper, and burnished, *it* would yield a metallic lustre. He (Mr. Malone) would then digress for a moment to observe that the phrase "metallic lustre" was a very vague one, since many metallic sulphides—as sulphide of iron (mundic) and sulphide of copper (peacock copper ore)—possessed it in the highest degree of perfection, so that mere lustre proved nothing: the fact of oxide of silver yielding a metallic lustre by burnishing only served to show that the further experiments were conducted the more difficult the subject became.

Having then made so many admissions which seemed fatal to the hope of arriving at any accurate notion as to the nature of the photographic image, he would say that he was nevertheless prepared to substantiate the statement that, in his opinion, *the sole action of light on photographic mixtures of organic matter with salts of silver was the separation of silver in the metallic state.*

The speaker stated that that opinion was based on accurate experimental observation. He had lately examined a leaf of metallic silver, of undoubted purity, beaten extremely thin. It was, of course, essential that it should be perfectly pure silver, which it was not easy to obtain in the leaf state; but the specimen he had examined had been prepared expressly by Mr. Marshall from *pure* silver, and that, when examined by *reflected* light, as might naturally be supposed, was found to retain its white colour; but, on examining it by *transmitted* light, it was found to possess a pale lavender colour, with a tinge of red—a combination of tints which he believed had been distinguished by the term "dove-colour."

Then it was evident that if it were possible by mechanical means to break up the particles of silver sufficiently small, so as to destroy the lustrous surface, a lavender tint would be sent to the eye by transmitted light, and indeed, whether viewed by reflected or transmitted light, a lavender tint would still be the result, similar to that acquired by sensitised paper when first exposed.

That, however, was only another illustration of the same view of the matter. Liebig had obtained, by acting on nitrate of silver with organic matter, somewhat similar results. The appeal to the character of such precipitates was regarded as doubtful, and it remained to be seen how far he (Mr. Malone) would substantiate by this new illustration the views he had propounded. Before quitting that part of the subject, however, he would just further allude to the fact of Professor Faraday having obtained his suboxide of silver by dissolving oxide of silver in ammonia, and allowing this ammoniacal solution to evaporate. He would merely observe that the product of that operation, although alleged to be suboxide of silver, possessed a decided metallic lustre; and for his own part he (Mr. Malone) doubted the interpretation of the experiment, as he considered that a somewhat complex interchange of elements took place, in which oxygen was absorbed and nitrogen eliminated, the hydrogen of the ammonia reducing the oxide, at least in part.

The views he was endeavouring to support received singular and unexpected aid from an examination he had one day made of some vignette glasses at Messrs. Claudet and Houghton's, Holborn. The members were doubtless well acquainted with the kind of glasses to which he referred. The especial peculiarity of those he examined was that, while possessing the usual deep orange-yellow by transmitted light, they had by reflected light from the inner portion a grey metallic lustre, and in some portions also a blue tinge; all those colours being yielded by the one body—silver.

Faraday attributed the colour of ruby glass to finely-divided gold; he, however, was not, it appears, the first to make that suggestion, since Mr. Charlton, in the *Annals of Philosophy* for 1821, had advanced from experiment a similar opinion. It was known also that platinum yielded a fine black in enamels, and in that and similar instances with some other metals the effect was clearly attributable to the *metal itself*, since no oxide of the noble metals could resist the temperature to which those enamels and other vitreous preparations were submitted in order to produce the desired effect. It was undoubtedly *the metal* which produced the various colours in a vignette glass, and there was a remarkable instance of a metal yielding different colours by reflected and transmitted light.

He would then direct attention to some negatives he had taken during the summer, which he also thought afforded efficient support to the opinion he had advanced and was then endeavouring to establish. It would, he hoped, be seen by the method of illumination which he would then set in action. [Mr. Malone, having previously provided himself with a bottle of oxygen gas, here plunged a fragment of phosphorus into it, and by its combustion produced a light rivalling in purity and whiteness any of the well-known methods for producing white light. By its means the audience were enabled to see the peculiar features in the negative to which the speaker drew attention.] It would be seen, he said, that in one of the negatives the sky was sky-blue, and in another orange-yellow—both of them the very colours in the same order as he had seen them in the vignette glasses at Claudet's. He might then observe incidentally, though he feared he should be discouraging some experimenters, that the hope of obtaining objects in their natural colours by collodion was, in his opinion, a fallacious one. The colours he had then exhibited in the negatives would at once suggest the manner in which many had been misled in that respect.

By varying the proportions and the time of exposure it was possible so to reduce silver from its solution and compounds, as also by an ethereal solution of phosphorus, so as to obtain all the various colours to which he had alluded, and which frequently existed in one and the same specimen of vignetting glass. Those facts, taken in connexion with what had already been stated, he thought strong presumptive evidence in favour of the opinion that all the varied appearances he had described were but different molecular modifications of the same thing, viz., metallic silver; and, if so, the obvious conclusion was that the photographic image, even in all cases, consisted of finely-divided metallic silver. He was sensible that it would not be proper for him to insist too much on the accuracy of his view of the matter; and, although he had thus introduced his opinions and observations to photographers, the merit would finally accrue to those who should succeed in establishing the point in question on an indisputable basis, for the older chemists had already stated that the reduction of silver salts by light was metallic.

Mr. Malone again reverted to the hopes which were entertained by some of obtaining photographs in natural colours, describing negatives he had obtained, in which red bricks were represented by red; but, unfortunately for the *blue* slates, they were also rendered *red!* He assured his hearers that, in his opinion, the variations in the colour were produced simply by differing duration of action of the light. Allusion was also made by Mr. Malone to the researches of Becquerel in connexion with the subject, and he expressed a doubt as to whether the experiments would, from this new point of view, stand a searching investigation.

In reference to the inferences which might be drawn from the present facts, the speaker stated that the opinion was entertained that, if gold were substituted for silver by a process of toning, an addition was thereby gained in point of permanency; but it was wrong to argue from metals in the gross to the same metals in a state of minute division. Chemists well knew that a state of minute division was eminently favourable to chemical action. He thought there was good ground for assuming that the varieties of the metal which he had described were allotropic conditions of the same substance, and might be differently acted upon—favourably or otherwise, experiment alone could determine.

[In explaining the term "allotropic" Mr. Malone instanced phosphorus, which was capable of existing not only in that condition in which it was well known to everyone, but also in the form of a brick-red powder, which might be rubbed with impunity in a mortar in the open air, and carried with safety in the pocket.]

In additional support of the opinion he had advanced, he might refer to the fact that an ordinary print would resist the action of acids, which were solvents for the *oxides* of the metals of which they were composed; and it would also resist partially the action of caustic potash—additional facts which went to prove that the silver and gold forming the image existed in the metallic state. He might observe, however, that although the image resisted the action of acids and alkalies, it would not resist the action of sulphur as sulphide of ammonium; and, moreover, that if a leaf of even metallic silver were floated *on* a solution of cyanide of potassium in contact with air it dissolved very rapidly; if, however, it were placed below the surface of the liquid, it would take twelve times as long.

Faraday explained this phenomenon by assuming the formation of an air voltaic circle. It was desirable to see if an action analogous to that of Zamboni's pile might result from the image, and any fixing salt remaining.

The speaker next adverted to the products of decomposition in an albumenised photographic print, stating that moisture was one necessary condition, and the products were generally ammonia and sulphuretted hydrogen. There was, however, a still more subtle kind of decay called "dry-rot," which, by the way, never occurred until dampness set in. He only referred to those points to show the subtle nature of decay. He did not fear sulphur, or hyposulphite of soda in contact with *dry* silver or gold.

In speaking of the difficulty of removing the final traces of the fixing agents, he (Mr. Malone) alluded to the researches of Professor Graham in connexion with dialysis, and showed how obvious it was that albumen and gelatine in the paper, and even the paper itself, possessed the *colloidal* condition, and in that condition tenaciously retained portions of the *crystalline* fixing agent, which could not be *rapidly* removed by a process of mechanical sponging, but must be left for the slow action of dialysis by placing the print in a hair or metal sieve or other convenient arrangement.

The chief precaution, however, to be observed in the preservation of photographs was to keep them dry; for it would be readily understood that if dry hyposulphite and nitrate of silver were mixed there would be no reaction, but as soon as moisture came into play change would take place. It was easy to apply that fact to the case of photographic prints: they *must be kept dry.* He thought that sufficient regard was not paid to the existence of foreign salts in the water of all large towns: those might be removed by a final washing with distilled water.

[The speaker here exhibited a print of Dr. Diamond's, in which the

parts exposed to the light had *not* faded, while those protected by the mat had, and endeavoured to explain it in accordance with his own views of damp and dryness. Dr. Diamond aided in the explanation, but did not seem to concur in or apprehend the opinion expressed by Mr. Malone.]

In conclusion, Mr. Malone desired to apologise for the length of time he had occupied, and the imperfect manner in which he feared he had brought the subject before the meeting, trusting that the interest attaching to the subject would be his excuse, and that others might be induced to take the matter up and carry it forward by experiment with still more steadfastness and skill than he had done.

[Mr. Malone resumed his seat amid loud and protracted applause.]

The Chairman having invited discussion on the subject of Mr. Malone's address,

Mr. Mayall said that he was sure all the members must feel indebted to Mr. Malone for the zeal he had displayed in the investigation of that interesting question, the importance of which he (Mr. Mayall) need not dilate upon, since upon its satisfactory solution depended the permanency of the photographic print. He was quite prepared to bear out the opinion expressed by Mr. Malone in reference to the extreme state of division in which the particles of silver and gold existed in the photographic image, and that in proportion to the state of division so the colour was modified; but as they were all there for the purpose of inquiring into and elucidating matters which were brought before them, he would just throw out a suggestion without presuming to instruct Mr. Malone in the matter. The members were aware that there were two things which were necessary to the formation of a photographic image: first, light, and secondly, silver in combination with either iodine, bromine, or chlorine; and in reference to those latter he (Mr. Mayall) said the purer they were the better and finer was the resultant image. Another point was that it was the blue end of the spectrum which came into play. All photographers knew that. Then the question was, in what condition was the film at the time of the light's action, magnetically considered? It was in an electro-negative condition, and the light acting on the haloid salt pushed the electro-negative element out of its feeble combination, and left on the surface of the image a fretwork (so to speak) equivalent in quantity to the light producing the image. In illustration of his views, let the members consider for a moment the action of white light on the sensitive film. It produced the most intense action, and so far was an exact register of the actinic force it possessed. Take another instance—that of a lady with a yellow shawl, and some portions of blue and green in her dress. The negative obtained from such a subject would be a registration of the action of the sun's light reflected from that radiant. In his (Mr. Mayall's) opinion the investigation of the whole subject of the nature of the photographic image would be found to have a magnetic bearing. In support of that opinion he would describe to the meeting an experiment. If a sensitised collodion film were placed for a few moments in contact with a stationary magnet, and some developing solution were subsequently poured over it, it would be found to yield an image just as though it had been exposed to light. He further entertained the opinion that if they could produce the haloid salts by any other means than those at present in use, they should be one step further towards proving that some force other than light was concerned in the production of the photographic image. Mr. Johnstone, of Birmingham, entertained similar views to himself (Mr. Mayall) on that point; and to illustrate the fact that the film was in an electro-negative state of tension he had exposed a plate to the light, and previous to development submitted one-half to the action of steam, which by altering the electrical condition actually destroyed the image, while the other half developed in a perfectly satisfactory manner. The idea suggested by those facts was that light had two actions—an electrical and a chemical one. The *thought* was worth pondering on, and if they could establish the *fact* that the electro-negative state of the film was acted upon by the electro-negative, they should have a clearer view of the mode in which to pursue the investigation. He (Mr. Mayall) concluded his observations by promising to occupy an evening in March on the same subject, collecting in the meantime facts connected therewith from his friend Mr. Johnstone, of Birmingham.

Mr. Sebastian Davis, at that late hour of the evening, said he would not occupy the time of the members by any lengthened remarks, but would content himself by simply observing that he agreed with Mr. Malone that a total reduction of the silver took place; and the reason why, in ordinary cases, so long an exposure was necessary was that the action of light must be prolonged sufficiently to effect that complete reduction.

Mr. Williams wished to mention a fact which he thought might be useful to Mr. Malone in prosecuting his investigations. Gold, silver, and the other noble metals, were not only soluble in acids and cyanide of potassium, but also in ioduretted iodide of ammonium—a compound which possessed extraordinarily energetic solvent properties for those metals. He believed attention was first directed to that fact by Mr. Waterhouse, who had availed himself of it to prepare crystals of metallic gold for microscopic purposes; and he (Mr. Williams) had thought it might prove serviceable to Mr. Malone.

Mr. Mayall thought it would be desirable that Mr. Malone should throw more light on the nature of the haloid salts of silver.

Mr. Malone, before replying to the observations which had fallen from the gentlemen who had taken part in the discussion, proceeded to exhibit some specimens which he had brought for that purpose, and in doing so directed attention to the physical characteristics of the various halogens—chlorine, iodine, and bromine—which entered into the compounds of silver employed in photography. Among other things he showed a specimen of liquid *chlorine*, which, instead of being green, as its name would imply, was of a decidedly yellow colour. He also showed that *bromine*, viewed at a certain angle by reflected light, possessed a blue colour; and alluded to the opinion entertained in reference to the blue compound of *iodine* with starch, to the effect that the iodine existed in it *as* iodine in a state of minute division, which, if correct, would show that iodine was of a blue colour. He intimated, in the course of his remarks, that silver might, in certain allotropic conditions, possess a yellow colour; and, supposing that and the yellow chlorine to be combined, it was a curious point to know what was the action of light on substances so antagonistic to the actinic end of the spectrum. Allusion was also made to the difficulty attending the preparation of pure iodide of silver, on account of its tendency to form double salts with a soluble iodide. His (Mr. Malone's) opinion was that it was obtained in its purest form by direct union of iodine and silver. The pure iodide of silver being obtained, however, the point to be ascertained was, what was the action of light thereon? M. Claudet had demonstrated that it was resolved into its elements, and the results obtained by Becquerel would go far to support that opinion. The subject was, however, at present involved in doubt, and afforded a good field for further investigation. He (Mr. Malone) then briefly replied to the observations which had fallen from Messrs. Mayall, Davies, and Williams; after which the proceedings were closed.

The Chairman announced that at the next meeting Mr. Highley would read a paper *On the Application of Photography to Educational Purposes*. Colonel Stuart Wortley had promised a communication, in February, *On the Production of Instantaneous Pictures on Large Plates;* and, in March, Mr. Mayall, as they had heard, had promised a paper on a kindred subject to that which had occupied their attention that evening.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

The first meeting for the season of this Society was held on the evening of the 9th inst., at 117, George-street, Edinburgh.

The walls of the room were decorated with about 250 of Macpherson's views of Rome. They were of large size, and comprised all the subjects of interest in the Eternal City. The members present inspected them with much interest. Generally speaking the pictures presented a somewhat hard appearance, and, in consequence, connoisseurs might be heard suggesting to each other that the albumen process must have been the one employed in the production of the pictures in question—an opinion which was afterwards confirmed by Mr. Macpherson stating that it was so. Some of the pictures bore slight marks of under-exposure throughout, while others had indications of a falling off of light towards the edges; and, although a few of the subjects showed "converging perpendiculars," yet it may be stated that, as a whole, they were successful, and the points of view well selected. In every case the skies were pure and white; and here, we think, the artist has made a mistake. A few light, fleecy clouds, even a tint, would relieve the monotony of these spotless white skies, and, it might be suggested, would help most wonderfully to make the pictures sell.

After due time had been allowed for the examination of the pictures, the chair was taken by

Sheriff Moir, who stated that he did so in the absence of the President, who was residing at a distance, but, he was happy to say, was in the enjoyment of good health. He congratulated the members upon the comparatively large attendance, which was much greater than they had had for a long time. Since they had last met, their Secretary, Mr. Adam, had seen it to be his duty to retire: he had found it impossible, without injury to his professional avocations, to discharge the duties of Secretary in a proper manner. There had been considerable difficulty in procuring a successor to him, but they had at last secured the services of Mr. T. B. Johnstone, a gentlemen who had been connected with the Society since its commencement, and he hoped that the members would render their new Secretary every assistance they possibly could, by furnishing papers for the meetings of the Society, and by the exhibition of new apparatus. Even although the latter might not be new in themselves, yet he doubted not some of them would possess novelty to many of the members, that would enable them to see all the latest improvements connected with their—should he say art, or science, or both—at any rate with their particular pursuit. The experience of the past year satisfied the Council that it would not be expedient to have an Exhibition for the present year. He hoped, however, that the Exhibition was not done away with altogether, but merely deferred for a year. He concluded by requesting Mr. Macpherson to explain any of his pictures which he might deem to possess more than general interest.

Mr. Macpherson stated that, if any member would ask for any information about particular pictures, he would be most happy to answer him. In reply to some questions, he gave interesting particulars relating to excavations which had recently been made in Rome and its vicinity. The photographic process he employed was the old albumen one, an account of which he believed he had given to the members several years ago. He had made some changes in his method of

working, but he had returned to it as he originally practised it. He had no secrets; whatever he could communicate was at their service, as it had hitherto been at the service of any who chose to obtain any information from him. He had made some modifications in his printing, which he would be happy to communicate at a subsequent meeting if it were desired. He might state, in the meantime, that he had reduced the strength of his silver from fifteen per cent. to five per cent., which was a saving of two-thirds; and when it was considered that he got from £30 to £35 a-year from his washings, they would agree with him in thinking per-centages were of some consequence. He exposed his pictures in the summer time, and for a distant view, about two minutes. Trees and such subjects usually took twenty minutes, and some interiors were exposed four hours. He believed albumen was as quick as collodion, if developed with pyrogallic acid instead of gallic acid. He preferred a mixture of both, and he had no doubt it would come to be used for portraits as well as views. The picture was there as soon as the light fell on it; all that was required was a suitable developer. The great strength of the albumen film rendered it possible to remove stains or fogging, for it would stand smart rubbing without the least fear of damaging the surface. On one occasion when a picture developed in a too flat and unsatisfactory manner, he dissolved it out with a strong solution of cyanide of potassium, and succeeded in again developing an excellent negative instead of the former one. He found that it did not answer to practise the albumen process during Lent. When he did so, he never met with his usual amount of success. He attributed this to the garbage of fish which the hens ate during Lent, and which affected the albumen so as to cause a want of success.

The Chairman said they were all much obliged to Mr. Macpherson for his interesting remarks, and he hoped he would soon fulfil his promise of sending them a paper embracing the particulars of his method of operating.

The Secretary then read a letter which he had received from Mr. Pouncy, in reply to a request that he would favour them with an examination of some of his more recent specimens of carbon printing. In his reply, Mr. Pouncy stated that if they would send him one or two negatives, soft and full of detail, he would be happy to send them prints from them.

An instrument called the "alethoscope" was exhibited. It is an Italian instrument for viewing large photographs, and consists of an oblong box, having a large lens (*a la* peep-show) at one end, a frame for holding pictures at the other, and an aperture in the top, and also one in the side furnished with a reflector, by means of which the picture is lighted. Some of the pictures were prepared with a view to dioramic effect, presenting a day-scene changing into a moonlight-scene according as it was viewed by reflected or transmitted light. The instrument is well made, but there is no novelty whatever in it.

The meeting was then adjourned.

EDINBURGH PHOTOGRAPHIC SOCIETY.

The annual meeting of this Society was held on the 3rd instant. The chair was occupied by George H. Slight, Esq., Vice-President.

After the minutes of the last meeting had been read, the Secretary read the following

ANNUAL REPORT.

At the termination of the second year of the Society's existence, your Council have to congratulate you on the continued prosperity which has attended its career. Although it has sustained a loss by the removal from town of five of its members, yet to compensate for this there has been an addition to the roll of 35 new members, and at present the numbers are steadily increasing.

There has been little possessing much novelty before the photographic world during the past year, but all such subjects as were deemed to possess any novel features have been brought under your notice at the ordinary meetings of the Society, either by papers read, or, as has more commonly been the case during this year, by having them introduced in a conversational manner.

The following comprise most of the subjects brought before the Society:—

On the Art of Viewing Binocular Pictures Without a Stereoscope. By Mr. Slight.

Elementary Optics. By Mr. Wason.

The Collodion Process—Theoretical. By Mr. Nicol.

The Practice of the Collodion Process. By Mr. Nicol and Mr. Horsburgh.

My First Photographic Trip to the Country, and What Befel Me. By a Member.

On Artistic Composition: its Application to Landscape, Portrait, and Figure Grouping. By Mr. Davies.

On Portable Tents. By Mr. Nicol.

On the Alleged Invention of the Stereoscope in the 16th Century. By J. T. Taylor.

Discussion on the Relative Advantages of the Wet and Dry Collodion Processes. By Messrs. Taylor and Davies.

On the Tannin Process.

On Toning Prints in Alum and Hyposulphite of Soda. By Mr. Bow.

On Photographic Varnishes.

Observations on the Recent Copyright Act. By Mr. Mure.

On Webster's New Method of Making Oxygen Gas; and *On Photolithography.*

In addition to the ordinary meetings, there have been three of the Society's popular meetings—two being lectures respectively on Teneriffe and Russia, by Professor Smyth, and one on "A Tour in Rhineland," by Mr. Mure. These were illustrated by means of photographs exhibited by the oxyhydrogen lantern; and, as the members had the privilege of bringing two or three friends with them, the hall, on each evening, has been well filled. The Council desire to tender their special thanks to these gentlemen for their kindness in coming forward on those occasions, and they take this opportunity of remarking that they have arranged for a few more evenings this season of a similar kind.

A feature during the past year has been a course of lessons in the practice of the art. These were conducted by Messrs. Nicol, Musgrave, Slight, Taylor, and Horsburgh; and to these gentlemen the Council tender their thanks.

You will observe, from the Treasurer's Report, that there are no actual surplus funds, but we are truly in a better pecuniary position; indeed, the state of the funds warranted the Council in procuring a complete first-class oxyhydrogen achromatic lantern and apparatus, for the exhibition of transparencies for popular evenings, and they hope to occupy an evening occasionally with the testing and exhibition of the works of the members in this branch of photographic art; and arrangements are being made for devoting an evening to the instruction of the members in this popular process.

We again congratulate the Society on its past success.

The report was unanimously adopted.

On the motion of Mr. Horsburgh, the thanks of the Society were tendered to the Office-bearers and Council for the excellent way in which they had managed the Society's affairs during the past year.

The following were elected as Office-bearers and Council for the ensuing year:—

President—J. D. Marwick.

Vice-Presidents—Robert H. Bow, C.E., and John Nicol.

Council—Adam Mossman, James Ramage, Andrew Mure, W. H. Davies, William Lyon, George H. Slight, R. S. Galloway, Frederick Hallard, Richard G. Muir, Alexander Hill, and Alexander M'Glashon.

Treasurer—Alexander T. Niven, C.A.

Auditor—F. H. Carter, C.A.

Secretary—J. T. Taylor.

After some further routine business the meeting was adjourned. The next meeting is to be held on Wednesday, the 17th instant, when a paper by Mr. Traquair, *On the Claims of Photography to be Recognised as a Fine Art*, will be read.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

The usual monthly meeting of this Association took place in the Scottish Exhibition Rooms, Glasgow, on Thursday evening, the 5th instant,—John Kibble, Esq., President, in the chair. There was a large muster of members.

Dr. Taylor was called upon to exhibit some dioramic effects produced on photographic pictures, and to give explanations of his apparatus.

Dr. Taylor, who was received with great applause, said:—The great object for which we have met to-night is that you may be shown this apparatus, because that to which I wish to direct your attention is a matter of sight rather than of hearing. In order to render it intelligible to you, and to enable you to suggest improvements upon this apparatus, I shall now read a description of it, which I have made as concise as possible.—He then read his descriptive paper entitled *Dioramic Effects Produced on Photographic Pictures.* [See page 465.]

When Dr. Taylor had concluded his paper, he invited the meeting to come forward and view the pictures and the *modus operandi* of the apparatus. The room having been darkened, those present, in parties of twelve, complied with the invitation. The pictures exhibited were three avenues near Inverary, and several scenes in the neighbourhood of Calcutta. What first struck the eye of the spectator was the remarkable beauty of the photographs, the rich colouring of the different objects, the natural aspect of the sky, and, above all, the glow of light which pervaded the whole of the scenes. In fact, hills, land, water, and trees seemed bathed in light, and gave the onlooker a most perfect idea of a sunny land. Gazing steadily the spectator perceived the clouds shifting with that regularity of movement characteristic of natural clouds. By-and-by the day drew to a close, when the sky exhibited all the variety and richness of a sky at sunset. Soon the pictures were seen as at night, with all the objects dimly visible; but immediately after, these were made distinctly apparent by the light of the moon, which suddenly appeared in the sky. The spectator by this time would naturally conclude that it was impossible to effect any more changes in the aspects of the scenery, but in this he was agreeably disappointed. All at once a forest scene was shown clothed in the garb of winter—every tree decked with snow only on such parts as it would be naturally driven by the snow storm. The effect which these seem to have upon the spectator is most wonderful. He gazes with intense delight at all he observes, and becomes so absorbed that he almost forgets he is looking upon a picture; and when he does reluctantly turn away, it is with a desire, and a half resolve, to visit one or more of the scenes which have given him so much pleasure.—All the members present having seen the pictures,

Dr. Taylor offered a few general remarks upon what they had witnessed. He said that every one who knew anything of practical painting, must be aware of the great difficulty there was to get paint to look, not like paint, but like light—in fact it was a principal study of the artist to give paint the appearance of light. They had just had an opportunity of judging how far he had been successful in that respect. The light which they had seen in those pictures—whatever they might think it to have been formed of—was still nothing else than that reflected from white and yellow paint. The finest weather was always procurable in those pictures. A gentleman, on seeing the picture of the Inverary avenue, was so struck with its beauty, that he made a pilgrimage to the spot. It was well worth all the trouble which would be taken to visit that spot, for it was one of the glories of Scotland.

Yet one might see that avenue twenty times before he could witness it in such a fine glow of light. How was it possible, then, to make the scene shine more brilliantly than even nature generally did? It was that power which these same transparencies gave, more than all others, of producing *tone*. In fact, there was more truth in those tones than one in a hundred artists could produce. Referring to the moonlight effects, Dr. Taylor said that when it was desired to produce those effects, the external lights were lowered, and the internal ones raised. The result of that action was that, when looking at the pictures, one range of clouds in them seemed to be crossing another, notwithstanding that the drum continued to revolve in one direction.

The CHAIRMAN proposed a vote of thanks to Dr. Taylor for the great trouble he had taken in setting up this apparatus, and for the treat, which was of no ordinary character, he had given them. It was indeed a great kindness shown to the Society by Dr. Taylor. The paper which that gentleman had read was both a lucid and an able one; and had been, he (the Chairman) was quite certain, listened to with great pleasure by all present.

Dr. TAYLOR, in acknowledging the compliment, said that no vote of thanks could be more acceptable to him than the one which had been made on the motion of the Chairman, who had assisted him greatly in working out the apparatus, and in many other ways in his scientific researches. But he could not exhibit the apparatus without mentioning the name of Mr. Macnab. It would not have been brought to its present state without him. He (Mr. Macnab) always resuscitated the matter whenever it lay dormant, and helped him in every way in providing negatives and giving assistance otherwise. Therefore if they gave a vote to him, he (Mr. Taylor) would propose that they should at least give a moiety of the thanks to Mr. Macnab.

Mr. BRACE thought that Mr. Macnab was also fairly entitled to a vote of thanks at their hands. He had been most assiduous and untiring in his efforts in connexion with the apparatus, and had assisted Dr. Taylor in exhibiting it to them that evening. He had much pleasure in moving a vote of thanks to Mr. Macnab.

Mr. MACNAB, in returning thanks for the honour which had been paid him, said that the whole of the mental work in connexion with the apparatus had been executed by Dr. Taylor, whilst he had the privilege of sharing in the mechanical part of the labour—in fact, he was the one that blew the bellows whilst the doctor played the organ.—[The last remark caused much merriment.]

After a question by Mr. Stuart had been replied to by Dr. Taylor, ten new members (one of whom was Dr. Taylor, as an honorary member) were elected in the usual manner; after which the proceedings terminated.

MANCHESTER PHOTOGRAPHIC SOCIETY.

AN ordinary meeting of the above Society was held at the rooms of the Literary and Philosophical Society, on Wednesday evening, the 3rd inst.,—John Parry, Esq., Vice-President, in the chair.

The HON. SECRETARY (Mr. Leslie J. Montefiore), on occupying, for the first time after his election, his official position, expressed his regret that he should be deprived of the valuable assistance of his colleague, Mr. B. Consterdine, who was unavoidably prevented from attending in consequence of indisposition.

The minutes of the last meeting were then read and confirmed. [That meeting, which took place on the 19th ultimo, was held for the purpose of making sundry alterations in the rules of the Society; and in accordance with a new rule then passed, two Honorary Secretaries were balloted for, when Mr. Benjamin Consterdine and Mr. Leslie J. Montefiore were declared duly elected.]

In introducing the subject of the quick dry processes selected for the evening's discussion, the Secretary regretted to inform the members that Mr. Sidebotham, who had undertaken to open the discussion, was suffering from a severe attack of influenza, and was consequently prevented from being present at the meeting; but, at the same time, he was happy to inform them that Mr. Sidebotham had not lost sight of his promise, and had addressed him a letter, which he would then read:—

SIR,—I shall be prevented being with you this evening, having a severe attack of influenza. I have not now time to write much on the subject of instantaneous photography on dry plates, but send a few memoranda and specimens, which will suffice to open the subject. I have been busy with experiments on rapid dry plates all the year, and hoped ere this to have laid the results and process before the Society; but domestic affliction stopped me in the midst of my labours, and I have not since resumed them. My experiments were directed to obtaining dry plates, made sensitive in a neutral bath. I found that ordinary collodio-albumen plates so treated were exceedingly rapid, but would not keep. My most rapid and promising process consisted in applying a double film of collodion, of two different qualities—the first coating washed and dried, and after the last a thin coating of hot gelatine. I send one or two negatives:—No. 1, a view of my telescope, prepared one day, exposed and developed the next; time of exposure, five seconds. No. 2, prepared the same time; kept two days; developed the third day; exposure four seconds, with fourteen inches focal lens.

You will see that No. 1 is bright, and No. 2 very much fogged at the edges. No. 3, stereoscopic, exposed with Dallmeyer's instantaneous shutter. This was only kept two days, and yet is foggy and spotty, and was very difficult to develop. The moving figures are taken without blur, and show that the process is quick enough, but otherwise unsatisfactory.

I quite think we shall in time obtain a quick process, giving us keeping qualities as well as rapidity of action; but I fear it will always be a very delicate process. I send a photograph of Mr. William Breese's—the *Sea Gull* picture—as a specimen of what we must aim at in dry plates; this, of course, is taken by the wet process. I also send you a few specimens for exhibition, illustrating how cloud negatives can be used to print into landscapes. The negatives were taken in Scotland and the clouds at Lytham. They were printed from my negatives by my friend Mr. Clarke. No. 5 is an instantaneous picture, on one of the dry plates kept two days; but it shows little, except how much we have yet to accomplish before we can equal No. 1 on a dry plate.

I am, yours very truly,

JOSEPH SIDEBOTHAM.

P.S.—I regret much my inability to be with you, as I know some of our members have matter of great interest to communicate on this subject.

The CHAIRMAN, after the reading of the above letter, trusted that the members present would give the meeting the benefit of any experiments they might have been making in the same direction.

Mr. WARDLEY remarked that the development with gallic acid appeared to be entirely discarded, and yet a great amount of development could be obtained with it, and that without the assistance of nitrate of silver, although silver was certainly necessary to bring up the intensity.

Mr. OFFER agreed that pictures could be developed without any silver being added to the developer; and at the same time expressed his opinion that brighter pictures were always obtained by a long exposure and short development than could be obtained by short exposure and long development.

Mr. WARDLEY appeared to differ from the above, having obtained equally bright pictures by both modes of operating.

The Secretary then exhibited a box of stereoscopic negatives, taken by himself on Dr. Hill Norris's ordinary dry plates, which had all been taken with an exposure of 30 seconds in a good light with Grubb's lenses ¼-in. aperture, and had been developed in the usual method, using very little silver in the developer, and calling in the assistance of hot water when the pictures appeared under-exposed. He (the Secretary) had been induced to exhibit these negatives, having been surprised constantly to hear that Dr. Hill Norris's plates required as long an exposure as collodio-albumen plates. He must say he had always failed when he gave them a long exposure, and thought the negatives then produced would go far to refute the idea that a long exposure was necessary.

Mr. WARDLEY was somewhat surprised that Dr. Hill Norris had never recommended the use of pyrogallic acid solution, without silver or retarding acid, as it was found to answer very well for his plates, and reduced considerably the time of exposure.

Mr. PETSCHLER begged to bring before the notice of the meeting some experiments made by a new member of the Society, and which, he thought, were most interesting, and handed round for the inspection of the members a collodion picture which had been entirely developed by Mr. Verity with the fumes of ammonia.

Mr. VERITY stated that he did not lay claim to anything new in the experiments in which he had been engaged, neither had he intended bringing them before the meeting, as they were still in a most unfinished state; but he might remark, since they had been referred to, that he had succeeded in developing dry collodion plates by the fumes of ammonia. As yet he had not succeeded in getting them sufficiently intense for printing without an after-development with pyrogallic acid and silver, which was easily applied, and the pictures could be fixed in the ordinary mode with hyposulphite of soda. Mr. Verity exhibited some specimens which he had taken the evening before, and which were considered of very great promise. The pictures were printed by superposition, by gas light, with an exposure of four minutes; but Mr. Verity had also developed pictures taken in the camera by the same means, and the pictures so taken always appeared to him to be brighter and more intense. A curious fact connected with this dry mode of development was that it appeared to require four minutes to completely develop the picture, and that if the development was prolonged beyond that period the picture gradually faded away: it did not become foggy but actually vanished, leaving a plain though discoloured plate. The ammoniacal gas seemed to have the same properties on the exposed collodion plate as the addition of liquid ammonia to a solution of nitrate of silver, which first threw down a precipitate of oxide of silver and then redissolved it when an excess was added; for it appeared as though the action of the gas first caused the image to appear by bringing about the formation of an oxide of silver which, on allowing an excess of the ammoniacal gas to act upon it, seems, so to speak, to redissolve the oxide formed.* He had also found that if a plate, after its development by ammoniacal gas, were exposed to the action of the vapour arising from acetic acid, the picture would gradually be dissolved, just as in the same way as though the action of the ammonia had been continued. By the use of the fumes of ammonia as a developer the time of exposure was considerably shortened. He had also tried liquid ammonia, as recommended by Major Russell, but invariably found that it was almost impossible to keep the film on the glass

The CHAIRMAN hoped that Mr. Verity would continue his most interesting and, he believed, valuable experiments, and would shortly lay before the Society more detailed accounts of his mode of operating.

Mr. VERITY said he should be most happy to do so, but thought he could not now do better than leave it to the other members to follow out the experiments which he had commenced.

Mr. WARDLEY thought the use of ammonia would throw a new light

* Our readers will remember that this fact was recently pointed out by Mr. Glover.—ED.

on the theory of the latent image on a collodion plate. It seemed to be quite uncertain whether it was due to molecular displacement or chemical change: from the fact of a plate being developed by the fumes of ammonia it would appear to be chemical. He for one would be pleased to see that pictures could be obtained without any free nitrate of silver. He might say that he had obtained pictures by the collodio-albumen process, when the plate (after the aceto-nitrate bath) had been washed in salt and water, and the picture had been developed with plain pyrogallic acid solution; but they were at the same time always deficient in intensity.

Mr. PETSCHLER said he thought they should do much better if instead of searching after new preservatives, new modes of preparation for the plate, &c., they turned their more exclusive attention to the developer, as he felt convinced that that would soonest bring us to that great goal of our ambition which we were all endeavouring to reach, viz., a really rapid and instantaneous dry process. He felt sanguine from experiments he had made that the impression of the image on the collodionised plate was instantaneous, and that it only required a more powerful developer than that with which they were at present acquainted to develop the latent image: he had in fact developed with the ordinary pyrogallic developer an instantaneous picture taken on a collodio-albumenised plate, but it had fogged before he could bring up the proper degree of intensity.

Mr. WARDLEY corroborated Mr. Petschler's remarks; and if his memory served him, he believed M. Le Gray, who was so celebrated for his waxed-paper pictures and for his studies of clouds and waves, was the first who expressed his opinion that the formation of the image on the collodion plate was instantaneous.

Mr. VERITY, in reply to a question, said he was not prepared at present to explain exactly his mode of preparing his dry plates, but they received a most thorough and complete washing; for, after being washed for some time in common water, they were left to soak half-an-hour in strong salt and water. One great advantage, he thought, would be derived from the use of the fumes of ammonia, viz., that they could easily develop their first picture with it, when in the field, and so judge of the quality of the light and the length of the exposure necessary, leaving the pictures taken afterwards to be developed on their return.

An animated discussion then ensued on the subject of Mr. Hislop's paper, read at the last meeting of the North London Photographic Association, in the course of which Mr. Wardley expressed his regret that Mr. Hislop had not given a formula for a collodion suitable for the process which he had adopted, rather than have recommended that of a particular maker. No one could be certain of obtaining collodion with the same properties constantly from the same maker: even the ether itself, from which it was manufactured, underwent great changes. A new sample was possessed of very different qualities to an old one; but if the old sample were redistilled, the good qualities previously possessed seemed to be renewed.

Mr. PETSCHLER asked if a substratum of albumen were used, as suggested by Mr. Hislop, whether an albuminate of silver would not be formed?

Mr. WARDLEY thought such would undoubtedly be the case, or the film would slip from the plate.

On the proposition of the CHAIRMAN, a vote of thanks was awarded by acclamation to Mr. Sidebotham for his very interesting communication, and for the animated discussion to which it had been a prelude. He (the Chairman) considered the thanks of the meeting were also due to Mr. Verity, and hoped that the Society would shortly be favoured with some more details from that gentleman.

The CHAIRMAN, whilst referring to the portfolios of the Exchange Club, said that he took some blame on himself for not having called the attention of the members at the last meeting to some very beautiful pictures which Mr. Wardley had left in them for exchange, and at the same time expressed a hope shortly to see the exchange of prints taking place more rapidly than had appeared to be the case hitherto.

The usual vote of thanks to the Chairman closed the proceedings.

PHOTOGRAPHIC SOCIETY OF MARSEILLES.

A MEETING of the above Society was held on the 8th ult.,—M. Gabriel, President, in the chair.

The CHAIRMAN, at the commencement of the meeting, thanked the directors of the Art Association, who had displayed such hospitality towards the Society. Thanks to this happy agreement, the Photographic Society would henceforth see the material condition of its existence always assured, and the elements of its prosperity increased. Independently of a place of meeting for the monthly assemblies and a Secretary's office, they were endowed with an elegant and comfortable location, where the members might assemble at all hours of the day to interchange ideas and the results of their experience and observation, and thus contribute to the progress of their art. Further, the laboratory of the Art Association would be placed at their disposal whenever they desired to perform any experiments connected either with the examination of new processes or in carrying out the operations of Committees. Finally, the Exhibition of the Society would be held in a large hall constructed for that special purpose; and the products of photography would compete with other productions of a different kind, which would appear in the course of the year, and receive whatever acknowledgment the Art Association might decree.—At the close of his address the Chairman, regarding the subject from a more general point of view, alluded to the immense service which the Art Association was destined to render to the cause of the arts in general, and also to letters and science, and expressed the thought that the Photographic Society should consider itself fortunate and be proud that it was not entirely a stranger to the movement by which it was established, and that the initiative, so to speak, originated with that Society, since it was due, as every one knew, to their intelligent and devoted Secretary, M. Leon Vidal.

These remarks were received with the warmest approbation. After the minutes of the last meeting were read and confirmed, the meeting proceeded to the admission of three new members, MM. Pascalio (director of the canal), Schmell, jun., and Allégré; and of Doctor Michel, of the Isle of Reunion, as corresponding member.

M. POITEVIN, among the correspondents, addressed to the Society a very remarkable notice,* on a new application of gelatine, considered as a vehicle for iodide of silver. The reading of the letter excited lively interest, and MM. Meynier, Brenmuller, and Tissot were specially deputed to investigate the matter experimentally, and report thereon to the Society.

Doctor MICHEL (Isle of Reunion), wrote to offer his testimony in favour of the modification of the Taupenôt process by the addition of tannin, as suggested by M. Vidal. He (Dr. Michel) having obtained such excellent results, was disposed to regard the process as very valuable for warm climates.

M. Laverdet, artist and photographer, of Paris, presented to the Society several very successful instantaneous proofs, among others one of a little girl, which was much admired. The pictures were accompanied by some samples of collodion with which they were taken, which M. Laverdet desired to submit for examination by the Society. That task was assumed by a Committee composed of MM. Tissot, Brenmuller and Meynier.

The reports of the various Committees were then read. That on M. Tissot's instantaneous shutter, opening from the centre, expressed to the author (M. Tissot) its congratulations on his having solved so interesting a problem by his invention, which was calculated to render real service to the photographic art. The instantaneous shutters hitherto used were for the most part very ingenious, but still left much to be desired. There was, however, very little to be done to render that of M. Tissot perfect.

The Committee appointed to examine the collodionised paper of M. Marion had not yet prepared its collective report; but M. Jacquemet, who had made some isolated trials, had much pleasure in testifying to the qualities of delicacy and rapidity which it possessed.

M. Meynier exhibited a salt distinguished by the name "sulphohydrocyanate of ammonia," of which he had made a recent application in photography to the fixing of positive and negative proofs. Like iodide of potassium, this salt possessed the very convenient property of dissolving the haloid salts of silver (such as the chlorides, iodides, and bromides) without having the toning properties of that salt. A further advantage attending its use was that the half-tones were not weakened, nor was the collodion film altered thereby. Finally, it was much preferable to hyposulphite of soda, as it did not, like the latter salt, precipitate a sulphur compound of silver with the nitrate of that base; nor did the presence of any acid cause the precipitation of sulphur, so that if the prints to be fixed contained traces of nitrate of silver or acid, no fears need be entertained on the score of sulphurisation. A careful washing of the print is, however, necessary, as when employing the usual fixing agents; but it does not require any special apparatus or appliances.

The PRESIDENT, after having thanked M. Meynier for his communication, added that if experience should confirm the results which he had announced, he would have achieved a conquest for which the science of photography would be lastingly indebted to him, since he would have contributed to preserve works the sole drawback to which was the uncertainty as to their lasting qualities.

A Committee—consisting of MM. Teissere, Congourdan, and Rey—was appointed to examine and report upon the qualities of the *sulphohydrocyanate* of ammonia.

M. VIDAL then proceeded to the analysis of the publications of the month, directing special attention to the excellent ideas on enlargement propounded by M. Claudet, and also to the theory of the action of light on iodide of silver by Mr. Thomas Sutton. A very interesting discussion thereupon occurred between the reporter and M. Jacquemet in connexion with that subject, referring especially to a phenomenon observed by the latter in working the tannin process.

[We append M. Jacquemet's account of this phenomenon.]

Before the closing of the meeting, some communications of a purely local interest were made by M. G. Pelissier, relative to the Exhibition and the Practical Course of Photography.

The nomination of the jury for the second Exhibition of Photography was postponed until the next meeting; and the meeting then adjourned.

[M. Jacquemet's account is as follows, as nearly as we can decipher his MS., which is almost illegible.]

To the EDITOR OF THE BRITISH JOURNAL OF PHOTOGRAPHY.

SIR,—A very interesting occurrence took place at the last meeting of the Photographic Society of Marseilles, which is calculated to throw new light on the still mysterious origin of the luminous impression. The following are the circumstances:—I showed several negatives on tannin

* It is needless to reproduce M. Poitevin's paper, the substance of it having already appeared in the letter from M. E. Lacan, our Paris Correspondent, published 15th ult.

plates: some had been developed in a short time (twenty-four hours) after exposure in the camera, the others at the end of about three weeks. The first possessed a degree of intensity which was quite remarkable, with the strongest contrasts — perhaps even exaggerated contrasts; the second, on the contrary, yielded an exceedingly weak image in those parts which should have been black, such as the skies, &c.: even after every attempt at intensification, nothing but a greyish feeble image was obtained—in fact, altogether unsuitable for printing from. All these plates had been prepared and exposed under precisely the same conditions, thus leading to the conclusion that tannin plates become weakened by keeping, and that the development ought not to be delayed beyond three or four days, and that it is even more prudent to perform this operation on the same day. I recollected, however, that M. Vidal, when first studying Major Russell's process, had arrived at an entirely different conclusion; and that, at one of the meetings of the Society, he had even developed some plates three months after exposure, which had yielded very vigorous and satisfactory pictures.

Immediately after the communication which I had made, M. Vidal offered an explanation of this anomalous phenomenon, which excited the liveliest interest among the auditory. "It was generally believed," he said, "that the phenomena connected with the luminous impression appertained more particularly to the department of physics rather than to that of chemistry, and the experiments the results of which had been placed before them, afforded new proof of this; for if there had been a combination, or even incipient reduction of the iodide of silver, this condition would have persisted, even if it had not increased by the lapse of time, but we see that the contrary is the case. Another cause must, therefore, be sought for, and we might with some justice assume that a certain molecular change was set up in the particles affected by light; however, I rather incline to the opinion that a certain portion of the actinic ray is absorbed by the film of iodide of silver, which thus becomes its temporary receptacle. The fact under consideration may be explained by either the one or the other of these hypotheses. In the first, the iodide of silver, in obedience to a general physical law, tends to return to its primary molecular condition in the same manner that wrought iron returns in the course of time from the fibrous to the crystalline or lamellar condition in which it first existed; and in the second, the luminous fluid (influence?) imprisoned, stored up in the pores of the collodion, escapes therefrom by degrees in the same manner that a heated body, left to itself, gradually loses its caloric. This change of condition takes place with more or less rapidity, according as the retaining film is more or less protected. Moreover, a vitreous or varnished substance ensures this to a certain extent. The plates which were not weakened after twenty days' keeping were preserved with only a small quantity of tannin (or ordinary three-per-cent. solution). Mine, however, which kept three months after exposure, were coated with a very much stronger solution (saturated). Such is the reason which explains the apparent contradiction between the two experiments."

It follows, then, from these explanations, that if, by certain means which will not fail to be studied, the faculty for development may be retained only for a greater or lesser time—or it should at length disappear altogether—it would be indeed a most curious experiment to expose again a plate which has been already fully impressed. I am convinced by intuition that the sensibility will not have been altered, and that the second image would appear alone in a clear and perfect manner.

I leave for your consideration, Mr. Editor, the question as to whether these experiments are calculated to throw any light on the origin of the phenomena connected with the luminous impression, and ask you to accept the assurance of my distinguished consideration.

(Signed) H. JACQUEMET.

AMERICAN PHOTOGRAPHICAL SOCIETY.*

This Society held its regular meeting for November, on Monday evening, 10th inst.,—Vice-President Pike in the chair.

Oscar G. Mason, of New York, was elected a member.

Vice-President Pike read the following paper on the appearance of *Acari* in the nitrate bath, and exhibited a micrograph of one of the *Acari*, magnified about five hundred diameters:—

The Acari in the Nitrate of Silver Bath used for Photographic Purposes.

In the month of August last I had occasion to make a series of examinations of the structure of the collodion films with the microscope, and for this purpose a nitrate of silver bath was prepared in the usual manner, employing one ounce nitrate of silver and eight ounces of distilled water. Twelve hours after it was made one drachm of alcohol was added, the whole filtered, and put into a clean glass bottle, and placed on a shelf in my operating-room ready for use. Two days afterwards I took from this bottle one ounce, by measure, which I placed in a small glass test tube, and tightly corked it, so that no dust or floating matter should enter it. This remained on my operating table for ten days before I had occasion to use it, as my samples of collodion were not ready till that time. I then prepared a small glass microscopic slide, which I coated with a single drop of collodion, and placed it in the nitrate of silver solution in the test-tube. In two or three minutes the slide was removed, and placed on the stage of a microscope, and to my surprise little animals were observed darting across the field in every direction. I at one concluded that they were species of *Acari*, introduced into the room with some specimens of natural history which had recently been placed on the table near this bath, and, they being so minute, had accidentally got into the liquid. Upon further examination, however, I found the surface of the bath covered with them. I immediately secured as many specimens on glass slides as I wanted, and then carefully filtered the solution, washing the test-tube perfectly clean, placing the filtered solution in the test-tube, and corking it tightly as before, using a new cork for the purpose, so as to be sure that nothing from the outside should enter the liquid. After this was completed I examined the solution with a powerful eye-glass, and was satisfied that it was free from all foreign substance, being bright and clear as spring water. I then placed it on a shelf, where it remained two weeks without being disturbed. At the expiration of that time I carefully took it from the shelf, and removed the cork, and, to my astonishment, the surface was nearly covered with them. They appeared to huddle together in the centre and on the surface of the liquid; and on my attempting to remove specimens to a glass slide with a minute-pointed instrument, they scattered in every direction, moving to the edge of the glass tube, and some of them going under the surface of the liquid. Their movements over the surface were very similar to the *Natantes*, or water-spiders—very quick, darting from one place to another when disturbed. They are also very pugnacious. I observed that when confined together in a microscopic glass well, they were always fighting, often times killing each other.

A general description of these little animals, perhaps, would be interesting. The body is very minute, oval, depressed, tapering toward the head, with antennæ one-third as long as the body. Legs, eight in number, the two front ones the longest, and all covered with long slender spines or hairs. Eyes, two, rather prominent, situate on the side of the head. The sides and back of the body are also covered with numerous spines or hairs, two very long ones being prominent on the anterior part of the body. Legs appear to consist of several joints, terminating in minute objects; antennæ also jointed; general colour, reddish-brown.

The genus to which this species belong are diffused throughout all parts of the world, and in all probability there are many species remaining yet undescribed. Their minuteness is extraordinary, many being scarcely visible without close inspection, and easily escaping the notice of the common observer. It is a remarkable phenomenon that any living animals can sustain life in a solution of nitrate of silver, and still more remarkable that these minute animals should generate and live in it. It is a question for the naturalist to solve; and I hope some one who is interested in the subject will investigate it more fully than I have done. Specimens are still living in the original bath, which I should be most happy to show any gentleman who wishes to see them

Mr. Fitz: Have you found *Acari* in a bath which did not contain alcohol?

Colonel Pike: I have not. I have made no search for them in such a bath.

Mr. Fitz: Are these like Cross's *Acari*, which he found in pure nitric acid?

Colonel Pike: I cannot say.

Professor Emerson, of Troy University (who has recently returned from Europe), said he had come to the meeting in order to execute a commission from Mr. Ross, the well known optician, of London. Mr. Ross presents to the American Photographical Society a model of Sutton's panoramic lens, and a set of specimens of panoramic prints; also, specimens of photographs by a new quick working lens designed for the *cartes-de-visite*.

The lens and the photographs were examined by the members with the liveliest interest. The lens was thought by some to be somewhat different from the few panoramic lenses imported a year or two since; and the panoramic views were considered to be far superior to anything of the kind yet shown in this city. The printing and toning of the photographs were admirable.

Colonel Pike: Have you any information about the toning of these prints?

Professor Emerson: I learned nothing new about toning while in Europe. As in this country, the alkaline gold toning seemed to be in general use. In England photography seems to be considered of more importance than here. The three photographic societies of London have over a thousand members, and the meetings are well attended. At the late meeting of the British Association, which I attended, photography was, as for many years past, one of the most prominent subjects of discussion; this year four or five papers were read on subjects pertaining to our art. I found myself forced to the conclusion that England is in advance of America in the practice of photography, even in portraiture. The exhibitions at the doorways are superior to ours. In landscape photography, which is almost a specialty of the English, there can be no doubt. In the shop windows there are always to be seen more landscapes than portraits. The cloud views are superb. Here we make none; but not for the reason which the *Photographic News* has given me credit for originating that we have no clouds in America. At the International Exhibition, however, the French deserve the palm; also the photographs of Albert, of Munich, are considered superior to those of any English exhibitor. English photographers are much interested in the progress of the art in America. Also I found that many of our photographers were known by name, and that they might find kind friends where they could little expect it.

* From The *American Journal of Photography*.

Mr. Barnard: Did you learn the prices at which photographs are sold in London—the *cartes-de-visite*, for example?

Professor Emerson: Prices, as in New York, vary much by quality of work, and the reputation of the artist. No doubt the range is greater in London. The price which Claudet receives for *cartes-de-visite* is about six dollars per dozen.

On the motion of Mr. Tillman, it was ordered that the thanks of the Society be tendered, through the Secretary, to Mr. Ross for his donations.

The Society also passed a resolution complimentary to Professor Emerson, for his politeness in executing his commission.

Mr. Johnson presented to the Society, for its museum, some articles of Daguerreotype apparatus used by Wolcott and Johnson in 1839-40. Among these was the iodine box, of precisely the plan still in use.

Mr. Fitz: I recognise these articles, and I made the camera.

Also with the apparatus were three unmounted meniscus lenses, two of which were symmetrical, and which were intended by Mr. Wolcott for what he termed the 90° camera. The outer curve of these lenses is a segment of over 90° of a sphere of about three inches diameter.

New Books.

Harmonious Colouring, in Oil, Water, and Photographic Colour, especially as applied to Photographs on Paper, Glass, and Silver Plate. By an Artist Photographer. *Fourth Edition.*

London: James Newman, Soho Square.

Having noticed in detail the previous editions of this work, it is needless for us to do more on the present occasion than draw attention to the new matter which has been introduced. In a chapter on "touching" and colouring enlarged photographs, the author rightly says—"Partly from some shortcomings in the method employed, and partly from inherent causes, these enlarged pictures, more than any other class of photography, require some aid from the touch of the artist." For this purpose crayons, black and white, and pastels in colours are recommended, and instructions given for their use, together with all needful information relative to the treatment of the photograph both before and after the application of the colour.

There is a chapter headed "A Few Words on Portraiture," containing many useful hints relative to the use, abuse, and avoidance of certain things, and which is calculated materially to assist an intelligent reader, deficient in artistic knowledge, in the acquirement of at least some rudimentary information on the subject. It must not be forgotten that the first step is always the most difficult. When an operator has discovered that he is not an artist, and tries to make himself one, it is only a question of time about his success; for, unless he is likely to succeed, he will never have made the discovery that there is any shortcoming in his knowledge of art.

Composition of the Photographic Image.—Mr. F. W. Hart is engaged upon experiments in this direction, upon which he has promised shortly to read a paper at one of the London Societies.

The Art Union of Glasgow.—*Weldon's Register* for this month, commenting upon the substitution of photographs for the usual engravings issued by the Association, characterises the plan as "a most judicious decision, provided only the directors have the sense to select great and not easily-accessible works to be photographed, rather than mediocre and accessible works to be engraved."

Carte-de-Visite Lenses.—We have been favoured by Mr. Thomas Ross with some excellent specimens of card portraits (executed by Messrs. Southwell Brothers), illustrative of the capabilities of his new quick-acting lenses, constructed specially for taking *cartes de visite*. The specimens before us are taken, we are informed, by aid of the No. 3 lens, and comprise portraits of the following actors and actresses:—Messrs. Paul Bedford, Toole, G. Vining, Miss Lydia Thompson, and Miss Clara W. Casse, photographed in several of their favourite characters, and mostly with elaborate accessories and scenery backgrounds. As photographs they are fine, delicate, and full of soft, pearly tones, with nicely-rounded modelage of the features, the sitters well posed, and though as works of art we should have preferred plainer backgrounds and a much smaller allowance of adjuncts, yet for the purpose in view—that of showing the capabilities of the lens—they are, as arranged, far better adapted; and we may add that it would be difficult to conceive of more complete success in the production of brilliant definition united with so close an approximation to flatness of field. We understand that the specimens exhibited at the last meeting of the North London Photographic Association, and set down by our reporter to the Messrs. Southwell, were duplicates of those before us, and were really exhibited by Mr. Ross. Having been prevented from attending the meeting by indisposition, we were unable, from personal knowledge, to correct our reporter's mistake.

Foreign Correspondence.

Paris, December 10th, 1862.

M. Anthony Thouret has been making a series of very interesting experiments on the comparative excellence of collodion with an admixture of bromide and collodion simply iodised. These experiments have led him to an absolute decision in favour of the latter. He has submitted to the attention of the French Society of Photography five *clichés*, composed each of four pictures of the same subject. All these negatives were produced under thoroughly identical conditions of light and manipulation. The collodion, at one per cent. of iodide of cadmium, was the same for all; but for the first *cliché* there was no bromide, for the second a quarter per cent., for the third a half, for the fourth three-quarters, and for the fifth one per cent. of bromide of cadmium. The time of exposure varied according to the quantity of bromide employed, and in the proportion of two, four, and six. Thus, with regard to rapidity, the superiority belongs to the collodion simply iodised, as also with regard to detail and vigour. This conclusion is diametrically opposed to the opinion hitherto entertained, especially in England, as to the action of the bromides on collodion. It is in contradiction to the principle on which the process recently published by Mr. Sutton is based. M. Thouret uses the following formula:—

Ether, at 65°	50 cubic centimetres.
Pure alcohol	50 „
Iodide of cadmium	1 gramme.
Cotton in powder	¾ or 1 gramme, according to solubility.

An amber tint must be given to this collodion by adding to it three drops of a solution of 5 grammes of iodine in 100 grammes of alcohol. M. Thouret's works show that in his hands this formula produces excellent results. Another formula—the principle of which is not new—is that at present employed by M. Jeanrenaud, whose fine landscapes at the London Exhibition have no doubt been admired by many of your readers. M. Jeanrenaud adds to an ordinary collodion five per cent. of a saturated solution of yellow amber in ether. His silver bath is at seven per cent., with an admixture of two per cent. of crystallisable acetic acid. He washes several times in water, and develops with the iron bath, or with pyrogallic acid. When he operates upon large glasses, he surrounds the borders with a collodionised coating of alcoholic or chloroform varnish. The addition of yellow amber to his collodion in the above proportions enables M. Jeanrenaud to keep his glasses for a month without their losing their sensitiveness. The duration of exposure is about double that necessary for operating on wet collodion, and half that required by glasses prepared with albumenised collodion.

A few days ago, at a small party at my house, which included some of our principal photographers, M. Jeanrenaud showed several landscapes obtained by this process. Their execution was so successful that every one asked for the process. So he described it, reminding us that yellow amber had already been recommended by M. Robiquet and M. Jouet, though in different proportions. On the same occasion, M. Disderi announced that he had just been negotiating with an American artist who had found out a means of producing positive pictures on the prepared canvas employed by painters. At M. Delessert's and also at Disderi's I have seen several specimens of this novelty, and must acknowledge that the result is most remarkable, the painter having only to terminate the sketch traced for him by photography, and being no longer inconvenienced by the nature of the substance he is painting upon, produces a work which has all the merit of photographic accuracy, and which at the same time has given him free scope for his talent. This is a new solution of the problem already solved by M. Claudet, but this time without escaping the photographic operation. Disderi offers his fellow-artists to receive their small negatives, to amplify them, and to have them painted by this system, so as to give them back a complete painting full-sized, for instance, in return for their *carte-de-visite cliché:* thus every one would be benefitted.

Mayer and Pierson's lawsuit against Thiebault, Belbeder, and Schwabbé—which made so much noise a few months back, because of its raising the question as to whether the law of 1793, for the protection of artistic property, applies to photography—has just been brought to a final close before the Supreme Court. The Court of Cassation has thrown out the demand for a new trial put forward by Thiebault, Belbeder, and Schwabbé, and has confirmed the judgment which condemns them. The importance of this decision is very evident. To gain their ends, the delinquents had

gone to all the most celebrated painters, sculptors, and engravers of Paris to obtain their signatures to a protest tending to prove that photography could not be considered as an art. If a certain number of the artists solicited signed the paper, I can mention two of the most celebrated who emphatically refused to do so: they were M. Léon Cogniet and M. Eugène Delacroix. Had photography but these two supporters among the masters of modern art it might still courageously maintain the struggle.

M. Léon Vidal, the Secretary of the Photographic Society of Marseilles, requests me to appeal to English photographers for the Photographic Exhibition which is being prepared in that city. All our artists have promised their co-operation: it is desirable that our foreign brethren should take a part also.

ERNEST LACAN.

Philadelphia, Nov. 17, 1862.

UNEXPECTED as was Professor Emerson's return to America, and much as we sympathised with him in the cause of his return, we could not but rejoice that we should have an opportunity afforded to us to receive from him, direct, his impressions of what he saw and heard during his short visit to England. On Saturday, the 8th instant, he agreed to meet your correspondent in Philadelphia. His visit was anticipated with pleasure, and some of our mutual photographic friends were invited to meet him at my house. I take the liberty of noticing this little *reunion*, as it gives me a chance of noting the American opinion of the specimens of English workmanship he brought with him. Professor Emerson arrived at my office rather early in the afternoon, and, at his request, we proceeded at once to Messrs. Broadbent and Co.'s rooms, that he might see Mr. Wenderoth's solar camera and judge of its efficiency from actual observation. After looking over a great many of the untouched proofs, he was forced to admit that he had never seen solar camera work equal to it anywhere. He was then shown the camera and its *modus operandi*, Mr. Wenderoth inviting him to visit it as often as he could during his stay in America, that he might become quite familiar with it and judge of its good qualities. He had afterwards explained to him the whole process of making new solar camera negatives from old intense negatives by the process described in my last letter, viz., of making positives on white enamelled glass, the intense negatives being backed by the same white glass. Here he saw composition pictures which had been in their frames for over *six years*, and was instructed in all the peculiarities of their manipulation.

Composition pictures, such as Rejlander's *Two Ways of Life* have not been executed in America. But precisely the same kind of picture—*i.e.* pictures made up from a great many different negatives—have been completed to satisfy the demands of persons ordering such pictures, just as was described in my last letter. Moran has produced many "artist studies"—as he calls them—or imitations of old paintings, in which the deep shadows are a prominent feature, mixed with grotesque attitude and drapery. Langenhien, among his early magic lantern slides, made some comic compositions by mixing up enlarged photographs of fleas with small pictures of men—one of his best being a portrait of himself, seated on a chair with his legs and arms thrown up in fright, and, with a carpenter's hatchet in his hand, defending himself against a huge flea much larger than himself, which is advancing at him on hind legs, while one of his front legs is almost touching the scared photographer. But enough of this: when Professor Emerson returns to England he can tell his own story about what he saw. During that pleasant afternoon he told me many interesting incidents of his visit to England. He described the appearance and manners of those we felt most interested in, and made me feel better acquainted with those to whom I have been so long time writing.

Upon our return home, Professor Emerson's portfolio was soon opened, and the first picture shown was the large picture taken by Mr. Sutton's panoramic lens, as improved by Mr. Thomas Ross, and also a large number of the pictures by the smaller instrument. These were examined with great interest, and very much admired—the landscapes especially. But all the gentlemen present seemed to concur in the opinion that a panoramic picture of a bridge, taken on the bridge, and showing both sides of it, did not render the perspective properly until the picture was curved and the eye placed near the picture about in the centre of the curvature. This defect, if it did really exist, was not evident in any of the landscape views, and nothing but praise was awarded to those productions. We were then shown one of Ross's quick-working card-picture lenses, and some cards were exhibited in proof of its capacity. The workmanship of the lens is very fine. However, in my own experience with other lenses, I have never deemed it right to place all the different stops in the same position between the two lenses, but have considered it necessary to move the stops nearer to the front lens the smaller they become.

Some weeks ago, Mr. H. T. Anthony kindly sent us for examination some landscape views taken by Mr. Dallmeyer's triplet lens, and said to have had only a few seconds' (five seconds, I think) exposure. They prepared us to admire the very fine specimens brought by Professor Emerson of views taken with this lens by Mr. Mayland, of Cambridge. Apart from the interest felt in the views themselves, as photographs they were greatly admired. At first their tone was objected to; but all seemed to admit that our taste for black tones was the result of fashion. Mr. Rejlander's composition picture, *The Two Ways of Life*, was examined with interest, but little was said in praise of it. His *Head of John the Baptist* was liked very much indeed, as were also some other's of his pictures. The stereographs of the interior of the International Exhibition were gone over again and again. They are very interesting, and far better pictures than we were led to suppose they would be when we heard of the troubles of the artists from clouds and crowds. Last, but not least, we were shown the glass positives by Mr. Breese, of Birmingham, to which had been awarded a medal in the Great Exhibition. They are as fine proofs as it is possible to conceive of. The slides, showing glass and silver ware, are wonderful, and excited the admiration of all who saw them. Mr. Breese's moonlight view was greatly admired, but all present at once said that the moon had been taken at one time, and the view at another. To look at his sea-views and cloud effects was a treat indeed. Professor Emerson also showed us some of the recent instantaneous (?) views of London, and explained the exact locality of each, thus adding to their interest.

Mr. Walker, the photographer of the Treasury Department of Washington, spent some hours with me a few weeks ago. He had been ordered to purchase an outfit for Daguerreotype, very much against his will. It is to be used in some matter connected with bank-note engraving. Speaking of the art in Washington, Mr. Walker says that there are a large number of amateurs there: among the number is the Minister from Brazil and his daughter. Mr. Titian R. Peale—who has charge of the class of fine arts in the Patent-office—is considered the leading amateur in Washington: his connexion with the art dates from its very commencement. His first pictures were all large, and his outfit for this class of work was very perfect; but of late he, like others of our amateurs, has confined his operations to stereographs. He works the tannin pure. As photography is classed among the *fine arts* in our patent office, it comes under his care, and he has collected for the patent office the most complete library of the art in America; being also in receipt of every journal on the subject published in the world, he is of course the best read operator in the country. Before General M. C. Meigs was so much engrossed in his military duties, and while he was in charge of the extension of the Capitol and Postoffice-buildings, he, too, was an enthusiastic amateur, but now he can do but little at it, Mr. Walker, in speaking of the copies of drawings made by himself, says that his method of cleaning glasses is to lay one, film side up, in the open air, spread over it a sheet of paper, wet this paper with nitric acid, and place another plate, film side down, on it, and so in succession make up a pile of glass and paper, wet with acid. He leaves them thus until needed, then washes and rubs off with alcohol. To keep on the film he has abandoned the preliminary coating of albumen, and merely rubs a piece of wet mouth-glue around the edge of the plate. The variety of work he has to do has suggested a mode of treating plain paper which saves him much trouble. He silvers his salted paper on a plain silver bath, very acid with nitric acid. This silvered paper will keep many days quite white, but just before using it he fumes it with ammonia, and then immediately prints on it. This plan he has followed for more than two years.

I may here mention that large dishes for toning and fixing, but more especially for fixing, can be made well and cheaply by taking any wooden box of suitable size, no matter how rough or leaky, and throwing over it a sheet of thin vulcanised rubber—pressing it down into the box, making a fold in each corner, then turning the surplus cloth over the edge of the box and tacking it on the outside. Such a box I had in use for several years, and some of the large establishments in this country use them, to the exclusion of all others, for holding fixing solutions.

Mr. George Mathiot, of Washington—the inventor of the celebrated photographic ware baths, and who has charge of the photographic operations, U.S. Coast Survey Office—writes under date Nov. 1, 1862, in reference to Harrison's new globe lens:—"I have

tested the globe lens, and find it far superior to all others in extent of field, power of definition, correctness of delineation, and rapidity of action. Compared with the single view lens, with small apertures, it has all the *sharpness* that characterises the small central parts of the field of that lens, but with that sharpness it has a large extent of well-defined field. It has a better definition and a wider field than the celebrated orthoscopic lens, and fills up what was wanted in that lens—freedom from distortion. The practical result of these superiorities is, that the globe lens works quicker than all others, thereby enabling the photographer to obtain good negatives in dull light, when but indifferent results, or even nothing at all, could be obtained with other lenses, and to take views and make duplicate copies of maps and drawings in large prints from large negatives, instead of numerously-patched-up copies made from small negatives, which has disfigured this part of the photographic art." These lenses are the subject of much argument on this side of the water; but, judging from the way in which amateurs are providing themselves with them, the argument is, like the handle of a pitcher, all on one side.

Hoping in my next to report a meeting of the Pennsylvanian Photographic Society, I am, with due regard,

COLEMAN SELLERS.

P.S. After closing my letter, and preparing it for the mail, a letter reached me from Mr. Henry T. Anthony, of New York, in which he says :—"The *fuming process* for albumen paper having at length transpired (as you have undoubtedly perceived), I take the first opportunity I have of advising you that you need no longer consider yourself under any obligation of secresy with regard to it, but are at liberty now to communicate your knowledge of it to THE BRITISH JOURNAL OF PHOTOGRAPHY." This opens up to me a large fund of information for interesting matter for my next letter, and matter too of the utmost importance. The little that has been written on the subject conveys no idea of the vast importance of this discovery. Without doubt, to Mr. Anthony is due all the credit of the introduction of the process into successful practice on a very large scale, and, in my own opinion, of its very first discovery. But more of this anon. C. S.

Philadelphia, October 2, 1862.

SIR,—Accompanying I send you a few photographs of my own production, according to a promise made to you by my friend Coleman Sellers: at the same time I take the liberty of saying a few words about them. As the enlargement of photography from small negatives occupies the attention of many of your artists at present, a few words from one who has had a practice of over six years in this branch might be welcome to some.

The first apparatus with which I practised was of French invention, without a condenser. The negative, backed with white paper, on which the rays of the sun were reflected from a mirror, was placed in front of a double combination portrait lens, behind which the sensitive paper was exposed at a distance, according to the size of the desired picture. The paper was iodised with iodide of potassium, and sensitised with nitrate of silver—thirty-five grains to the ounce—and developed with gallic acid and silver, and required an exposure of from fifteen to twenty minutes, giving a feeble, sunk-in picture.

Almost six years ago Mr. Woodward introduced his apparatus, of which I bought the first sample that was offered for sale; but soon I became convinced that by means of a reflector no strong effective prints could be obtained without an exposure of many hours for large pictures on ammonio-nitrate paper. I then set to work to find out a good developing process, in which I was so successful that I took pictures in rainy weather in five minutes, and with sunshine instantaneously. As long as I could work this process myself all was right, but when I had to get the work done by others all went wrong. I am, for myself, almost in favour of a developing process; for, firstly, no matter how excellent an apparatus is constructed for the use of the direct sunlight on ammonio-nitrate paper, an exposure of one or two hours will lessen the sharpness of the picture more or less; and, secondly, with the developing process I can obtain from a feeble negative a strong print of any size, which I cannot do with ammonio-nitrate paper, wherefore the density of the negative must be proportionate to the size of the picture, so that when I intend to enlarge to 3¼ by 4¼ feet from a 6 in. by 8 in. negative, the negative must be very feeble and transparent; and when I want to enlarge to 10 by 12 the negative must be almost strong enough for direct printing. But developing processes are not pleasant to work; they require too much care; therefore the ammonio-nitrate process is more popular. But to get powerful prints, the rays of the sun must be employed directly. Of this I soon became aware. I then constructed a house for two sets of apparatus, which was ten feet square inside, and twelve feet high, resting on four wheels, running on an iron railway, with machinery to turn it, which cost me about 500 dollars. This affair I have been using for four years with tolerable success; but in winter the snow would cover the rail sometimes to such an extent that I could not work, or a wheel would break, or slip off the rail, then the floor had settled, and the cock wheel would not catch, so that there was always some annoyance. In removing to our new locality I constructed another apparatus, which cost me only 80 dollars, but works admirably. With this the accompanying pictures have been produced—the smaller in twenty minutes, the larger in about forty to fifty minutes. This apparatus is placed inside the building under the roof, and Mr. C. Sellers promised to furnish a drawing of it for you. With this machine there is only one disadvantage; that is, it can only be worked in summer from half-past ten to two, and in winter from nine to three o'clock, in which time from four to six pictures of the size of 17 by 21 inches can be produced.

The best but somewhat more expensive plan for a normal apparatus is one which I originated, and, perhaps, in future might adopt, where the apparatus, which turns by machinery, is attached to the roof, and which can be arranged under the roof of any dwelling. I cut a circular opening in the roof of ten feet diameter, and put on the roof outside a cylinder—on the higher part of the roof one foot higher than the roof, on the lower part according to the fall of the roof. On this cylinder the roof is rested in such a manner that it can be turned by a simple mechanical arrangement, and on one of the rafters the apparatus is attached (in such a manner as to permit an easy up-and-down movement), projecting outside the roof, but enclosed in a box which opens in front and at top, but fits on the sides almost close to the camera. With this apparatus it is very easy to exclude the light from without, whereas in the one I have in use now this is very difficult to accomplish.

The most important part of a sola camera is the condenser, which must be of short focus, to be able to use at least 5 by 7 inch negatives. 22 inches or less length of focus is the most desirable: with long focus the negative becomes too much heated, and many break in consequence of it.

I could have sent you prints not quite so inky, but with less interesting subjects.

I see in the Journal statements in favour of and against the use of bromide in collodion, and, as I have experimented somewhat in the same direction, I take the liberty of giving you my results.

I have always worked with a neutral bath of forty grains of nitrate of silver to the ounce of water, and iodide of potassium and bromide of potassium in the collodion, but have found the same result with other iodides. As long as I have been acquainted with photography—that is seven years—I have been using collodion with iodide and bromide and an iron developer, and I think almost everybody else in America has used the same; and, when I read the articles in the different English journals, I really felt sorry to find you still using iodides alone and pyrogallic developer.

I have made the most careful experiments, and commenced with half-grain bromide, increasing to five grains, and always had the same results, that is, increased sensibility by the use of bromide and iron developer; and every operator I have ever met with says the same. I have found that with the same light, the same apparatus, the same chemicals. I obtained pictures in fully one-third less time by the use of bromide, and good strong negatives; and by increasing the quanity of bromide the time became shorter, but the negative weaker and too transparent, and would not sufficiently strengthen by redeveloping. I have found that five grains of iodide of ammonium and two grains of bromide of potassium give the best results with a forty-grain bath slightly acid with nitric acid. This formula is used by almost every operator in America.

In the same way an iron developer is an accelerator by fully one-third, almost one-half, in time of exposure. If I exposed a plate fifteen seconds with an iron developer, obtaining the best results, I had to expose twenty to twenty-five seconds with a pyrogallic developer, as by an exposure of fifteen seconds only the plates showed the same defects as those taken with iodide only—namely, too strong in the high lights, no middle tints, and no drapery (that is by the same length of exposure as with the bromide). The pictures of the ladies on horseback are taken with the above-mentioned collodion, and as quickly as I could open and shut the camera by hand. They were intended for the solar camera, but they are too strong (not redeveloped). Mr. Sellers will mention to you my process to produce solar-camera negatives of any strength from any kind of negative. I enclose some of our *cartes-de-visite*, and an albumen print varnished.

As I am a very poor English writer, you must excuse my mistakes; but I have no time to correct myself—dictionary in hand—therefore you must take the will for the deed, and remember that I had to learn the English language; and, as my business engages almost all my time, I have very little left for study.—I am, yours, &c.,

F. A. WENDEROTH.

[An attack of illness having precluded our attendance at any of the meetings of photographic societies since the receipt of the specimens kindly forwarded by Mr. Wenderoth—and to which we made allusion in our last—we postpone our comments thereon until we have had an opportunity of exhibiting them in public.—ED.]

INSTANTANEOUS DRY PROCESS.—We hear that Mr. England has made some very successful experiments in this direction, and, leisure permitting, will compete for the Marseilles prize, with every prospect of obtaining it.

Scraps and Fragments.

NEW PUBLICATIONS.—Mr. Ashmead, of Duke Street, London, has recently published a large series of stereographs from a rare and beautifully perfect collection of British birds. The photographs are by Mr. Sidney Smith.——From Athens we have a Greek biography of Prince Alfred, illustrated with a photograph—executed, we believe, by Abdullah Frères, of Constantinople—of its royal young hero. The work is issued by a political society to serve a political purpose.——Chapman and Hall announce a series of fifty photographs, executed by Thurston Thompson, published by authority of the Science and Art Department of South Kensington, and illustrative of the Italian Sculptures of the Middle Ages.

PURE CARBON.—Mr. George Gore has recently prepared this by an entirely new method. Into a red-hot clay crucible, by small portions at a time, an intimate mixture of one part of amorphous phosphorus with two parts of anhydrous carbonate of soda is projected. Save when necessarily raised for this purpose the cover of the crucible must be kept on, and in this cover a small hole must be pierced in order that the operator may see when the white flame, with which the vapour of the phosphorus will burn, subsides; because, until it does subside, no fresh portion must be added. The porous residue, when cold, is digested in water and thoroughly washed in a filter till no trace of the alkali is left, and what remains is pure carbon.

"THE LAST OF THE PHOTO.'S."—In the deserted eyrie devoted to the Exhibition of British Photography at the International Exhibition, South Kensington, one solitary frame of faded photographs —still remaining long after all others had been removed—was to be seen, a few days ago, with the following verses (after the late Thomas Moore) appended (supposed to have been written by the policeman in charge):—

Air—GROVES OF BLARNEY.

'Tis the last of the photo.'s,
  Left fading alone;
All its sulphured companions
  Are perish'd and gone;
No landscape or abbey,
  No portrait is nigh,
To reflect back its yellow
  Or jaundice the eye.

I'll not leave thee, thou lone one,
  To pine on the wall;
If thy owner don't fetch thee
  I'll steal frame and all.
Thus kindly I'll bear thee
  Adown the dark stairs,
With thy mates of the attic
  And Reformatory wares.

So soon may I follow
  Where faith is not broken,
And Commissioners "are not,"
  Nor medal, nor token.
When sweet views are withered,
  And *cartes* are all flown,
Oh! who would inhabit
  This garret alone?

RESIN PRINTING.—Mr. Charles A. Seely, in his last November number, says:—"The English journals are full of the discussion of a new (?) process of preparing paper with resins, as a substitute for albumen. The resins, with a suitable quantity of chloride, are dissolved in alcohol, and into this bath the paper is immersed; after drying the silvering and printing go on as usual. The editor of the *News* with some others were quite enthusiastic, at first. Albumen had had its day; but, later, on trial and on sober reflection, it appeared that there is nothing in it. The gum becomes dark—the surface does not preserve its integrity—the details of shadows are no better than on plain paper—and so on. We introduce the matter here chiefly in order to make a proper occasion to suggest to our neighbours, before they proclaim a discovery, that it would be well to find out if the discovery be of recent or ancient date, such an inquiry ,conscientiously made, concerning resinised paper might have saved our good neighbours from the awkward predicament in which we now find them. About two years ago, Mr. Snelling, our late esteemed brother editor, talked much about resinised paper, and showed prints on it, and imagined advantages; others did not see the advantages, and the subject was buried in oblivion till its resurrection by Mr. Cooper, of London. We do not charge Mr. Cooper with plagiarism; indeed we cannot, for his process is greatly less perfect then Mr. Snelling's. Mr. Snelling used gum dammar, which is less changed by light than any other gum, while Mr. Cooper seems to have used the gums which darken most promptly. Mr. Snelling used chloride of ammonium, while Mr. Cooper recommends the deliquescent chloride of cadmium."

HARRISON'S GLOBE LENSES.—Several of our correspondents have made inquiry of us as to where they can procure these lenses, so favourably received by American photographers; and we have suggested Mr. Atkinson, of Liverpool, as the most likely source through which to obtain them. We have just learned that he has received the first consignment of them for the English market, so we hope soon to hear from some of our constituents a report as to their quality in their hands. We must caution them not to expect that they will cover an angular extent of 90° upon a flat plate: we have valid reasons for knowing that they could not do so, and we may add that such an expectation would be most unreasonable. We may remark, also, that we fully expect they will be found to produce pictures entirely free from distortion of the image. Of definition and rapidity of action we have no data upon which to found an opinion as yet.

SOLAR CAMERA HINT.—Mr. Sidney Smith, the well-known photographer, in a recent conversation with an American operator, heard of a process by which paper can be so prepared for solar-camera work that, with an exposure of about one minute, the image, without further treatment, develops itself. Acting upon the hint so given, and, doubtless, with a due remembrance of Mr. Reade's early kid glove experiments, Mr. Smith immediately entered upon a series of experiments towards such an end, and almost at once discovered the clue which, he asserts, convinced him of the veracity of the transatlantic operator. The presence of a reducing agent previous to the application of the silver at once suggested itself as the direction which his experiments should take; and he has promised to communicate results when time will permit him to carry his experiments to a thorough and permanent conclusion. The value of such a discovery will be very readily appreciated by those who use the solar camera in this country, more especially in London.

Correspondence.

CORRIGENDA.

To the EDITOR.

SIR,—There are two printed errors of importance in my paper entitled *Some Additional Note on Plain Washed Collodion for Dry Plates*, inserted in the number of your Journal just received.

The exposure is from "one to five minutes, with a *four-and-a-half-inch* focus lens," instead of a six-inch.

The developer is six grains of pyrogallic acid to *four* grains of citric acid, instead of six.

In the report of the discussion, Mr. Simpson's words are transposed so as to alter the sense. What he did say was, that the credit of a process was due to those who successfully worked it out, although others might have proposed it before, but failed in its practice.—I am yours, &c.,

London, December 1, 1862. W. HISLOP.

A FAULTY NITRATE BATH.

To the EDITOR.

SIR,—In the pages of THE BRITISH JOURNAL OF PHOTOGRAPHY, which I regularly receive, I see so many assurances of your willingness to assist correspondents in any of their difficulties, that I take hope the like charity may be extended to me in my present *fix*, as I am quite a novice in the art.

The last time I went up country, I had my camera, &c., with me (intending to work with the wet collodion process), but I found I could not get a single picture, the plate showing nothing but one deep mass of *red*, with only a very faint and almost invisible outline of the subject. The first thought that struck me was that it might perhaps be red solarisation, as the sun was shining pretty strongly; so I changed the subject and exposure, putting in a smaller diaphragm, but still the same result. Then I thought that perhaps alkalinity might be the cause, so I added acetic acid: no better. I then changed the sample of collodion: no improvement. I then developed with pyrogallic acid (as my usual and best working developer is iron): still red. I then thought it might be some action of light in my tent, and developed and fixed without exposure, *but it came out clear*. I agitated my bath solution with kaolin: not a bit better. So I gave it up, and after a great deal of trouble in getting distilled water (as all the spring water in the neighbourhood was strongly impregnated with sulphur, being in the near vicinity of an active volcano), I made a new silver bath, and found no difficulty in getting pictures, with great clearness, though of course a little spotted. I thought at one time it might have been attributable to my having filtered the bath, before starting, through *red* blotting paper (my stock of filter-paper being used up, and it is not always possible to get any in this out-of-the-way place at a moment's notice); but, on asking a fellow-amateur if he had ever experienced the same thing, he assured me he had, even though he had used proper filter-paper.

As it would be exceedingly annoying were such to happen again, and as I am unable to find any solution of the mystery in Hardwich's *Manual*, I have taken the liberty of placing the matter before you, in the hope that cause and cure may, though unknown to me, be exceedingly simple,

and that, excusing the present trouble I am giving you, you may be able to make known the same to—Your's, &c.,

Batavia, 13*th October*, 1862. A JAVA SPARROW.

[We have little doubt that the defect of which you complain arose from the presence of objectionable organic matter in the nitrate of silver solution: rendering the same alkaline by the addition of ammonia, and exposing to the direct solar rays, would probably have remedied the evil. It is not impossible that the cautious addition of per-manganate of potash (Condy's patent fluid) might have accomplished your object perfectly by oxidation of the organic matter. This agent would most likely render the water in your neighbourhood available for photographic purposes.—Ed.]

WEIGH THE SILLER.

To the Editor.

Maister Editor,—Mony thanks for the honour ye did me by gie'n my bit letter a corner o' the Journal, an' for informin' me that nitrate o' siller is sauld by avoirdupoise weight. I hae taen a note o't, an' will nae trouble ye again on that head.

But aloo'in that I was only entitled to get 437½ grains to the ounce, the result o' my *five weighins* conclusively pruvs, as our minister wad say, that I was what ye Londoners ca' "done" by the shopkeeper loon, an' I think I wull na be gau'in far oot o' my place in gie'n my brither airtists a hint to weigh their siller, an' see that they are not "*done*" in like your muckle obleeged servant, LOCHABER.

P.S.—If ye are tae gie' your subscribers, this year, a Christmas gift in shape o' a bonny wee almanack, like the ane ye presented us wi' last year (an' it was, like my sweetheart Tibby, "better far than bonny"), perhaps ye wad tak a hint frae the gentleman wha is aye asking in *The Times*—"Do you bruise your oats?" by printin on the tap o' ilka page—"Do you weigh your siller?" It micht be usefu'! Hech! the postcrip is aboot as lang as the letter! L.

[See Mr. Dawson's article.—Ed.]

BLISTERS ON DRY PLATES.

To the Editor.

Sir,—I have been attempting to develop tannin dry plates by the hot water process, and would succeed if I could prevent small blisters (generally termed "measles," I believe) getting on to the plate near the close of the development. If you can assist me I shall feel much obliged.

The plates are prepared with fifteen grains of tannin and fifteen grains of honey to the ounce of distilled water. I place them in a bath (previous development) of hot water, at a temperature of 90°, and allow them to remain seven minutes, then develop with pyrogallic, citric, and silver.

Will you also be good enough to say, through the medium of your Journal, if there are to be any marks affixed to paintings, engravings, and photographs, showing them to have been entered or not at Stationers' Hall, or how it is to be known whether they are copyright?—I am, yours, &c., MEASLES.

Jedburgh, December 8, 1862.

[Our correspondent is quite wrong in his diagnosis. Photographic measles is a complaint to which paper positives are liable: negatives are not so, and the symptoms are totally different to those described, which are small blisters. We apprehend that Major Russell's remedy for lossening of the film would be applicable here also. See letter from that gentleman, p. 439. Works of art, on registration, are not stamped or marked in any way; but as the copyright would exist in all works of art except registration be neglected, it is the duty of the public to regard *all* works of art as copyright except such as they may have ascertained, after due inquiry at Stationers' Hall, to be unprotected.—Ed.]

CLOUDS ON DRY PLATES.

To the Editor.

[In our last a letter under the initials "J. L. P." appeared, in which allusion was made to some excellent stereographs which accompanied it. In some of them the clouds were beautifully depicted, and we have sought for information relative to the details of the manipulation and process adopted by our correspondent: in consequence of our application we have been favoured with the following letter]:—

Sir,—As to my manipulation, it is so simple that I know not what to say of it. Your readers will just say—"Why we knew that long ago;" but here it is:—

Bath 40 grains, slightly acid (glacial). Albumen 1 egg (white of), 1½ oz. water, 12 drops liq. ammonia. Shake well in a bottle (8 oz. bottle) till all frothed; settle and filter. Coat with Keene's dry-plate collodion; remain in bath about three minutes, drain, wash in succession in two well baths, fresh water each time. Drain and flow 1½ drachm albumen along the upper edge of the plate, pouring on so as to make one regular wave towards the lower edge and corner, allowing a little to fall off at the corner, and washing the rest well round the plate. Drain and place in a washing tray. Shake the tray briskly, with a mill-hopper kind of motion, say half a minute; repeat three times, with fresh water; then set the plate up to drain on blotting paper, with a strip of glass under, to keep from contact with the shelf. When the film is dry place into a drying box. This is the whole affair. My own idea is that no process is more simple and reliable than the Fothergill, but it takes years to master it; and if there is any secret in the mode of attaining this, it is simply care, neat handling, *cleanliness*, and thoughtful observation. I know almost nothing of chemistry: any glimmerings I have are such as make me love it much. It was mechanical propensities which first glided me into photography. Now, I know not whether the one pursuit or the other is the more fascinating. When I get home at night and up into my *garret* (do you know what a garret is?), get on my apron and turn the gas under my glue-pot—could you then open the camera upon me, I promise you would have the photograph of one pleased face. Perhaps one help to me is that I can make every appliance I want, and exactly the way it is wanted.—I am yours, &c., J. L. P.

ANSWERS TO CORRESPONDENTS.

*** A large number of original articles in type are unavoidably postponed till our next.

R. E. M.—L. C.—Received with thanks.

A. K.—Received and "made a note of."

Reuben.—See reply to "A Java Sparrow."

O. C.—Throw it away: it is not worth anything.

Fix.—Mr. ——— says No! Shall we push the question further?

G.—We have not heard any such report as you name, and have no doubt of its being untrue.

Puzzled.—Evidently your bath of nitrate of silver has been too much reduced by use: make it stronger.

Lotus.—For cards on which to mount card portraits and stereographs, you have only to consult our advertising columns to ascertain where to procure them.

Homo.—The principle is radically wrong, and no modification of it can be good. You may make it less obnoxious, but that is all. We cannot insert such advice.

Credo.—We are assured of the truth of the charge made, or we should not have inserted "Lochaber's" letter. In your case the offence, though existing, does not seem to have been quite so gross in extent.

Tintoretto.—You had better procure Mr. Wall's *Manual of Photographic Colouring*, or take lessons of the author. Personlly we are not acquainted with the art of colouring, and cannot aid you in solving your problem.

S.—The plan you have been advised to adopt for saving your otherwise waste silver answers very well. It will be thrown down as a sulphide of that metal, and must be afterwards reduced by deflagration in a hot crucible by aid of nitrate and carbonate of potash.

Another Amateur.—You will find particulars in a letter signed "J. L. P." The results are really excellent in the abstract—not merely excellent for an amateur. We never intend such a distinction without expressing it. See also communication from Mr. Keene in the current number.

Rara Avis.—We find some others besides yourself preferring Daguerreotypes to paper proofs; but very few, and they are generally old practitioners of the art, who remain constant to their first love. Honestly we admit that we do not like them at all, and never did; but we never practised that branch of photography.

Hobble.—Your note arrived too late for us to reply in our last, indeed not until we were actually "at press." We should judge from the appearance of your proof that you had failed to wash away the surplus nitrate of silver before submitting it to the action of the toning bath, or else that the toning operation had been performed in too strong daylight. Either cause would account for the defect.

J. Seacole.—The wood of which most of the cameras made in France are constructed is walnut-wood, a kind well adapted for those intended for portraiture, being hard and not generally liable to warp; but for cameras for field work it is decidedly too heavy. There is, however, a kind known as black walnut-wood, imported from Canada, that might be substituted with advantage in this country.

W. Cornish, Jun.—1. White, hard, carriage varnish, diluted with an equal bulk of alcohol, has been well reported of by some operators; and, *prima facie*, it would appear to be probable that it should answer the end in view, for few things have to bear more exposure to sun and alterations of weather than the panels of carriages.—2. A general vote of thanks was accorded for the very acceptable present so liberally bestowed by Mr. St. George.

O. I. O.—We do not recommend, in preference, a gas-stove for heating your operating-room, especially if you are a professional photographer. Should this latter be the case, and you can afford the present outlay, there is, in our opinion, nothing to equal the Arnott stove, by which the almost absolute evenness of temperature may be secured at a moderate working cost, and, what is of material importance to you, all dust is avoided, the charge of coal for twenty-four hours being capable of arrangement at a single operation. We have seen the working of such a stove in a sick room for three or four months, without the fire ever going out, or the temperature varying more than one degree from a fixed standard.

Excelsior.—The *Manual* by C. Jabez Hughes, or that by J. B. Hockin, will answer your purpose well. You have fallen into the common error in supposing that one set of apparatus is adapted for several different purposes. Do not try too much at once: start with stereoscopic landscapes, *or else* with card-portraits alone, and do not try any other branch till you are tolerably familiar with the one you select. We cannot undertake to recommend any particular firm, but must refer you to our advertising columns. We will add but one word of caution: remember that the lowest-priced article is not always the cheapest. If you are in doubt which sort, of several, to select, and will send us a numbered list, we will endeavour to indicate that which we think will meet your requirements best.

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